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Photography.

'*The British Journal Almanac* makes its first appearance under the able editorship of Thomas Bedding, F.R.P.S., and many of its old readers will scan it the more narrowly on that account. The book will bear such inspection, for though it shows considerable changes, they are judicious, and in the right direction. The miscellaneous articles occupy rather less space than before, but the editorial contributions, records of the year's progress, &c., are correspondingly longer. This, in a year which has seen the development of radiography, kinetography, and acetylene, as well as a great advance in the use of anastigmatic lenses, is decidedly an advantage.'—*The Photogram.*

'*The British Journal Almanac for* 1897. Obesity is a disease in man, but an admirable quality in almanacs, and so we are glad to see the familiar yellow-backed annual, if anything, looking fatter and healthier than ever. In 1871, as far back as our set goes, it was less than half the size of the present issue. The contents are as good as ever, the introductory summary and the editor's article on recent lenses being particularly valuable for reference.'—*Practical Photographer.*

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EX CATHEDRÂ.

These lines are being written within a very few hours of the time when people take the opportunity of making good resolutions and coming to the more or less desirable determination of turning over a new leaf. It is an old saying that, at midnight on the 31st of each December, if the operation of turning over the new leaf were accompanied by the sound usually characterising the material action, the world would be filled with the noise of a tremendous rustling of paper. What a merciful thing it is that those new leaves do not rustle, and that most of us, therefore, are spared the subsequent reproaches of our neighbours, as well as of our consciences, that we rustled our leaves in vain!

* * *

With this, the first number of the new year, The British Journal of Photography turns over a new leaf, in the simple sense that it appears before its readers in a changed and, it is thought, improved aspect. What is technically known as the "make-up" of the paper has been rearranged, and throughout its pages it will be observed that several alterations of a minor character have been introduced. It is believed that those alterations will meet with the approval, as well as consult the convenience, of our readers, who in the course of two or three weeks will have opportunities of becoming acquainted with other changes in detail which it is proposed to adopt.

* * *

As regards the future of the Journal, it is perhaps needless to state that it will be the aim of those in whose hands its destinies are placed to maintain it in the proud and honourable position it has so long occupied. The various able writers who for many years past have well and loyally contributed to and supported The British Journal of Photography under past occupants of the editorial chair will continue their valued services under the present Editor-in-Chief, who has also the satisfaction of stating that he has secured the co-operation of several accomplished experimental and practical photographers of the younger school, who will supply just so much of what is called the "new blood" that it may be found desirable to introduce into these columns.

* * *

For the rest, while the Journal will follow the lines to which its lengthy and successful career and the confidence and good opinion of the photographic public at home and abroad have given the stamp of approbation, it is our intention to make use of and develop certain new features which have been chosen with the view of augmenting its value. Abiding by precedent, however, we refrain from publishing a programme. We are, indeed, content to state that it is our design to omit no effort for assuring to The British Journal of Photography a continuance of the prestige and influence it has so long possessed, that all departments of photographic theory and practice will be found fully dealt with in its columns, that the artistic aspects of photography will, as hitherto, be discussed by representative writers, that the trade, the manufacturers, and professional photographers will continue to find in the Journal an earnest and unwearied mouthpiece—in short, that everything which tends to promote photographic advance and progress will have the fullest and earliest recognition in its pages.

* * *

Innumerable readers and friends of the Journal will also, doubtless, be interested to know that the old editorial office at York-street, which has long been looked upon as the one spot

to which so very many of those, from abroad as well as at home, who are interested in photography sooner or later resort, has been swept and garnished, and by-and-by may not improbably present a quite palatial appearance. To that office all friends of the JOURNAL and those to whom we may possibly be of help or assistance in photographic matters will always, as in past times, be cordially welcomed.

* * *

FINALLY we pass on to remark that it is the intention to make this weekly *causerie* the opportunity of indulging in an informal—possibly a pleasant, and, it is to be hoped, instructive—gossip with the reader on such topics of interest as may seem profitable to select for discussion or comment here. The only remaining observation called for is, that whatever is said in this part of the JOURNAL appears under the same sense of responsibility as that which accompanies the remainder of its contents.

* * *

WHILE the Christmas atmosphere still to a great extent lingers with us, it may be worth while noting that photography appears to be responsible in a larger degree than in previous years for the production of portions at least of the Christmas and New-year's cards that have been so prolific during the last few days. The cheapness, convenience, and adaptability of the collotype process has at last been thoroughly grasped by the wholesale houses, and an enormous number of such cards have been distributed. In the collection of which we were the fortunate recipients, bromides and platinotypes also figured. For the last two kinds there is still scope for business which, we fear, many a photographer in a small way neglects. If anything is likely to drive the old-fashioned coloured product into complete oblivion, it is photography in some form or other. Have photographers yet grasped that fact?

* * *

SILVER prints—that is, surfaced prints—as Christmas and New-year's cards seem, on the other hand, to be going out of vogue. We received one such, however. It was a portrait of ourselves, taken in this office by Mr. W. Crooke, of Edinburgh, who used a Pocket Kodak, and gave an exposure of twenty seconds. The result was capital. The Pocket Kodak has, apparently, had an enormous run, which will probably not be exhausted during the approaching season. The examples of interior and portrait work, which Mr. Crooke showed that he had done with it, do the little instrument and Mr. Crooke great credit.

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MR. ALFRED MASKELL, who has constituted himself the advocate of the Artigue non-transfer method of carbon printing, writes with reference to an article on the subject that was recently published, and says, "I note the leader which says that 'if the transfer operations could be dispensed with, and the image developed—*provided the gradation of tones were perfect*—direct on the pigmented paper, the carbon would be the simplest and most easy of manipulation of all the printing methods.' With Artigue's or similar methods the transfer *is* dispensed with, the gradation of tones *is* perfect, and the image is as sharp as by any other process, and the image is not reversed as regards right and left. The small picture which I showed you, and which was done by Pringle, and others which Sinclair made on the Artigue paper with the greatest ease on his first trial, are very good examples of the incorrectness of the above statements."

* * *

THE last Exhibition of the Salon contained, as Mr. Maskell has already pointed out, many examples of prints by the Artigue process, to which, on the ground of technique, no objection could be taken; while as regards the particular print to which he refers, it struck us as so good of its kind as to be fairly comparable with ordinary carbon or platinum prints. We have not tried the Artigue paper, but there seems no obvious reason why it should not be popular, at any rate among amateur carbon printers. The specimens shown at the Dublin Convention elicited at the time warm praise from the late Editor of the JOURNAL.

* * *

UNDETERRED by the fate of most dramatists who take photography as a base upon which to build a portion of their plots, two gentlemen lately essayed success where so many have failed, and, like poor Mr. Jerome the other day, came to grief. These gentlemen called their piece *An Unsanctified Garment*, which article of attire, according to a contemporary, was "a short dress worn at a fancy ball at Covent-garden by my Lady Arlington, who, thinking she would like to be photographed in it, forwards it to the portrait-maker, Mr. Hammond, who, judging by his appearance and his surroundings, is the sort of photographer who does business in the summer time on Ramsgate Sands. Of course she makes an appointment, but she does not keep it.

* * *

"LORD ARLINGTON looks in while Mrs. Hammond is masquerading in the costume, and persuades her to be 'taken' with him. When he is gone, the giddy Mrs. McDouglas, wife of one of the strait-laced elders at Mr. McMuggin's tabernacle, appears on the scene. She, too, dons the 'unsanctified garment,' and she, too, is 'taken.' She is 'taken' more than she wanted to be. She bargains with Hammond to take one picture only, and then to destroy the negative; but Hammond's assistant, who has a grudge against the over-pious Solomon McDouglas, uses the camera on her while she is pinning up her skirts and exposing a well-developed calf, including also in the picture Lord Arlington, who has suddenly returned for a jewel he has left behind. The assistant, having developed his plates, puts the results in his master's window, and then Solomon McDouglas's troubles begin," &c.

* * *

THIS kind of thing was put forward as the pivot upon which a "serious" piece of dramatic work was supposed to turn. The authors entertain curious notions as to the way in which the business of photographic studios is conducted.

* * *

WE conclude as we should have commenced, and that is by wishing all readers of the JOURNAL A Happy and Prosperous New Year.

THE FUTURE OF COLLODION AND GELATINE IN PHOTOGRAPHY.

IT is now just about a decade and a half since gelatino-bromide emulsion plates superseded wet collodion for general com-

mercial work, and dry collodion amongst amateurs. Ever since that period attempts have been made by experimentalists to produce, with collodion, plates as sensitive as with gelatine, and, from time to time, it has been alleged that some one has accomplished that end. It will not, therefore, be amiss, at the commencement of the year 1896, to consider what would be the prospects of success, commercially, of collodion dry—or even wet—plates, provided they could be produced of the same rapidity as that of the present brands of gelatine plates. This it may be the more desirable to do, inasmuch as we have heard several rumours during the past year or two, particularly from the Continent, that the thing is *un fait accompli*, but that is all; results up to the present have not been forthcoming.

The fact is, that, because a thing may be desirable at one period, it does not follow that it will be so at another—or at least to the same degree—may be the case with the subject now under consideration. There is no question that, when gelatine displaced collodion for general work, it did it solely by reason of its superior sensitiveness, and that alone. The qualities and the character of the negatives were not liked, indeed were strongly condemned, for a time, by those who, perforce, used them simply on account of their enhanced rapidity over the wet-plate process. There is no question that if at the time referred to collodion could have been made to yield plates equalling the rapidity of gelatine, the latter would never have assumed the proportions it has in photography.

Collodion dies hard, and its makers tell us that there is still a constant and steady demand for it in various directions. In photo-mechanical work it is yet the favourite process for the negatives. Although specially prepared plates are being employed by some, many of the leading houses still adhere to the old process, and they affirm that it suits them best. When enlargements are made through the medium of a large negative, as in the carbon and platinotype processes, wet collodion is almost universally employed. On the Continent most of the art-reproduction work is done by collodion. The majority of the commercial lantern slides are still made on wet collodion; and not an inconsiderable proportion of the best of those by amateurs on collodion emulsion. Seeing all this, it is really worth considering whether, supposing it were possible to produce collodion plates equal in rapidity to gelatine, they would now stand any chance of superseding it. The answer is difficult, because the conditions are so widely different from what they were when the former process ousted the latter.

At the present time the standard of negatives has changed, and the old wet-plate character—the ideal of the older workers—is no longer desired; indeed, it would be decried by the majority of modern workers. Again, the present generation of photographers, as a rule, knows nothing about the manipulation of collodion, either by acid or alkaline development. Moreover, the tenderness of the collodion film, as compared with that of gelatine, would give trouble to many, as would also the general delicacy of the manipulations from first to last. Gelatine plates will bear a deal of rough treatment, while collodion must be tenderly handled. It is a little doubtful even if some of the older workers would again take kindly to collodion. Taking all these facts into consideration, one cannot but arrive at the conclusion that, if collodion could be rendered as sensitive as gelatine for negative work, it would have an up-hill journey for some time before it would oust gelatine from the field for that purpose. The character of the negatives it yields—the standard of fifteen years ago—would not assist it much in the eyes of modern workers, except those connected with the photo-mechanical processes.

These remarks, be it understood, are not made to deter experimentalists, but rather to stimulate them, for, as every one knows, the gelatine process has its shortcomings, and any other that would avoid them would be a desideratum. One thing, by way of encouragement, may be mentioned, which is, that collodion lends itself better to orthochromatic photography than does gelatine. Some orthochromatic collodion plates give far better colour renderings, without a colour screen, than do gelatine ones.

Turning now from negatives to prints, one may as well first glance at the future prospects of gelatine and collodion for printing purposes. During the last few years gelatine has largely displaced albumen for printing-out papers. Now the old collodio-chloride process of thirty years ago is being vigorously resuscitated, here and in most other countries, and it remains to be seen if it will eventually, in time, oust gelatine as gelatine did albumen, as some are sanguine enough to predict it will. That both gelatine and collodion papers have their failings as well as their advantages, there is no gainsaying, and what process of photography, it may be asked, has not? It would, however, be rash to speculate on the subject as to the future, beyond saying that it will be a case of the survival of the fittest.

The Uses of Acetylene.—The new illuminant continues to attract popular and scientific attention. We note an account of a method of removing phosphine from the gas obtained from the new source, calcium carbide. The gas, as is known, can be liquefied, and when allowed to evaporate in air it solidifies. The solid melts at 81°, and the liquid boils at 83°. From what may be termed technical quarters, we are led to expect its practical application to illumination purposes, and that indeed a revolution in domestic illumination is at hand. We read that "the advantages of this form of illumination are evident, for the gas in a liquefied form can be used in places where no gas supply exists. Street mains are thus unnecessary, and a light of extraordinary power is placed at the disposal of any one, the price of acetylene being less than ordinary gas." We should understand the latter rather startling assertion to mean that the price is less candle power for candle power. At the same time it should be remembered, and is not usually remembered, that the high price we pay for coal gas is mainly composed of what we may term cost of delivery. If it were feasible to do it, it would pay gas companies to deliver gas at their works at pence rather than shillings per thousand.

Light Action on Eruptive Diseases.—Most of our readers are familiar with the old photographic story of the sitter who could not be satisfactorily photographed because of a series of dark markings which made their appearance on each positive almost as soon as the developer was applied, the sequel of the story being the fact the sitter was unknowingly affected with the first stages of an eruptive fever, the spots of which were perceived in their inchoate stage by the camera before they could be observed by the eye. We have never met the photographer who acted on this occasion, nor is his name handed down to fame; but a still more remarkable connexion betwixt the sun's rays and disease is to be found narrated in a recent number of the *British Medical Journal*. Several investigators have shown that an inflammatory action is produced on the skin by radiations of short wave-length, and hence, when an inflammation already has started, it is reasonable to suppose that it would be increased by such light-waves. Dr. N. R. Finsen, of Copenhagen, describes, in the journal mentioned, his results with small-pox patients confined in a room lighted entirely after the manner of a photographic dark room. The window glass is to be

deep red, or, if curtains are to be employed, several thicknesses must be hung. The treatment must be begun at an early stage, and continued till the vesicles are dried up, and the results are satisfactory.

The Decomposition of Hypo by Acids.—It is known, in practice, by photographers who lay claim to no special chemical acquirements, that upon adding an acid to hypo a milkiness of the solution is gradually superinduced. Thiosulphuric acid is liberated and spontaneously decomposes, and sulphur is deposited. How this action takes place is a disputed point amongst chemists. A contribution towards its elucidation, which must be valuable to students of the theory of the fixing bath, has been made by M. Arnold F. Holleman, and published in *Comptes Rendus*. What is termed the molecular theory, *i.e.*, the production of water, sulphurous acid, and sulphur, is objected to, on the ground that the action should be greatest at the outset when the concentration is at a maximum, but this does not appear to be the case.

Then Spring suggests that the interval that elapsed after the addition of acid, before precipitation takes place, is caused by reaction between the sulphurous anhydride and sulphuretted hydrogen, produced by secondary action; but M. Holleman points out that the precipitation will take place in the presence of a lead salt without darkening taking place, which quite negatives the idea of the presence of sulphuretted hydrogen. He suggests the true explanation of the apparent tardiness in the production of the sulphur precipitate is that the separation of the sulphur takes place at once, but needs time before the particles agglomerate sufficiently to become visible. We would like to point out, in this connexion, a hitherto unexplained phenomenon in photographic practice.

It is well known that the addition of alum to hypo solution leads to the usual sulphur precipitate; but, if a gelatine plate, saturated with hypo, be rinsed very slightly and placed in alum solution, as is done when frilling is anticipated, no milkiness is produced within the film. M. Holleman's theory would explain this phenomenon. The sulphur may be precipitated, but not in a visible form, and there will be little freedom of motion in the molecules of sulphur; they may exist in the film, but fail in consequence to become agglomerated. Something of a similar nature may take place during the fixing of albumen and other prints; the ultimate reaction of such minute particles of sulphur and the coloured salts of the film can be matter of speculation only.

DIGRESSIONS.

I.—Imitation.

The title of this paper covers two kinds of imitation—the imitation of nature by the artist, and the imitation of the work of the artist by the copyist or plagiarist.

There is still a great deal written of the "Stick to nature, my boy" order. This is a survival from the time when it was much more difficult to represent the facts of nature than it is now. Before the discovery of photography there was not much danger of getting too close to nature in any art; but photography soon showed that it was possible to make a picture which more nearly represented the facts of nature than anything that had ever been dreamed of, and yet having in it no art at all. The minute imitation seen for the first time in the early photographs afforded us agreeable surprise, creating pleasure in the mind; but it was a similar pleasure to that we derive from seeing a clever juggler, rather than that we obtain from viewing a work of art, to which may be added the delight and curiosity of seeing a new thing, and admiration for the scientific knowledge that could produce such a wonder. Times have changed. Curiosity in ordinary photographs is no longer excited, and the necessity for scientific knowledge is reduced to a nothing, or, at any rate, is much attenuated.

From a highly and skilfully finished painting—one that is really a minute copy of the facts of nature—although it may not have any pretence to poetry or sentiment we get another kind of satisfaction. We admire the dexterity of the artist's hand and the power he shows of seeing vividly both form and colour. But we must know that it is a deception before we can enjoy it; it must be a gentle surprise, and not a delusion. The deception must not amount to what is vulgarly but expressively called a "sell." Deception offends us, or suits only the lower or uneducated nature. A waxwork figure does not excite such pleasurable or elevated emotions as a marble statue; yet we know that, in the hands of a clever modeller, a wax figure can be made so nearly to represent nature as to be absolutely deceptive. I have run against one myself and begged its pardon.

Now, although the marble may imitate Nature, there is no attempt at deception. As Mr. Ruskin puts it, "A marble figure does not look like what it is not; it looks like marble and like the form of a man, but then it *is* marble and it is the form of a man. It does not look like a man, which it is not, but like the form of a man, which it is."

It may be said that the pre-Raphaelites of between 1848 and 1860 created wonders of art with more minute imitation than had ever been known in paint. So they did. But one of the sources of delight was in the skill and patience shown in such minute finish, and the success lay in the fortunate chance that the experiment was undertaken by enthusiastic young men of genius, and the novelty, intensity, and power of their pathetic subjects. In short, the thing said was eminently worth saying, and the saying was said as it had not been said since the time of the early German and Flemish masters between 400 and 500 years ago. Astonishment was one of the causes of admiration, but surprise was accompanied by other qualities, such as splendid colour and expression. The combination of the power of expression, colour, and minute fidelity to nature in these pictures was so extraordinary that no suppression or subordination was required to lead the eye to the principal parts. There are superfine art critics now who will go into raptures over a few scratched lines on a copper plate who would not allow that the art of which I have been writing was art at all. But, in my humble opinion, there has not been such great art produced this century as Millais' *Ophelia* and *Huguenot*, and Hunt's *Claudio and Isabella*. I still have the pleasure of occasionally sitting in the room in which the *Ophelia* hangs, and am never weary of its wondrous beauty.

It may be claimed that the early photography suggested this excessive study of nature. It probably did; but it was only a suggestion. The best men worked entirely from nature; their imitators took to copying photographs, and then came degeneration, for copying is a different thing from imitation aided by genius, pre-Raphaelite paintings' only merit became very like nature, and "very like nature" has never been enough in itself to make an endurable picture, whether in paint or any other medium.

It is true that nature must be imitated, but it is of little use if the man who turns the handle of the box of music has not the singing voice.

One reason why imitation is contemptible, as Ruskin calls it, is that it is easy. He says: "To the ignorant, imitation, indeed, seems difficult, and its success praiseworthy; but even they can by no possibility see more in the artist than they do in a juggler, who arrives at a strange end by means with which they are unacquainted, and juggling implies more ingenuity in the artist than a power of deceptive imitation." Now, photography gives incomparably the greatest amount of power of minute imitation or copying with most ridiculous ease, and it has lost the power of surprising us with its fidelity, for the detail of a photograph is one of the most ordinary objects of civilised life. Neither does the skill with which the minute finish is attained now affect us; we now recognise that the skill necessary to produce the cleanest, minutest, and most sparkling work is as minute as the work itself, and not to be considered in the result. That there is a skill and a use for technics far beyond those usually employed is also beginning to be recognised. It is not a technic that can be logged down in a text-book, but to use this technic necessitates a knowledge of art, the elements of which only can be taught, and it is this "world beyond" that must attract the photographer if he wishes to attain to, or remain on, the higher level. In future the photographer must no longer trust to the last moment for sufficient time to allow him to produce his masterpiece for exhibition. He must now take time to work up a favourite subject, or

realise a beloved idea, and tax his powers to the utmost, spending as much time upon his effort as he feels is necessary to bring it to as near perfection as his energies will allow; and, above all, if the result does not come within measurable distance of his ideal, to destroy it remorselessly. I am sorry to have to add that, the more progress he makes, the further he sees, the more of his work he will destroy, to which fact—without claiming to see further than others—I am a painful witness. I happen to be the possessor of the mortal fragments of a large, and, I thought for a time, important photograph, on which I had worked for months, and only destroyed after it was framed and ready for the last Salon.

Now we come to the imitation of the works of one artist by another.

It is a moot point how far one artist may imitate—I don't mean exactly copy—another, and yet feel that he continued honest, morally and legally, and, supposing he decides to sail near the wind legally, how near he may go, and still be able to look a brother artist in the face without blushing.

This question of imitation is a delicate and difficult problem. In a learner it may be a merit, in a master a crime. But how are we to estimate it when an artist imitates himself, and does it always? We can only say he becomes a manufacturer. Yet, again, we should be sorry if some artists forsook their own delightful style.

Apart from its morality, the value of imitative work depends a good deal on circumstances. If it is the work of a very young man, it may be, educationally, praiseworthy, and may be tentatively called promising, especially if he shows his taste by selecting a good master to imitate, or even a good school; his copying has not become sinful yet, and he has time to become more original. It is the constant imitation by mature artists that should be one of the unforgivable sins. This is especially true in photography, in which art the mechanical execution of an imitation is a negligible quantity. It is the original thought, plan, treatment, style that constitutes the merit.

Imitative work is interesting, to a certain extent, to the producer—he learns something by producing it—but is worth little to the world; it is but as an oleograph to a painting. Do we thank the man who bores us by feebly whistling over a sonata he had just heard played by Paderewski? There is even merit in imitation when properly used. It is better for the student if he is *not* troubled with too much originality during his noviciate; it distracts his thoughts from the work suitable for his studentship; but he should not show his imitations as his own original work. This, I am afraid, is constantly done in photography.

It is not meant that ideas, hints, and suggestions should not be picked up from the works of others. Imitation, if it is imitation, of this kind is allowable. As the poet says,—

> "Who solely on his own resources draws
> Lives like a bear by sucking his own paws."

On the other hand, it is a mistake to go too far; it is well to weigh the question carefully, How much may be stolen? As Peter Pindar said to Gainsborough when he copied Snyder's dogs into one of his own pictures:—

> "I do not blame thy borrowing a hint;
> For, to be plain, there's nothing in't—
> The man who scorns to do it is a log:
> An eye, an ear, a tail, a nose,
> Were modesty, one might suppose;
> But, zounds! thou must not smuggle the whole dog."

There is yet one other kind of imitation that must be mentioned. I mean the imitation of one kind of art in the materials of another. This has always been a bone of contention among artists. Ghiberti was greatly censured for treating his wonderful bronze gates at Florence more in accordance with the principles of painting than with those of sculpture; but this did not prevent Michael Angelo saying they were worthy to be the gates of paradise. Then, we sometimes see sculpture imitated in paint, and the result is only fit for the entrance to a circus or penny gaff. Some years ago the critics found that water-colour drawings began to look as rich as oil paintings, and cried out accordingly. The alteration of a word set everything right: the artists called their "drawings" "paintings." Simple are the ways of genius; the critics were content.

Some photographers have been accused of imitating sepia drawings. I don't think this has been intentional. The art is in a transitional state, and, if in the search for perfection the results of one art have looked for a moment like those of another, it surely may be excused. When I get short of defensive argument, I like to think of a little incident of years ago. When specimens of Adam Salomon's wonderful portraits were first brought to England, a dear friend of mine worshipped them, as, indeed, did all of us. Not the mildest word of adverse criticism was allowed. You had to look and wonder. One day I ventured to humbly suggest of one of them that, perhaps, a straight line from corner to corner, cutting the space into two equal triangular halves, was not quite the best composition the subject allowed. I was answered sharply, "Perhaps he was working in that direction." Therefore it must be plain that the critic must know what the artist meant before he ventures to comment upon what he has done.

H. P. Robinson.

BY THE WAY.

It is not until we sit down to a little bit of quiet retrospect that we can really recognise how greatly things have changed in the course of a few years, and then, as we realise the vast difference between then and now, a feeling of wonder rises that we are not ourselves more changed. Thus, taking up the volume of the Almanac published just twenty years ago, I find the list of photographic societies in the United Kingdom comprises eight, all told, including the two London ones, with a total of seventy-nine meetings between them in the year. Going a little further into the matter, I find that a single individual, endowed with ordinary health and energy, and who, like myself, desired to keep thoroughly *au fait* with what was going on, could, with the exception of one meeting a month, have attended the whole of them, and still have had a clear half of the month unoccupied. Now, looking into the present year's volume, the list of societies in the metropolitan district alone exceeds fifty, and, in the three kingdoms, has swelled to the enormous total of nearly 300, while the number of meetings in the course of the year is altogether beyond my powers of calculation.

The modern enthusiast, who in London and some of our larger cities can find some photographic entertainment for almost every evening of the week, must find it difficult to realise how he would have felt when the "usual monthly meetings" of his Society—or, in the case of favoured Londoners, of the two Societies—were all he had to look to, beyond his own resources and the two existing journals, for his photographic sustenance; the chances of communion with a kindred spirit were, except in localities where two or three amateurs happened to reside within a day's journey of one another, few and far between, and the pursuit of photography as a hobby was a somewhat solitary one. Yet there were in those days followers of the art every whit as energetic as at the present time, if, indeed, taking circumstances into consideration, not more so, and, as a result, I could point to many instances of lasting friendships formed through the chance meeting of two perfect strangers, whose cameras proved the only means of introduction. Now, thanks to societies and conventions, one can scarcely set foot in a town of any dimensions within the limits of the three kingdoms without being able to hunt up at least one photographic friend to act as his guide, and, I am afraid it must be said, without also meeting with any number of volunteers in the same direction who are utterly unknown. In the old days it was usual to talk of the "freemasonry" of the camera, and to meet one in the course of our wanderings was equivalent to meeting a friend; but we get so much of that sort of thing at home now that we are apt to try and keep ourselves to ourselves as much as possible when abroad.

Yet it is curious that, under the old system of things, there was not anything like the same amount of freedom of intercourse between the members of the then existing societies that there is now. Of course, in every society there would be certain knots or coteries of friends who were probably such before they became connected with the society; but, as a rule, the meetings were formal affairs in which very little enthusiasm was evinced, and where a certain number of comparative strangers met once a month and tried

to be polite to each other without perhaps even knowing one another's names. So much was this the case, that even in London men whose names were "household words" in the photographic world were in the habit of meeting, and had done so for years, once or perhaps twice a month, without knowing any more of one another than they would have done had they lived in opposite corners of the kingdom.

But all this was quickly, if not suddenly, changed on the introduction of the "social" style of meeting. The first symptom of this change was perhaps shown in the "technical" meetings of the old South London Society, to attend which once a year photographers travelled from all parts of the country. True there was also the attraction of the Exhibition in Pall Mall, which was also open when the South London threw open its doors to visitors; but I know many provincials who would not have troubled to come for the Exhibition alone, and who don't come now, with the additional attraction of the Salon thrown in. Then, again, look back at the old "lantern nights" of the same society; what crowded houses they produced! And these gatherings, be it said, were not made up merely of the members, and their friends, and "their sisters, and their cousins, and their aunts," as was originally intended, although, of course, there was a good sprinkling of these. In addition, you would find there pretty nearly every recognised photographer in the neighbourhood of London, amateur as well as professional, "South London" as well as "Parent" Society, and I have even known the exclusive Amateur Field Club hurry over its day's outing and dinner in order not to miss the "lantern show."

I don't think it can be maintained with fairness, as has been attempted, that it was owing to the introduction of gelatine that the great alteration in society matters took place. It is true the two events were in some degree coincident, but I do not think gelatine was the cause, for the change would have occurred without it. It was a feeling on the part of photographers generally that a system of less formal intercourse was desirable, else why the invariable exodus from John Street or Pall Mall the moment the formal business was ended, and the subsequent gathering at Gatti's? It was said in fact, and I dare say with truth, that some members only turned up at Gatti's because they picked up quite as much of the evening's business there as they would have done at the more formal gathering, besides a lot more that was not on the agenda paper. Why, too, do the numerous meetings in London alone continue at least as well attended and keep as late hours now that gelatine, as a subject of discussion outside the plate factories, is as dead as the proverbial "doornail?"

At any rate the Brittlebank experiment soon showed that the promoters of the movement were on the right tack, and I shall not soon forget the scene at Gatti's on the occasion of the first public meeting called there to see how the public would respond. It had been expected that a private room would be available, but at the last moment this failed, being required for a public dinner, and when the "crowd" began to arrive in anawer to the announcement in the journals, and all made for the usual corner, great was the excitement amongst the waiters and ordinary customers. The former were loud in their cries of "Plenty of seats this way, gentlemen," but the gentlemen preferred to stop where they were even if they had to stand, and "Tony"—Giuseppe was his real name, but he had been christened "Tony" for "shortness"—must have made a small fortune that evening. Eventually there was an adjournment to an adjacent street to the chambers of one of the members of both the existing societies, and I venture to think he never entertained so large a party before or since. Then the Photographic Club was formed, and the London and Provincial, and now it would be difficult to find a quarter of London that has not two or three meetings a week devoted to photography, with the "social element" not forgotten.

Although I have digressed thus far, and laid so much stress on the popularity of the more social style of gathering. I should myself be the last to attempt to put down the more formal meetings which serve to keep up the dignity of photography. It would be in the last degree pitiable to find ourselves without any meetings at all that still adhered to the ordinary formalities of scientific societies. But there is in the interests of ordinary photographers, who only meet for the purpose of comparing notes, no necessity to overdo the formality. In the case of the parent society—the Royal—which I think may be said to occupy a unique position and to represent the scientific phase of photography, it would be wrong to depart in any way from the rules as they at present exist; indeed, I am strongly of the opinion, although others I am aware are not, that it is only by keeping strictly to certain formal rules, and maintaining a certain dignity that has been dubbed "stuck-uppishness," that the parent society is now able to call itself the "Royal."

I notice that a motion is on foot to bring about an alteration in the rules, that will have the effect of annually introducing new blood into the Council and management; but surely the present provisions in that direction are sufficient. If it is intended, by the new movement, to dislodge, if not at once, gradually, those members of Council who, by the very length of their years of service, lend dignity to the Council, I for one think it a mistake. Going back as far as the early "seventies," there might have been some reason in such a movement; in fact, a precisely similar attempt led to a complete revolution in the Society, and the breaking up of what, at that time, was little better than the "clique" it was declared to be. But things have very materially altered since then, and, so far as I can judge, from outside, do not require any special attention at the present juncture.

There is one point, however, on which I would join in with the present agitators, namely, in only having on the Council such as are actually practical photographers, whether they be scientific, professional, or amateur. I have not by me, at the moment, a list of the present Council, and, if I had, it would be invidious to single out any instances for reference, if such there now be. But in days gone by, and that not far, the Council of the Photographic Society has been made up of names, eminent enough in their right place, but altogether out of that place in connexion with photography. The Royal Academicians would not elect the Archbishop of Canterbury R.A. because he whiled away his spare moments in sketching, nor would the Chemical Society elect as president an eminent mathematician who dabbled in elementary chemistry. Why, then, should the Photographic Society do differently? I had the accidental honour of sitting next to a very great man in the scientific world, at a lecture before the Society of Arts on a photographic subject. The individual in question had been, or then was, a member of the Council of the parent Society, but I found from his conversation that he was quite ignorant of photography, and although he used it in his researches, it was entirely by deputy.

Soon after the reform movement had been successful in 1873 or 1874, in which, by the way, not many living men are aware how important a part our lamented friend, Traill Taylor, took, it was suggested by one of the members that the Society should go in for a charter of incorporation. The proposal was met at the time with a shower of ridicule, and possibly the objections at that time were valid ones. But now, after twenty years, the change has been successfully effected, and, with altered conditions in every way, the Society seems in a fair way to reach and maintain a position it could not hope to aspire to at that period.

DOGBERRY.

"HOME-SENSITISED" ALBUMENISED PAPER, AND HOW TO USE IT.

BEFORE repeating some details of my practice I desire to make a protest on a personal matter. I think every one who has any personal knowledge of me will bear witness to my readiness to impart information, or give instruction to any one—amateur or professional—at all reasonable times; but, when I have treated any topic in an article over my signature in these pages, I consider that the proper method to adopt, by any one wishing for further information from me, is to apply for it through the Editor. If this unwritten law of courtesy were only occasionally infringed, I should not complain; but I have been so often appealed to by unknown correspondents from all quarters of the globe (not long ago a request for additional information came from Australia), that I wish here to place on record

my desire (which I think the Editor will endorse), that if any further information of my practice on any subject I write upon in these pages should be wished, I will willingly give it, but only through the medium of THE BRITISH JOURNAL OF PHOTOGRAPHY, and not through post. Three letters within the past month have been received by me from perfect strangers, asking for my advice. I sympathised with the writer of one, and replied by sending him three closely written pages; but, to prevent him treapassing further, I said, if he wished more instruction, I should require a fee. That effectually stopped him; he never even acknowledged the receipt of the letter of instruction I did send! but, as that is a common experience with me in these affairs, I do not think much of such an exhibition of lack of courtesy. The old results of practice I am about to pen are in reply to a letter I received quite lately. I replied to it that I had been compelled to make a rule not to give instruction through post to perfect strangers, but that the Editor might possibly insert an article from me on the subject indicated by the title of this paper, which was the matter inquired about.

The continually growing use of both gelatine and collodion sensitised papers bids fair to soon make all albumenised paper practice matters of ancient history; but, as there are evidently many who, like myself, have not abandoned its use, my remarks will not be without point to a number of readers. I am not acquainted with many photographers of this country who follow the practice common in America of fuming their paper before printing; but, for those who do, an immense gain in keeping property will be found if the paper after sensitising is floated on two successive baths of distilled water, so as to remove all the free silver. The paper will keep white for weeks, and need only be fumed immediately before use. It should be far more strongly fumed than would be right for the ordinary unwashed paper; indeed, it cannot be too strongly fumed, and it should be put into the frames at once. It will be found to tone readily, and to a good colour. Many years ago I worked this process to a considerable extent, and with very satisfactory results, but I found in practice that, as soon as the ammonia was dissipated, or nearly so, the paper printed slowly and unsatisfactorily. Besides fuming the paper, I also fumed the felt pads of the frame, and, after placing them over the paper in the frames, covered them with waxed paper. Prints so produced had a richness and vigour superior, I think, to those by any other method. I used to place the strong ammonia in a saucer, covered with wire gauze, at the bottom of a large stoneware jar, and then kept all the pads not required at the time in the jar ready for instant use. Eventually, however, I found that to get perfect results so much personal supervision was required; and, further, the ammonia at times made itself so uncomfortably prominent that eventually I entirely gave up the plan.

But, concurrently with the abandonment of the ammonia method, I adopted another mode of preserving to some extent the whiteness of the paper, which, down to the present day, I have consistently employed. I refer to the carbonate of soda pads, and this I expect it is that my correspondent makes inquiries about. It is very simple; there is no secret in it. Others besides myself have described it in these pages, but it is good enough to deserve repetition. The sensitised paper, as soon as dry, is placed between sheets of the prepared paper—alternate sheets of the sensitised paper and the carbonated paper. Thus stored, especially if under pressure, the paper will be whiter at the end of a week than after one day's keeping under ordinary conditions.

Then, again—and this is the most important item of practice—all the printing frames should be supplied with soda pads, to be placed immediately over the back of the sensitised paper during printing. A print needing three days' exposure during a spell of dull weather will be free from yellowness, and will tone quite easily when placed in the toning bath, a condition of things entirely out of question under ordinary conditions. I have heard it stated that these soda pads are apt to injure the negatives if left in contact with them, causing little pits to form in the varnish. I have not experienced this effect in my own practice, but it can easily be provided against by keeping in the printing frame, together with the pads, a second plain glazed-paper pad; then, when the frame was empty of prints and waiting for refilling, the pads could be so placed that the plain piece was in contact with the negative.

I have not yet described how the soda pads are made, and I will conclude my remarks by the necessary description. They are simply sheets of porous paper containing carbonate of soda within their texture. To make them, a strong solution of common washing soda is made, strength not material, say, twenty per cent. Thick blotting-paper is soaked with this, and allowed to dry. It is then ready for use. In practice it will be found very difficult to handle the wet paper, but, if it is stacked in alternate sheets of wet and dry paper, enough solution will be present to soak every piece, and it will not be so "rotten" to handle.

The method here described is in constant use in my printing room, and has many advantages, and, as far as I know, no disadvantages.

G. WATMOUGH WEBSTER, F.C.S., F.R.P.S.

SOLUBILITY OF SILVER IN HYPOSULPHITE OF SODA.

THE following question has been frequently asked by different people at different times, "Does a gelatino-bromide plate after development lose density during fixation?" and, up to the present, no completely satisfactory reply has been given.

According to Mr. Charters White, M.R.C.S., he failed to detect any difference between two portions of a dense film, one part soaked in a saturated solution of "hypo" for six weeks, and the other soaked in plain water. In each case the film was mounted in a microscopical cell and examined under a microscope.

In a second experiment, made by the same gentleman, 162 grains of metallic silver were soaked in a saturated solution of hypo for one month. At the end of this time, after being washed and dried, it was found to have lost two grains. From these observations Mr. T. C. White concludes that metallic silver is insoluble in hyposulphite of soda, and that the density of a negative cannot be altered, however long it may be left in the fixing bath. (THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1893, page 552.)

In THE BRITISH JOURNAL OF PHOTOGRAPHY for 1892, a correspondent (Mr. Albert Levy) contends that the developed silver image suffers reduction more or less during fixation, and practically attributes to hypo the property of dissolving metallic silver.

In a paper written by A. H. Sexton, F.C.S., F.I.C., in *Photographic Scraps*, November, 1894, we find the following statements:—"Some pure silver in a fine state of division was prepared, weighed, and portions were placed in solutions of sodium hyposulphite of varying strength, and left at the ordinary atmospheric temperature for some days. In every case a considerable quantity of silver was found in solution, so that finely divided silver is not insoluble in sodium hyposulphite. "Strips of gelatino-bromide prints, developed with hydroquinone, were put in large test tubes, covered with the solutions (hyposulphite of soda, 10 per cent., 20 per cent., and 10 per cent., with metabisulphite added to give acid reaction), and were left at the ordinary temperature, exposed to light and air. The action was slow, the image showed signs of fading in about four hours, and in about thirty hours it had almost completely disappeared. Having used amidol largely for bromide work, a large number of experiments were made with bromide prints developed with this. In one hour the image was very decidedly paler, in two hours it had become very pale, and in about four hours the image had disappeared. The reduction brought about by the action of hypo cannot be used for the reduction of over-printed prints, because the fine detail just disappears and the image soon acquires an unpleasant brownish colour, and even after very long action a very faint brownish image remains on the paper."

With such contradictory statements before us on such a subject, which, at first sight, seems so easy to decide once for all, we have, for some time past, been making experiments, in the hope of finding out the reasons for these discrepancies.

At the very outset it occurred to us that direct experiments on films of gelatine containing silver and silver bromide would not be suitable substances to deal with, as the matter might be very much complicated by the presence of the gelatine, and, in order to test the solubility or otherwise of silver in hypo in presence of silver bromide, we made the following experiment:—

Some silver bromide was prepared by precipitating some carefully

purified silver nitrate with potassium bromide; this was thoroughly washed with hot water in order to remove all soluble salts, dried, and preserved in a stoppered bottle in the dark. About five grammes of the silver bromide were exposed in a thin layer to daylight for ten minutes, and then treated with a ten per cent. solution of pyrogallic acid, and an equal quantity of a ten per cent. solution of caustic soda; the action was allowed to continue for fifteen minutes, when the liquid was poured off, and a second quantity, equal to the first in volume and of the same composition, was allowed to act for the same length of time, and then poured away. The mixture of reduced silver and unreduced bromide of silver, being washed with boiling water until all soluble matter had been extracted, was then ground in an agate mortar till it was reduced to an impalpable powder of uniform composition. A portion of this was placed between two watch glasses, and dried in a water oven until the weight became constant, showing that the powder had become quite dry. The weight of dry powder was found to be 1·7690 grammes. After being placed in a beaker, it was boiled with pure dilute nitric acid (free from chlorine), this was repeated four times, in order to be absolutely certain that all the metallic silver had been dissolved. After washing and drying, the residue, which consisted of bromide of silver, was found to weigh 1·5540 grammes. Subtracting this weight from the weight of mixture operated on, 0·2150 gramme is obtained, showing that the percentage composition of the original powder was:—

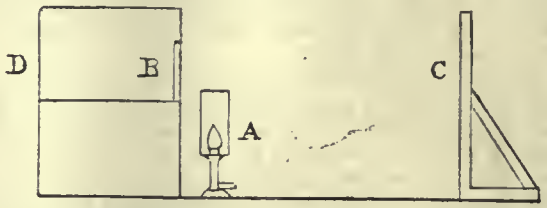
Metallic silver	12·15	per cent.
Silver bromide	87·85	„
	100·00	„

Another portion of the original mixture was dried in the same manner as before, and found to weigh 1·3700 grammes; it was then treated with 100 cc. of a twenty per cent. solution of hypo for ten minutes. This was poured off and replaced by another 100 cc. of the hypo, and allowed to act for a similar period, poured away, and the residue, consisting of metallic silver, washed, dried, and weighed. This was found to amount to 0·1646 gramme, and, calculating from this, the percentage composition, we obtain:—

Metallic silver	12·01	per cent.
Silver bromide	87·99	„
	100 00	„

The figures representing the amounts of silver present in the original mixture are almost identical, and well within the limits of experimental errors of a single analysis, and show that under ordinary conditions of the fixation of plates, *i.e.*, fifteen minutes' immersion in a twenty per cent. solution of hypo, no metallic silver is dissolved, and there can be therefore no alteration in the density of the silver image from this cause, unless the presence of the gelatine should alter the character of the silver deposit. In order to test this point, the next experiment we made was on an ordinary gelatino-bromide plate. The plate, after removal from the box in the dark room, was exposed for a couple of seconds to an ordinary gas flame, at a distance of about three feet. It was then developed in metol, carbonate of soda and sulphite. This developer was selected so as to avoid yellow stain in the finished plate. The development was not carried very far, as rather a thin image was required for examination. It was then washed and fixed in the ordinary way. The fixation was a little longer than usual (twenty minutes), so as to make sure that all silver salts that could be dissolved by the hypo were removed; the plate was then thoroughly washed and dried. On examination by transmitted light, the opacity of the plate at the centre, at least, seemed pretty uniform. The plate was then cut in two down the centre, and examined photometrically. The photometer first tried was of the Bunsen type, but we very soon found that it was difficult to recover the same readings, in consequence of the small amount of light transmitted. We then extemporised a photometer on the plan originally used by Mons. Bouquer, for the study of the absorption of light by different transparent media.

The apparatus is very simple in construction, and, as it might prove useful to others desirous of studying the absorption of light under different circumstances, we will endeavour to describe it. A box, D, about two feet long and one foot broad was taken, the depth is of no importance. In the bottom of the box two holes were bored, about three inches apart. This was raised by means of blocks till it was of such a height that a Welsbach lamp, A, could be conveniently placed between the two holes, but out of sight of the observer when looking through the holes, the lid side of the box being towards the observer. A large sheet of white paper, C, was divided into two, and each piece supported on a frame, one half opposite each hole, at a distance of two feet from the bottom of the box. On looking through the holes, one eye for each hole, it was easy to see whether the two pieces of paper received equal amounts of light from the burner; if not, the white screen which appeared the darker was made to approach the burner. With a little practice it was easy to hit off the exact positions when they appeared equally bright, and we could



Section of Bouquer's Photometer.—A, Welsbach lamp. B, plates being tested. C, reflectors (sheets of paper). D, position of observer's eyes.

thus ascertain what kind of error was likely to occur in any measurement. The paper being in both cases of the same kind, and there being but one source of light to deal with, for equal illumination the two pieces of paper ought naturally to be the same distance from the lamp. This photometer is far more simple than the Bunsen, as with the latter two sources of the same intensity are required, and this is not a very easy matter to realise, especially when it is necessary that they should continue to give out equal amounts of light over a long period. With Bouquer's photometer one source of light only being required, if it vary for the one screen, it varies for the other in the same proportion.

The photometer being set up, one portion of the plate was placed in front of one of the openings and the other in front of the other, B, and one of the screens moved backwards and forwards till they, or those portions that were visible, appeared equally bright. This was repeated several times and proved that the superficial examination of the plate was correct, *i.e.*, that the opacity was uniform. One of the pieces was then soaked for twenty minutes in a twenty-five per cent. solution of hypo. At the end of that time it was placed in water, to remove the hypo; and, in order to prevent any unequal change due to this second soaking, the other half was soaked in the same vessel. After washing for half an hour, the plates were allowed to dry spontaneously, and again examined. No change in opacity could be noticed, so that during twenty minutes' soaking in a twenty-five per cent. solution of hypo no change in density can be detected photometrically.

The same piece of the plate that had been soaked in hypo for twenty minutes was returned to the solution, together with a piece of gelatino-bromide paper which had been exposed so as to obtain a graduated strip, developed and fixed, and the two left in the solution for twenty-one hours. During this interval the paper, for some reason, shifted in position and covered a portion of the plate. When examined at the end of this time, it was found that the portion of the plate which was uncovered by the paper had changed from black to brownish yellow, while the covered portion was still black, but much less dense. The paper had lost its original blackness and was also changed to yellow, the different gradations being still distinctly visible. The portion of the plate left in the hypo for twenty-one hours was again compared by means of the photometer and, though the colours were very different, yet it was easy to determine their relative light-stopping properties. The fixed portion was to the original in the ratio of 1:11. The same pieces were then used to print a piece of gelatino-bromide paper, in order that we might estimate their relative powers of stopping the actinic or active portion of gaslight. In order to compare the two, the strip of paper was again exposed, so as to produce a scale of gradation, as was

done previously, exposing for sixteen, eight, four, two, and one seconds to a gas flame two feet off. On development, it was found that the tint which was produced by one second of the plate long soaked in hypo corresponded to the tint produced in six seconds on the original portion of the plate, thus showing that its value as a printer was reduced from six to one.

A. HADDON,
F. B. GRUNDY.

(To be continued.)

WHAT IS IMPRESSIONISM?

IN the course of a review of Mr. R. A. M. Stevenson's *Art of Velasquez*, a writer in the *Spectator* gives the following definition of impressionism:—

"Once the impressionist theory of vision and painting is grasped, it is easy out of various writers, even out of Ruskin himself, to collect passages skirting it or glancing at it. It is the doctrine that Reynolds attempted to state. It is what painter after painter has more or less consciously applied without being in words able to express it clearly. Mr. Stevenson is the first to make a good book about it.

"The name has been much against the thing with those to whom it was only a word. 'Impressionism' is a luckless enough term for a revolution in pictorial vision as radical as the introduction of chiaroscuro, of linear, or of aerial perspective. Inevitably it has been taken to mean hurried sketching. Now, a pre-Raphaelite may sketch hurriedly, but his sketch is not impressionistic, it is merely a hasty statement of his ordinary habit of vision. That habit is one of simple addition. If he has plenty of time, he puts down 1, 2, 3, 4, 5, 6, 7. If he has less than half the time, he puts down 1, 2, and a bit of 3. This impressionist goes to work by summing these particulars before he puts down the result. He is therefore capable of a more rapid statement, but time is not of the essence of his procedure. His process of thought may take a longer time than the other's thoughtless enumeration. Nor, again, is a pre-Raphaelite picture made into an impressionist by blurring it over, as some have fondly imagined. (Painters will tell you that they do 'impressionist' work *sometimes*.)

"Impressionism, then, does not mean hasty impression nor misty impression. It means *unity and order of impression gained by focussing the subject*. Just as linear perspective introduced a unifying natural action of the eye into painting, with one angle of view in place of a dozen, so does impressionism follow the natural eye, with one focus for a dozen.

"Focus affects the clearness of definition in two ways. If a number of objects, A, B, C, D, E, stand at different distances from the eye, and the eye rests upon and adjusts itself to C, the nearer objects, A and B, and the farther objects, D and E, are thrown out of focus and are blurred. This may be called the *focus of distance*, and to represent two objects at different depths in a picture with the same clearness of definition is to puzzle and contradict the eye.

"But there is also the *focus of attention*. According as the eye selects one feature of a scene, or allows itself to wander more freely, the definition of the parts will alter; and, if we wish in a picture that it should be known what we were looking at, a not unreasonable desire, we must follow this procedure of the eye. If I look at A and B together, my attention is more diluted than when I look at one of them, and the definition of each is weaker—it is the pattern including the two that is defined. If I look at A directly, with B still there, but not attended to, the definition of B is fainter. The pre-Raphaelites call attending to everything equally being 'faithful.' It is a stupid and self-defeating faithfulness that is false to all that gives vision significance.

"So much for form. A similar law holds with regard to colour. The impressionist will not skin off all distance till his eye reaches a flayed local colour. He will fix with himself a distance that relates all local colours in a key. Nor will he scrutinise each patch of colour in turn with equal attention. If a yellow spot is focussed in a scene, all the other colours alter; if the eye leaves the yellow to play more freely, the yellow loses its insistence, and the *colour of the scene* asserts itself.

"It is only the unthinking who will accuse impressionism, thus understood, of being an easy slap-dash kind of painting. To appreciate the exactly right force of definition for the parts in relation to the whole is a task that employs the rarest faculties of vision, since to a sensitive eye a single false accent will destroy a whole picture. It is the pre-Raphaelite elaboration of all parts with equal force that is the easy plan. The very brute camera is not so stupid. And, if it be argued that all this is a matter of mechanical and realistic rendering of facts, the assertion is manifestly untrue. Attention is governed by feeling, every change in the definition of an object means a change in our emotion about it. Impressionism, in a word, employs the means of emphasis natural to vision. Other methods of emphasis there are, that of the decorative line, the silhouetted shape, the colour patch, and a painter may bind himself by the simpler conventions if he pleases; but, if he does not comprehend impressionistic vision, he is not full-grown in the theory of his art, and is blind to its later history and triumphs."

A NEW LENS—THE PLATYSTIGMAT.

THE Platystigmat is the name of a new lens just introduced by Mr. W. Wray, of North Hill, Highgate, and which, on the occasion of a recent visit to his establishment, we had the opportunity of trying.

The distinctive name chosen for the lens is, we believe, intended to signalise its possession of a flat field associated with the absence of astigmatism. The lens may be described as a symmetrical doublet, each combination consisting of a cemented triple, in the construction of which the now well-known properties of certain of the Jena glasses have been availed of, but we are without precise details as to the curves of the component elements.

The Platystigmat of five inches focus gives a flat field over a very wide angle, ninety degrees approximately, and, although at full aperture, only intended to cover quarter-plate, it perfectly will covers a size larger plate without being stopped down. At *f*-16 it covers a half-plate and at *f*-32 a whole-plate, thus proving its powers as a narrow or wide-angle lens at will.

In the way of flatness of field, as we have pointed out, the lens is all that can be desired, and, employed with the apertures and for the sizes enumerated above, it is remarkably free from astigmatism; hence it possesses, and that in a marked degree, the very qualities which modern opticians have set themselves the task of imparting to their productions. We need therefore hardly remark, from the data given, that the Platystigmat is capable of being subjected to a variety of uses which constitute it a most serviceable all-round lens.

HEAT AND TONE.

By E. W. BLUNT.

[Written for the ALMANAC, but received too late.]

SOME little time back I had occasion to take a gelatino-chloride print off its mount, and for the purpose I resorted to steaming it. Although the result was not entirely successful in the direction originally aimed at, an unexpected effect was produced that was rather interesting—the tone of the print, which, before treatment, was a purple black, of a decidedly "cool" shade, was, under the influence of the heat, changed to a brown tint, verging between chocolate and sepia, and of a distinctly pleasing character. The paper was Ilford matt-surface, with which, although I am rather partial to warm tones, I am unable to get them with any degree of certainty in the ordinary mode of working; but, if this plan should be reliable, as upon one or two subsequent trials it seems to be, it is easy enough in practice. I may say that the process of steaming does not seem to have any injurious effect in loosening or dissolving the picture, on the matt paper at any rate, though possibly with the glossy surface it might be different.

The question may be raised is, Are the tones so produced permanent? So far as I can see, they are for the time being, that is to say, wetting and redrying the print produces no alteration.

But is the action of heat likely to set in motion any action that is calculated to go on and lead to the ultimate fading or destruction of the image? I am told that albumen prints, after fixing and washing, have their tones rendered considerably warmer by immersion in very hot water, and that the colour so produced is apparently permanent. This action seems analogous. Is it reliable?

GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

ANNUAL EXHIBITION.

(From our own Correspondent.)

IN Glasgow and the West of Scotland the approach of Christmas is always looked forward to by a very large number of amateur and professional workers with interest, on account of the annual display of work in the Association's rooms, 180, West Regent-street, and this year has been no exception, for the extensive wall space is occupied by as fine a collection of amateur photographs as was perhaps ever displayed by one association.

In judging the exhibits the Council have this year made a fresh departure. In former years the awards were made either by ballot of the members or by professional Judges. This year Messrs. Alexander Robb, Ralph Elder, and Thomas Taylor, who were assisted by two local professionals, undertook the onerous duty of judging the pictures, and but slight exception—if, indeed, any—can be found with their decision.

A visit to the elaborately furnished rooms of this Association is at all times a pleasant undertaking to any one interested in photography, were it merely to inspect the operating, enlarging, dark rooms, and library of the Association, each of which is fitted up in a most lavish manner, and which is perhaps equalled by no other association in the kingdom.

The Exhibition this year, so far as the excellence of the work is concerned, is a very long way in advance of past years; in fact, not a single poor photograph finds a place on the walls.

Mr. Goodwin has succeeded in gaining first honours for both lantern slides and stereoscopic transparencies. In the former there were no less than twenty-three competitors, and the Judges were aided in deciding this class by the services of Mr. Arch. Watson, who along with Mr. Steventon, were present when the slides were judged upon the screen.

Annexed is list of awards:—Landscapes (over half-plate), silver medal, Stewart Smith; bronze medal, John Ferguson. Landscapes (half-plate and under), silver medal, J. C. Oliver; bronze medal, J. M. Ewing. Enlargements of Portraits, Groups, and Figure Studies, silver medal, Professor Finlay, M.D.; bronze medal, J. C. Oliver. Enlargements of other subjects, silver medal, Professor Finlay, M.D.; bronze medal, Archibald Watson. Pictures taken at Outdoor Meetings, silver medal, J. C. Oliver; bronze medal, Archibald Watson. Portraiture, silver medal, John W. Eadie; bronze medal, Stewart Smith. Hand Camera, silver medal, A. Lindsay Miller; bronze medal, J. Imbrie Fraser. Instantaneous, silver medal. John W. Eadie; bronze medal, A. H. Duncan. Lantern Slides, silver medal, Wm. Goodwin; bronze medal, Thos. W. Robertson. Stereoscopic, silver medal, Wm. Goodwin; bronze medal, Wm. Goodwin; extra bronze medal, John W. Miller.

TASTE IN PHOTOGRAPHY.

What is Taste?

On referring to the dictionary, you will find, under the heading "taste," various significations of this much-used word of the English language; but the one for our purpose will be the following: "In æsthetics, the faculty of discerning with emotions of pleasure, beauty, grace, congruity, proportion, symmetry, order, or whatever constitutes excellence, particularly in the fine arts and literature." This agrees well with Alison, the standard authority on matters of taste, who says: "Taste is, in general, considered as that faculty of the human mind by which we perceive and enjoy whatever is beautiful or sublime in the works of nature or art." Some later authorities enlarge upon these definitions, and consider taste to consist not only in the perception and enjoyment of beauty, but also in the recognition of a moral quality. Of this number are Carlyle and Ruskin. This moral quality we may leave aside, and consider taste only in relation to the beautiful.

Although taste is thus defined, it is more easily discoverd in its results than expressed by any mere order of words. Most persons appear to have a natural gift, and show some emotion on beholding a beautiful object either of form or colour, and, as Dr. Blair remarks, "they sometimes strike in the same manner the philosopher and the peasant, the boy and the man." In general, a bad work of art is speedily passed over, and the fullest attention given to that which is better, even by those who have had no art education. Yet these rough connoisseurs may be quite unable to give any clear reasons for their choice, or to say upon what principles they preferred the one work before the other. Of course exceptions can be found, but such do not destroy the rule, but rather show the variety and complexity of tastes. Many such act out of the spirit of contradiction. Every photographer can recall to mind the sitter who invariably chooses a bad proof before one that, in the general opinion, is decidedly superior. The same spirit is often found in experts, and Hazlitt sums up such men as follows: "If there are connoisseurs who spend their lives and waste their breath in extolling sublime passages in obscure writers, and lovers who choose their mistresses for their ugly faces, this is not taste, but affectation."

Dismissing, therefore, these exceptions, it may be stated that all persons are possessed of taste; they have a natural faculty of preferring some things before others merely because they consider them more beautiful. This power naturally varies with each individual. "In some men only the feeble glimmerings of taste appear, the beauties which they relish are of the coarsest kind, and of these they have but a weak and confused impression, while in others taste rises to an acute discernment and a lively enjoyment of the most refined beauties."—Blair. Taste is thus really a feeling, a sentiment, an emotion rather than a judgment upon things. As Ruskin says, "When we analyse it, it means, of course, merely the right direction of feeling."

Like all feeling, taste, when once it obtains expression, is capable of acting upon the feelings of others. Thus, the artist or photographer who can fix the sentiment of taste upon his material will from thence be able to influence and cause similar sentiments in all those who behold his works. Although of such a vague and apparently unsubstantial nature, it is taste which will finally decide what a man's work will be; and it is only through his work that we can judge of the correctness or badness of an artist's taste. Taste, then, is just that quality in a work of art which gives it either success or failure.

Taste in Business.

My readers may be asking what all this tall talking has to do with them as portrait or landscape photographers, and I can only answer, Much more than the average photographer appears to think. I also believe this question of taste has a most important relation to the business of a photographer, even in its most commercial aspects. If we look around and pick out the men who have made the most rapid progress, and raised themselves to high positions in the profession, we shall be compelled to admit that the one distinguishing characteristic of their work is—taste. From a technical point of view, their work may be not the least better, and sometimes worse, than the men who are struggling around them. Yet, in spite of this, such men seem always to be prospering, and have no difficulty in obtaining sitters. Their superior taste saves them, whilst the man doing work of equal quality, and yet lacking in a sense of taste, is lost. It is useless to lower his price, for his rival can still command customers enough to pay well for the superior article.

It is often a mystery to some photographers how it is a rival succeeds where they fail. On comparison, they cannot see that his work is superior to their own. I attribute this to nothing else than the lack in the unsuccessful photographer of this saving grace of taste. Having little himself, he fails to grasp the essential quality of his rival's work. It is just this want of discernment which makes the difference. Taste, then, has a business utility.

In this connexion it must not be forgotten that the general art education of the people has made rapid advances of late years, and that the old-fashioned painters' and photographers' ideas of the curtain and the pedestal as necessary accessories are long out of date. If, therefore, a photographer's taste has failed to keep up and improve with the changed conditions, it is certain that he must be left behind with his curtain and pedestal. To succeed, a photographer must not only keep up with the general taste of the times, but must also advance, and, if possible, lead the taste of his customers. That such an advance in photographic taste has taken place in the past can be readily verified by comparing the average portrait of to-day and those that have survived from past years. Some of the best of to-day, more especially amateur productions, have reached a high state of excellence, and exhibit the most refined taste. Some may deny this excellence of amateur productions, but I maintain that the amateur, in this, as in many other respects, has been the leader of the professional photographer. If there is one thing above another which marks the amateur from the professional, it is the taste of the former. If once the amateur gains a complete mastery of the technique of photography, he generally produces some fine artistic work. This arises from two causes: Firstly, the spirit with which the amateur works—for pure love of the art causes him to give his emotions the fullest play, and they come out more distinctly in the work he produces; secondly, the amateur, as a rule, is a man of education, and more cultured than the photographer. Now, culture is simply the development of natural taste, and thus it comes out in his pictures.

Can Taste be Acquired?

Taste must be largely a natural gift rather than acquired, yet, at the same time, a natural gift is useless without training and exercise. A fine taste can only be formed and strengthened by reflection, study, and comparison. The two principal marks of a fine taste are delicacy and correctness, and these are naturally of a slow growth. "An eye for the beauties of painting is never all at once acquired. It is gradually formed by being conversant among pictures, and studying the works of the best masters."—Blair.

Study of the works of the masters of an art is always a fruitful source of improvement, for by this method we can make a comparison of lower and higher degrees of the same beauty. But it is no gain if, by this study, we are led to imitate these masters, for nothing allows of so much diversity and variety as matters of taste. It is therefore well to strike out a path of our own rather than follow other men. Exercise is likewise most helpful, by constantly trying, experimenting, and endeavouring to express his taste in works, the photographer will greatly increase the facility of acquiring tasty pictures. The alteration of a single fold of a dress, or the line of a chair, or foliage, will often produce a marked improvement. These are the little things which show taste.

It also helps to develop taste to be surrounded with objects that are at once refined and beautiful. To the photographer this means combining the useful with the beautiful. "Even the necessary arts are exalted into dignity by the genius that can unite beauty with use," says Alison. This taste can be exercised and displayed by every photographer in the choice of furniture. An excellent plan, followed by many, is to purchase articles, whenever you see any adapted to your purpose, instead of selecting from a limited choice of entirely unsuitable things.

The sordid details of business must not, however, engross the whole attention, or that delicacy, which is the essence of taste, will be extinguished, as Alison remarks, "The finest natural taste is seldom found able to withstand that narrowness and insensibility of mind, which is perhaps necessarily acquired by the minute and uninteresting details of the mechanical arts."

Correctness, being also a quality of taste, is only to be acquired by comparison. Photographers, at the present time, have a tendency towards the ill-defined, and Ruskin asserts that the ill-defined constitutes bad taste. In opposition to this the black and white artist leans towards the photographic and well-defined. It is interesting to compare the illustrated journals of to-day with those of ten years ago, and to notice how largely the modern artist is dominated by the photographic spirit. Some of these drawings are so photographic that it is difficult to distinguish them from products of the camera. In this case we have a marked advance in taste that is worthy of study. Many other instances might be given showing how taste may be acquired and used, but these suggestions must suffice, they can be expanded by any who care to think over the subject.

It must not be forgotten that the foregoing remarks apply to every photographic worker from operator to printer, and even spotter and mounter; taste can be displayed in all branches of photographic work; it is in fact a necessity. Photography is a profession because it cannot be acquired by rule and measure. It is very difficult to examine for proficiency in photography; you may examine in chemistry, optics, mathematics, but the test of a photographer as of an artist is the taste and ability displayed in his works. Taste, therefore, is the first and last requisite in a photographer.

JOHN A. RANDALL.

DOINGS AT THE CAMERA CLUB.

THE past year has been a somewhat anxious one for the executive of the Camera Club, unforseen difficulties having presented themselves; but the closing months of 1895 have brought with them beneficial changes, and with those changes have come renewed hopes for the future of the institution, and it is believed that under the sway of a new Manager, in the person of Mr. Seyton Scott, the Camera Club will now enter upon a period of greatly increased prosperity. Already this is foreshadowed to some extent by the number of applications for membership which have come to hand during the month—a result largely due to increased vigilance upon the part of the executive, as witnessed by the bill of fare provided for the entertainment and instruction of the members and their friends.

A cynic once observed that the attitude of the public towards those whose business it is to speak to them from a rostrum is expressed by the aphorism, "Entertain me, if you can; instruct me, if you dare." That there is much truth in this remark is instanced by the balderdash which the public will flock to hear, while real merit is unappreciated and passed by. Even in a coterie like the Camera Club the rule holds good, but in a much minor degree, for the bulk of the members are earnest men, who would not readily lose the opportunity of benefiting by the experiences of others who are working in the same direction as themselves; but there are others who are so far human that they very much like being amused, and the smoking concerts are most heartily enjoyed by them; and let it be noted that as a rule—of course, there must be exceptions in such a matter—the music is of the best, and the recitations and other forms of entertainment quite above the average. One smoking concert per month, which is the rule at the Camera Club, is not too much by way of relaxation from more solid mental food, and the patronage which they meet with is a plea for their continuance.

The month of December has been decidedly photographic in tone. The elementary series of lectures has been kept going, first by Dr. C. S. Paterson, who on the 9th ult. discoursed on enlarging photographs by means of artificial light, and by Mr. E. Calland, who a week later gave the members his experiences with carbon printing, while at the same time a retouching class, under the direction of Mr. Redmond Barrett, has been formed for the benefit of those members who have not yet arrived at that stage of "forardness" when "retouching" becomes a crime. We regret that accident prevented us hearing Mr. Pringle's account of his "Journey to the Dolomites and Back," for we are sure that both matter and pictures would be worthy of their author.

Mr. Henry Blackburn's discourse on *The Value of a Line* drew a big audience, for this gentleman is fully acquainted with the art of blending amusement with instruction, and, moreover, he knows his subject well. Those who do not know what Mr. Blackburn has done for illustrated journalism generally, or who forget that he is the creator of the illustrated catalogue at picture galleries, might perhaps be puzzled at the title he chose for his lecture, *The Value of a Line*, for there are so many kinds of lines. There is the *cheap* "line" at the linen-draper's, warranted "fast" as to colour. There is the antithesis to this, as exampled by the L.C. & D. Railway line. There is the clothes line, and the poetic line, &c. Mr. Blackburn's line is that mysterious thing which a pen charged with india ink will inscribe upon a piece of cardboard, the disposition and direction of which will determine the question whether a man is an artist or a duffer. Mr. Blackburn has had, perhaps, more opportunities of judging of the value of these ink lines than anybody else, for he is the compiler and originator of *Academy Notes*, those pleasing little handbooks which are illustrated by pen-and-ink sketches of the exhibited pictures by the artists themselves. The lecture was a pleasant one, given without farther reference to notes than was afforded by the pictures thrown on the screen, pictures mostly of pen-and-ink drawings by various artists more or less known to fame. The value of the electric lantern as a demonstrator was never better exemplified, the drawings standing out upon the screen with every touch of the artist's pen distinctly and beautifully rendered. Mr. Blackburn gave a pleasant little homily about each picture as it was shown, and was sparing neither in praise nor blame when deserved. A drawing by Mr. Pennell came in for both. It was a picture of the Market Hall at Yarmouth, in which the big black sail of a barge in the middle distance came in for much severe criticism. The examples were not all of the simple line sort, some of them being due to those embossed papers prepared for process artists which come under the head of scratch boards; that is to say, the paper or card is faced with a chalky compound, upon which are printed raised lines, which can be scratched or cut away to give the lights of the picture. Some of the work produced by this method is very effective, but it will at once be seen that, easy as it may look, it requires perhaps more artistic ability than the more laborious ink line to do it justice.

The discussion on Mr. Blackburn's paper was amusing, if not very valuable. It would seem that, directly the subject of "art" in any form is started at the Camera Club, there is fun to be looked for. It is a curious characteristic of human nature that a congregation of sane men should enter upon the discussion of a subject upon which they know, as a foregone conclusion, they will never come to agreement. So it was upon this occasion. One or two artists took Mr. Blackburn to task for showing sketchy pictures, which could not give a fair idea of a man's capabilities, as examples of a man's work. But we think Mr. Blackburn was quite justified in putting the sketches forward, as he really did, just as one might show a letter as a specimen of a friend's handwriting. Mr. George Davison gave Mr. Pennell's work a rubbing down, which it would have startled that genial artist to hear. Altogether the evening was a pleasant one, and Mr. Blackburn's half promise to lecture again at an early date was received with enthusiasm.

On December 5 Captain J. Thomson, one of Her Majesty's Inspectors of Explosives, entertained and instructed the Club with a lecture on the use and abuse of those compounds which have the unenviable reputation of dealing such widespread damage to men and things. Photographers as a rule—always excepting certain excitable members of the fraternity—are a peace-loving lot, and may therefore be supposed to regard explosives as somewhat outside their environment; and, if we were puzzled to find a reason for this lecture before a photographic body upon a subject foreign to them, we should search for it in the use of gun-cotton, and in the accidental manufacture of silver fulminate, which has occasionally arisen in experimental hands, even when sun pictures were the only results aimed at; but, in reality, no excuse need be found for the reading of an excellent paper upon a subject which interests all of us more or less, and which, moreover, was illustrated by several excellent photographs. The *Times*, in its notice of the lecture, says that it was illustrated by "dissolving views." This is very funny, and there is some excuse for this mistake, for actual explosives too often have been illustrated by "dissolving views," a well-known case in point being that of the two miscreants who hired a boat with the intention of blowing up London Bridge, and who were blown into such minute particles that not a visible fragment remained.

It was interesting to learn that, if any one wants to explode himself or any of his friends, there are about 1000 different mixtures from which he can choose the one best suited to his requirements. A quarter of a century ago there were not more than thirty, so that the modern operator has a far more extensive *répertoire*. The invention of gun-cotton, which did so much for the photographer of old, and is doing so much for him now in the manufacture of celluloid films, gave the great impetus to the science of explosives; and, although many are of the opinion that the world would be better without such terrible weapons, we must remember that industrial enterprise in mining, excavating, &c., has benefited enormously by the use of explosives. It is, indeed, difficult to imagine how the world could get on without them. With regard to their abuse, Captain Thomson had many interesting and well-executed photographs to show. These were chiefly views of places partly wrecked by dynamite bombs, taken under the auspices of the Home Office—an uncanny

memento of the reign of terror which we passed through only a few years back. Of course, the lecturer had something to say about that much-discussed indiarubber-like compound known as cordite; and it is a comfort to learn, after all the abuse which has been heaped upon this modern substitute for "villainous saltpetre," that it has been found to withstand extremes of temperature as well as the thunders of Chancery lawsuits, and that, on the whole, it is really a reliable article, without the terrible danger in case of accidental ignition which is inseparable from the older explosive. It seemed a pity that some contributor to the *P. M. Gazette*, which has its offices almost next door to the Camera Club, and which has so taken up the case of the alleged worthlessness of cordite, was not present to spar with Captain Thomson, for we should then have had some fun. But all was peace. No one was even blown up, physically or metaphorically, and the members of the Club rested in their beds that night just as if no means existed of landing them skyward.

Considering that it was so near Christmas, and considering also the abstruse nature of the subject, there was a fair attendance at the Club on the 19th, to hear Dr. Ackworth's discourse on the speed determination of plates. Perhaps it would be more correct to say that such a paper promised to be abstruse, for the matter was so clearly set forth by Dr. Ackworth that all difficulties of understanding it disappeared, and the time flew fast while he spoke, a sure sign that his audience were interested. It must be feared though that the great majority of workers care little about speed determination. They are content to buy the quickest plates which they can obtain, and leave the experimentalists to determine whether Jones beats Smith in the rapidity of his goods, or whether Robinson excels both. They will buy Robinson's if they hear that it has been definitely determined that Robinson's are the quickest plates in the market, but why they are the quickest, or by what method they are proved to be so, they care not one straw.

Dr. Ackworth commenced his paper by telling his hearers that this question of the determination of plate speeds was not a simple one, as some people might think. In reality it was a highly complex one, for so many factors had to be taken into consideration. This was shown by Captain Abney's paper some months ago, when he showed how much the temperature at the time of exposure influenced the results obtained. The primitive method of testing plate speeds was to expose two plates for the same period to the same light, develop and fix them with the same developer under the same conditions, and then to find out which plate showed the greater amount of deposit. He now showed two plates which had been thus treated, A and B, in which A was denser than B; but, by extending the time of exposure for both, it was seen that B became denser than A, and therefore this method gave contradictory results. It was clear, then, that we must not depend upon one exposure, but must submit each plate tried to several before we can obtain a just idea of its merits. We must remember, too, that a plate may have the capacity of giving great density although it may be comparatively slow in action; and here we have the reason for the apparent contradictory behaviour of the two plates just exhibited.

The lecturer then explained the action of Warnerke's sensitometer, and pointed out how it differed from Spurge's instrument. He also threw on the screen the results of exposing different plates under Warnerke's apparatus, and showed that, although one plate might be much quicker than another, the gradations were quite different when compared with one another.

Next the two systems of speed determination due to Captain Abney and Messrs. Hurter & Driffield were submitted to comparison. In both the plates were exposed behind a rotating sector, so arranged that different parts received measured periods of exposure; but, while Captain Abney used an amyl-acetate lamp as his luminant, Messrs. Hurter & Driffield preferred a standard candle. In the lecturer's opinion, the Pentane Argand lamp was superior to either as a reliable standard to work from. Working with the rotating sector, the plate, after development, shows four gradations, and each is subsequently carefully measured by means of a photometer. It might be remarked that in Captain Abney's experiments the negative had been regarded as a means towards an end only, but Messrs. Hurter & Driffield have regarded the negative as *the* important thing. The lecturer proceeded to show what an important factor was represented by fog on a plate, and he proved, by a series of diagrams, the amount of light stopped by: 1, the glass; 2, gelatine and glass; 3, fogged gelatine, &c. He then dealt with the question of development, and said that the nature of the developer employed exercises a very great influence upon the results obtained in speed determination. And here came a very interesting illustration of this important point, in the form of a plate which had been cut in three parts, one part being developed with ferrous oxalate, another with pyro-soda, and the third with metol-soda. There was nothing to choose between the two latter—they were, for all practical purposes, alike; but the portion developed with ferrous oxalate lagged far behind so far as density was concerned. It would have been interesting to have known what plate this was, for it is certain that ferrous oxalate, with some, will give as great density as it is possible to obtain. Dr. Ackworth also called attention to the remarkable difference in the colour of the deposit, by which the actual density in its value for printing purposes was much increased in the two plates developed by pyro-soda and metol-soda. This difference is not generally recognised in speed measurements.

There now followed a series of most interesting lantern slides which had been prepared by Mr. Charters White. They were photo-micrographs, which had been obtained from different unexposed plates, in order to show the grain of the emulsion under a magnification of 100 diameters. This was increased to about 3000 diameters on the lantern screen, and the brilliant electric light brought out the details of the slides with great distinctness. As might have been expected, the slow plates showed the finer grain, the best in this respect being a chloro-bromide plate. We were sorry that a pure chloride plate was not shown, for this question of fineness of grain is a very important one. We were also shown the mischief wrought by fog without exposure, and this interesting series of photo-micrographs brought the paper to a close.

As to the discussion, there was none. Mr. Warnerke tried to draw Dr. Ackworth by stating that, although the lecturer had very clearly explained the different methods of speed determination adopted by Captain Abney and Messrs. Hurter & Driffield, he had not told his hearers which was the better of the two. Mr. Warnerke thought that they had a right to expect an enunciation on this important point. But Dr. Ackworth would not allow any salt to be put upon his tail. He answered, in a guarded manner, that it was difficult to say which was the better of the two. Much might be said for both systems. There were so many factors to be considered, that he really could not commit himself to a definite reply. The Rev. F. C. Lambert, then, in a few well-chosen words, closed the proceedings, at the same time expressing the opinion, which most others shared, that Dr. Ackworth's paper was one of the most valuable ever submitted to the consideration of the Camera Club.

Our Editorial Table.

The Beernaert Lantern Plates.

Mr. Oscar Scholzig, of Dashwood House, 9 New Broad-street, has sent us samples of the Beernaert Lantern Plates which are being introduced by the E. Beernaert Dry Plate Company. With each box of plates is given twelve magnesium wires for making exposures, in addition to twelve masks and binding strips. The plates are issued in two series. Series E 1 is a chloride print-out plate, and it is sufficient to expose it in contact with the negative from ten to fifteen minutes, in direct sunlight, to obtain a rich red-toned fully printed out image. The slide need not be fixed or washed, but can be used direct in the lantern, or exhibited as a transparency, provided, as it is pointed out, it is not exposed to a very strong light for a great length of time. Recently, an hour's exposure to daylight was insufficient to degrade one or two plates that we printed out in this manner. It is a quick and convenient way of making a lantern slide for a special purpose, and, when time allows, the image can be fixed and finished in the usual way without undergoing reduction.

The series F 1 plates are for making slides by exposure and development in the ordinary way, and a number of specimen slides, so made, have been submitted to us showing that a perfect command over the colour of the deposit is obtained, the range extending from cold black to warm red. The plates have evidently been well and carefully made, and should be very popular with photographers undertaking lantern-slide work.

With reference to the Beernaert plates, Mr. Scholzig informs us that not only are the different kinds and rapidities of Beernaert plates all one price, but they have adopted a system of calculating the prices, strictly on the basis of the surface coated, only taking into consideration the extra cost of the very thin glass used for the smaller sizes, and of the very thick glass necessary for the very large plates. The basis price is 10*s.* per square metre, or 100*s.* per dozen square yards. Thus the large-size plates come remarkably cheap in comparison with the general run of prices. The Beernaert Company have put up thirty new machines for the production of their plates, films and papers of all kinds, and they claim to possess the only factory in the world capable of evenly and cleanly coating plates of any size, up to the largest sheets of glass that can be manufactured.

The Practical Photographer for 1895.

Bradford: Percy Lund & Co.

The bound volume of our contemporary, for 1895, makes an attractive book. It is full of tastefully chosen illustrations in half-tone, and the literary portion, under the careful editorship of Mr. "Matthew Surface," embodies a great deal of excellent photographic teaching.

News and Notes.

A SUBSTITUTE FOR GOLD.—A French journal describes a new and promising substitute for gold. It is produced by alloying ninety-four parts of copper with six of antimony, the copper being first melted and the antimony afterwards added; to this a quantity of magnesium carbonate is added to increase its specific gravity. The alloy is capable of being drawn out, wrought, and soldered just as gold is, and is said to take and retain as fine a polish as gold. Its cost is a shilling a pound.

GELATINE is transformable into a kindred substance, gelatose, or protogelatose, characterised by want of the property of forming a jelly, and of being precipitated by a standard solution of sodium chloride. In cultures of liquefactive microbia it is observed in the first moments that the gelatine is changed into gelatose. Gelatine loses the property of jellifying if left in contact with an alkaline chloride or iodide. With the fluorides the transformation is only partial. The change may be named saline digestion.—A. DASTRE and N. FLORESCO.

APPARENTLY, although Christmas numbers have multiplied tenfold, their popularity is still as great. The Christmas number of the *Windsor Magazine* was actually "sold out" on the day of publication, despite the enormous edition that was printed. *Apropos* of this, it was computed that, if the copies of the magazine were placed end to end, they would cover a distance of forty-seven miles. The great demand for the *Windsor* is probably partly due to the fact that with each copy is given a complete volume by Conan Doyle, extra to the diversified contents, numbering 224 pages.

MESSRS. LONSDALE BROS., of 22, Goswell-road, Aldersgate-street, E.C., write: "We have great pleasure in informing you that we have taken commodious and centrally situated premises (containing upwards of 5000 square feet) at the above address, which we are fitting up with the most modern machinery for the manufacture of photographic apparatus and camera brass-work. The establishment of works in the metropolis has been induced by the increasing growth of our London and export trade, and we believe it will be for the greater convenience of the majority of our customers, many of whom have parcels contracts with and pay periodical visits to London, when they will have the opportunity of personally inspecting our manufactures in our new showrooms.

THE Durham City Camera Club's Fourth Exhibition of Photographs will be held in the Shakespeare Hall, North-road, Durham, on Tuesday and Wednesday, February 18 and 19, 1896. Prize list for exhibitors. The following classes are for open competition:—Class I. Landscape or Seascape, any size or process. Class II. Portraiture and Figure Study, any size or process. Class III. Architecture and any subject, any size or process (other than Classes I. and II.). Class IV. Lantern Slides (set of 6). Eight medals (four silver and four bronze) and certificates are placed at the disposal of the Judges in the above classes. Entries close February 8, 1896. Entry forms and any further information may be obtained from R. Hauxwell, Hon. Secretary, The Avenue, Durham.

"SILVER is usually recovered from silver bromide wastes," says the *Scientific American*, "incident to photographic purposes, by mixing them with nine-tenths their weight of calcined sodium carbonate, and fusing in a crucible, whereby carbon dioxide and oxygen are given off. Metallic silver gathers at the bottom of the crucible, and a double salt of sodium carbonate and sodium bromide floats on top as a clear liquid. On cooling the crucible down to a red heat the silver solidifies, and the flux, still in a liquid state, may then be easily poured off. The silver thus obtained is of a fine white colour. The flux usually has an intense yellow colour, and still contains about ten per cent. of silver. The latter may be obtained (*Pharm. Centralh.*, xxxvi. p. 632) by mixing the flux with plenty of water and stirring occasionally to facilitate solution of the flux. The unchanged silver bromide is allowed to settle, washed by decantation, and presented for a subsequent operation."

THE South London Photographic Society's Seventh Annual Exhibition will be held at the Public Baths, Church-street, Camberwell, S.E., on Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday, March 2, 3, 4, 5, 6, and 7, 1896. The following are the open classes:—J, Pictures which have previously received an award; K, Pictures not previously medalled; L, Lantern Slides which have previously received an award (sets of six); M, Lantern Slides not previously medalled (sets of six); N, Process Work; O, Stereoscopic Slides not previously medalled (sets of four). The silver and bronze medals competed for in the above classes will be awarded at the discretion of the Judges. The Society's medals will also be awarded for the best trade exhibit, and for the most useful novelty in photographic apparatus. Entry forms and further information respecting the Exhibition can be obtained from Charles H. Oakden (Hon. Secretary), 30, Henslowe-road, East Dulwich, S.E.

SOUTH LONDON SOCIETY'S CONCERT.—In place of the usual meeting, the above held their second social gathering on December 16 last, when a large audience of members and their friends were present despite the elements. A programme had been arranged for by the Hon. Assistant Secretary, and the chair was occupied by Mr. Walter D. Welford. The proceedings commenced shortly after eight p.m., and were carried through the long evening by the chairman without flag or delay of any kind likely to mar its success. A pianoforte solo for the left hand by Miss Florence Fellows deserves special mention, as also do the flute solos of Mr. G. Ernest Stanger and the recitations by Mr. Snellgrove. The violin solos of Miss Fuller call for notice in her selections from *Faust*. The comic element was well sustained by Mr. Powell, Mr. W. C. Hansell, and Mr. W. C. Boyce, and the honours of assisting at the piano were well divided between Miss Stevens, Miss Winnie Boxall, and Miss Dickinson. Other songs by Mr. Mayo, Mr. Cass, and Miss Stevens, and the recitations by Mr. Utley and Mr. Dickinson all helped to pronounce the evening one of the most successful undertakings of the Society outside its photographic work.

LUMIÈRE'S PLATINO-MATT BROMIDE PAPER.—Messrs. Forest Bros. inform us that Messrs. Lumière are now manufacturing this paper in two grades—"A" for contact printing, "B" for enlarging. The latter paper is four times more rapid than the former.

PHOTOGRAPHIC SOCIETY OF IRELAND.—In connexion with the Exhibition of the Photographic Society of Ireland, which will be held in February, 1896, it is intended to have a special exhibit of photographs representing Irish scenery, historical and archæological remains, character sketches, &c. As this is expected to aid in interesting tourists in the beauties of Ireland, the Irish Tourist Development Association have offered 25*l.* to be awarded as prizes. Many lovely souvenirs of Ireland must have been obtained by amateur photographers who have visited the Emeral Isle, and it is hoped they will be induced to send specimens of their work to this Exhibition, and not only take part in a competition for valuable prizes, but at the same time support the object this Association has in view, and so assist in spreading a knowledge of the attractions of Ireland. The prizes consist of one prize of 5*l.*, one of 3*l.*, and one of 2*l.*, and thirty certificates to those pictures next in order of merit, to which also will be given a fee of 10*s.* 6*d.* for right of reproduction. Prize-winners must allow the reproduction of the winning pictures, and the name of the photographer will be attached to the reproduction. Value of prizes may be taken in medals, photographic goods, or cash. Pictures, which must be mounted, but need not be framed, must be delivered at 35, Dawson-street, Dublin, before January 31, 1896.

Patent News.

THE following applications for Patents were made between December 16 and 21:—

TRIPOD STANDS.—No. 24,078. "Improvements connected with Tripod Stands for Photographic Cameras and other articles." H. H. STANNUS.

DARK SLIDES.—No. 24,121. "Improvements in Photographic Dark Slides for Carrying Sensitised Cut Films." H. HODGETTS.

FOCUSSING APPLIANCE.—No. 24,124. "Focussing Appliance for Photographic Cameras." J. PEARSE.

PHOTOGRAPHIC BATHS.—No. 24,141. "Improvements in Means for Preparing Photographic Baths." A. MAROUBY.

CAMERAS.—No. 24,157. "Improvements in Cameras." Complete specification. H. CASLER.

LENSES.—No. 24,278. "Improvements in Photographic Objectives." Complete specification. F. R. VON VOIGTLÄNDER and D. KAEMPFER.

CAMERAS AND CHANGING BOXES.—"Improvements in Photographic Cameras and Plate-changing Mechanism for use therewith." C. OLIVER.

LANTERNS.—No. 24,388. "Improvements in or relating to Magic Lanterns." S. P. FRAMPTON.

CAMERAS.—No. 24,390. "Improvements in Photographic Cameras." A. A. SMITH and J. STUART.

SENSITISED PAPER.—No. 24,440. "Improvements in the Manufacture of Sensitised Paper suitable for Photographic Purposes." W. FRIESE-GREENE.

PHOTOGRAPHIC APPLIANCES.—No. 24,501. "Improvements in and relating to Photographic Appliances." G. LECOURT and J. BOVÉ.

PRINTING FRAME.—No. 24,521. "An Improved Photographic Printing Frame and accessories applied thereto." G. HOUGHTON.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

January.	Name of Society.	Subject.
6	Richmond	Lantern Evening. Members' Slides.
6	South London	*Hand-camera Work.* Walter D. Welford.
7	Brixton and Clapham	Seventh Annual General Meeting.
7	Gospel Oak	*Photographic Failures and their Possible Remedies.*
8	Croydon Camera Club	*Orthochromatic Photography Applied to Copying Paintings.* G. R. White.
9	Leigh	*Bromide and Platinotype.* R. Leigh.
9	Liverpool Amateur	Lantern in Use.
9	Woolwich Photo. Society	Lantern Night, for Testing Members' Slides.
10	Birkenhead Photo. Asso.	*Some Simple Optics' Laws.* The Secretary.
10	Ireland	*Views in Many Lands.* Miss A. C. White.
10	Oldham	Annual Soirée and Dance.
11	Bournemouth	Lantern Evening.

Richmond Camera Club.—December 23.—Mr. Arlaseer presided, and Mr. TAYLOR resumed his demonstration on the subject of

FRAME-MAKING AND PHOTOGRAPHIC CARPENTRY

by giving practical directions and showing the process of making various pieces of apparatus easily within the powers of an average amateur carpenter with a small stock of good tools. One of the most useful of the articles dealt with was a glass-bottomed dish, the construction of which was shown in detail, while examples of home-made tray racks, negative boxes, slide boxes, filter stands, &c., all thoroughly efficient for their purpose, were exhibited, and their mode of construction explained. This was the last meeting of the autumn session, and the Club adjourned until January 6.

Bath Photographic Society.—December 18, Mr. Aug. F. Perren (President) in the chair.

PORTRAITURE: PLATINO-BROMIDE PAPERS.

Mr. NAHUM LUBOSHEZ, of the Eastman Photographic Materials Company, London, attended, by invitation of the Society, and gave a most successful lecture and demonstration, entitled *A Talk about Successful Portraiture and Platino-bromide Papers.* He commenced his address by describing a picture in pure black and pure white, all intermediate tones being rendered as represented in a steel engraving. Certain photographic papers approached this condition very closely, as he proposed to show; but, in order to succeed, the operator must be master of his materials, and not allow the materials to control him. He claimed that, by an intelligent use of platino-bromide paper, the material was, or should be, under perfect control. He next spoke of the kind of developing solution most under control, and the power one could exert on a plate of ordinary speed, which was absent in the case of more rapid sensitive surfaces, when hazy shadows frequently supervened. The lecturer introduced the notion of varying the aperture of light in the objective during exposure, and showed an extraordinary example of work he had produced in this way. This was a huge enlargement by artificial light on a long sheet of prepared platino-bromide paper, showing pure black and all half-tones, and imprinted within a portion of the shadow was a twelve-inch contact print of the same subject. This was pronounced to be perfect. Numerous questions were asked by the assembly and satisfactorily answered, after which, by the aid of the black-board, Mr. Luboshez gave some valuable information on the subject of lighting in connexion with obtaining a successful portrait. He was careful to demonstrate the most suitable angle, and he inveighed against the practice of reflecting light from a false angle. At the conclusion of the lecture the CHAIRMAN heartily thanked both Mr. Luboshez and the Eastman Company for the pleasure the meeting had derived. He (the Chairman) had never heard so much valuable information given in one lecture.

Liverpool Amateur Photographic Association.—December 19.—A demonstration was given by Mr. G. A. CARRUTHERS on *Lantern-slide Making.* Mr. Carruthers showed the whole process up to the finishing of the slides in an exceedingly clear manner, and developed several plates in the presence of the audience. The demonstration was of especial interest at this time of the year, when lantern lectures, which of late years have come so much into vogue, are in full swing, and the popularity of these lectures, in their modern form, being largely due to the efforts of the Liverpool Society.

Plymouth Photographic Society.—December 20.

PLATINO-BROMIDE.

Mr. LUBOSHEZ described the process of enlarging on platino-bromide papers, showing a very splendid example of a head and bust, much larger than life size, and which had also, printed on the same sheet by contact, a print of the original negative. It was evident that in this mounting in juxtaposition every facility for comparing results was present, and it showed but little, if any, falling off in detail between the original and its enlargement. The purity of the whites and the velvety blacks left nothing to be desired. Mr. Luboshez fully explained the means of getting good blacks, by so timing exposures that development could be fully carried out, and not checked half way. He also made it clear how to get the utmost detail in the enlargement by means of varying the stops during the exposure, commencing with a small stop and increasing the aperture. The question of developers for bromide papers was also dealt with in a full and able manner, the lecturer's favourite being the ferrous-oxalate, on account of the definite character of its composition, the variations possible in its two or three components, and the perfect result obtainable. At this stage, on the question arising as to whether the lecturer should practically demonstrate the development of some exposed paper, it was unanimously agreed that far more would be learned by Mr. Laboshez continuing his lecture than by an experiment which could be watched by but few, and which would teach less than practical tests in one's own dark room. The lecturer then proceeded to deal with the subject of portraiture, which he illustrated on the blackboard, showing how, by defective and cross lighting, the features might be so distorted as to produce an unnatural effect, and he strongly advocated as a general principle that the direction of the rays of light be kept mainly in one axis, and distributed as required, but be not reflected. At the end of an instructive lecture, listened to with the closest attention by upwards of one hundred, Mr. Luboshez was accorded a hearty vote of thanks.

Photographic Society of Ireland.—At the last meeting of this Society, at which Mr. G. Mansfield, J.P., D.L., presided, and before a very large audience, a very interesting dual lecture, illustrated by lantern slides, was delivered by Messrs. H. Goodwillie and J. M. Keogh, the subject being

A TOUR IN NORMANDY.

The slides shown were excellent in every sense, and very uniform in technical qualities, and gave utmost satisfaction to every one present; indeed, the continual applause which greeted the pictures as they were shown on the screen was sufficient testimony as to their good qualities. These gentlemen are certainly to be congratulated on producing such superior work. The cameras they used were home-made, and were fitted with Taylor, Taylor, & Hobson's lenses, which were worked all through with the aperture at *f*-11; cut films were used for making the negatives. Over-exposure was what had to be guarded against, even in street scenes. Messrs. Goodwillie and Keogh started on bicycles, on June 23 last, from Rouen for Bernay, next day riding on to Falaise, passing through Lisieux; on the 25th from Falaise to Flers, thence to Avranches. On the 27th the ride was continued from Avranches to Mont St. Michel, from here to St. Malo, from whence the train was taken to Coutance. On the 30th they started from Coutance on their bicycles, making for St. Lo, and on July 1 they reached Caen, and next day rode on to Trouville, passing through Havre, taking in Fécamp, arriving on the 4th at Dieppe, where they remained the day, then crossing to Newhaven. At all the above-named places and along the route some interesting and fine photographs were taken. The cameras Messrs. Goodwillie and Keogh carried on their backs when not in use, and the films were placed in a small box under the saddles. From the photographic point of view, judging from the results shown, the tour was very successful, and from remarks gathered during the lecture these gentlemen appear to have had a happy time of it.

FORTHCOMING EXHIBITIONS.

1896.

February 27-29 ..... Woolwich Photographic Society.

March 2-6 ..... *South London Photographic Society. Hon. Secretary, Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.

,, 3-6 ..... *Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PAPER NEGATIVES.

To the EDITORS.

GENTLEMEN.—Like two of your correspondents of late, I have lamented the disappearance of Eastman negative paper and have been careful over my stock of it (made in March and May, 1886); but I think I have found a fair substitute for it.

I was examining the texture of a piece of Wellington & Ward's bromide paper with a strong magnifier, when I found that there was hardly any perceptible grain in it. So, knowing how rapid the paper is, I at once slipped a piece into my "N & G" camera and tried it in a fairly good light on Monday, December 16, giving an exposure of half a second with *f*-11. The negative developed in two minutes. From it I took a print on the same paper, wishing to test it for giving detail; I took another exposure a day or two after, very bad light and misty, giving the same exposure, I had rather to force the development which took five minutes, but I was quite satisfied with the result. I enclose the two exposures with prints from them, all developed with the Elstree formula of metol and quinol.

If I can get the same make of paper, I shall certainly use it for work larger than ¼ plate.—I am, yours, &c., E. HEALY.

THE SAFE LIGHTING OF DARK ROOMS.

To the EDITORS.

GENTLEMEN,—I was interested to read, in this week's number of your JOURNAL, an account of some exhaustive experiments bearing on the above subject. Many people object to the irritating glare of the ruby lamp; in fact, I know persons who are so unpleasantly affected by it that they will not use isochromatic plates requiring the use of this colour. I have been experimenting for some time with different media to discover a safe and pleasant light to work by, and can recommend one or two combinations which are at once non-irritating and remarkably safe (always supposing it to be understood that no light is absolutely safe, and that reasonable protection is given to the plate during the first stage of development). My tests were more rigorous than exposing the plate in the ordinary way to the window of the lamp. The plates were put into a printing frame in contact with the different media, and exposed to the light of a Bray's No. 4 fishtail gas burner, full on, at a distance of twelve inches from two to three minutes. In actual use the light would be several inches behind the window, and with such a large burner only turned half on. Also the plate would or should be held quite two feet in front of a large window, and not less than one foot if a very small one. In this way the light action would be reduced four to nine times. There is a thick paper, first used in Leeds and district, and now sold by photographic dealers elsewhere, called canary medium. It is a bright canary colour, and absolutely free from pinholes. It is apparently coloured by a lead chromate, and is incomparably safer than any of the golden fabrics. One sheet behind a piece of fairly deep orange glass (flashed is better than pot metal), and a gas or paraffin light behind, gives a sherry-coloured light, which is pleasant and safe. If sandwiched between orange and green glass, such as is used sometimes for printing thin negatives through (not blue-green), the light is a cool green and remarkably safe, though perhaps too dim for windows less than a foot square. A brighter light, and nearly as safe, will result from substituting orange fabric for the canary medium paper. I think if the fabric were not so full of pinholes it would be quite as safe. I can easily develop isochromatic plates by the light with ordinary care; but for rapid isochromatic plates a piece of yellow tissue paper, sandwiched between ruby and green glass, gives a brown light, safer than ruby glass or fabric, and with none of its irritating qualities. The safety of the combination is further enhanced by using ruby glass, flashed on one side with orange, or by the addition of an orange pane, with scarcely any appreciable difference in colour or intensity. In this case white tissue paper or ground glass will answer quite well in place of yellow. I would just remark that I have found very deep ruby glass by itself much less safe than some of the lighter varieties, as it passes violet light, and may be actually inferior to canary medium, though not admitting a quarter the light.—Trusting these remarks may be of use to some of your readers, I am, yours, &c.,

Leeds, December 21, 1895. A. A. PEARSON.

THE NEW "STIGMATIC" LENS.

To the EDITORS.

GENTLEMEN,—In your issue of December 20 you were kind enough to give a notice of this new lens. I will thank you to give publicity to the fact that this lens is the outcome of the investigations of my friend and colleague, Mr. H. L. Aldis, B.A., who will describe the lens on January 14 at the Royal Photographic Society.—I am, yours, &c.,

THOMAS R. DALLMEYER.

25, *Newman-street, London, W., December* 23, 1895.

THE TELE-PHOTO LENS.

To the EDITORS.

GENTLEMEN,—I should like, with your permission, to correct a slight mistake in the report contained in your last issue of my remarks on the tele-photo lens at the meeting of the London and Provincial Association. The mistake is perfectly unimportant as far as I am concerned personally, but it hardly does justice to the rapidity of this lens, which is one of the most useful tools ever put into the hand of photographers.

I allude to the statement that even with the exceptionally good light on the rocks of the Farne Island I had a difficulty in developing the plates, although the fastest obtainable, and was obliged to force the development to get passable results, the fact being that I had no such difficulty, every negative coming up easily and being fully exposed; the difficulty in obtaining fully exposed negatives was in photographing small birds among foliage, &c., in this neighbourhood, ten miles from London, where the light is acknowledged to be less actinic than it is round the coast.—I am, yours, &c.,

REG. B. LODGE.

THE ALUM BATH WITH COLLODIO-CHLORIDE PAPER.

To the EDITORS.

GENTLEMEN,—In reply to the inquiry of "St. Clair," in last issue of your journal, will you permit us to say that the alum bath for collodio-chloride paper has been for some time back recommended in our "instructions," a copy of which is enclosed.

The action of the alum is, of course, not on the collodion film, but on the enamel substratum, the softening of which has been an occasional, though not a serious, source of trouble. The alum bath, however, entirely obviates any such difficulty, and with its assistance this beautiful process becomes one of the easiest, as well as undoubtedly the finest, of all printing methods.—I am, yours, &c.,

PAGET PRIZE PLATE CO.,
per WM. J. WILSON.

[With reference to the use of alum, our correspondent writes further:—

But to return to the alum. A strong bath of this, for full five minutes previous to toning, and then washed in about three changes of water, will produce, with the matt paper and the ordinary Ilford sulphocyanide bath, a very fine, rich sepia tone, which I have been unable to produce by any other means. Why it should do this I cannot explain, the alum being presumably washed out.

I found this out by laziness, having one C.C. print and several P.O.P. to tone. I placed all the lot through the same process, with above result. I have since found that a stronger solution of alum and longer steeping gives better brown.]

THE SALE OF POISONS ACTS.

To the EDITORS.

GENTLEMEN,—The humorous letter of the learned Dr. Waller in your issue of the 20th ult. is capital. The important statement that he has read Mr. Hume's letter, "with approval," is overwhelming. Such a crushing argument ought to settle the whole matter finally. And the "legally qualified," who was so "severely rebuked" by the great man, *his* statement of the incident would be interesting, if available. In a city like Edinburgh there are probably chemists who do not know everything about photographic preparations, photographic dealers who do not understand the difference between carbonates and bicarbonates, and doctors who are not capable of diagnosing and treating a case of pyrogallol poisoning. There are varieties of the human race in all professions and in all occupations, and the "unready" variety is ubiquitous. Was not a learned editor, one of the ostensible fountains of all photographic knowledge and wisdom, once caught napping on the subject of hydroxyl-monohydride?

And again, when that immaculate institution, the Medical Defence Association, prosecutes a chemist for styling himself "Doctor," or for practising medicine without the necessary legal qualification, is the culprit discharged with an apology because some learned gentleman wishes to recommend him as such a remarkably clever man?

Not probably. The learned doctor would like his own title to be protected, and that of the chemist to be pirated. Exactly so; but the ramparts of the law are not likely to crumble at the skirl of the bag-pipes, even if the breath of a learned doctor is wasted in promoting the cheerful sound.—I am, yours, &c.,

PHARMACIAN.

HONOUR WHERE HONOUR IS DUE.

To the EDITORS.

GENTLEMEN,—I have read Mr. Ives's letter of December 14 with much gratification, and am pleased to see him hitting out straight in self-defence. I have followed his contentions as to the possibility of obtaining orthochromatic results on ordinary plates with deep interest, and think that, instead of attempting to ungenerously belittle his exhaustive researches, we should gratefully accord him the position to which, in my mind, he is honestly entitled, that of being the first to prove that it is possible to obtain orthochromatic effects on ordinary plates.

I am not at all surprised at the vigorous tone of Mr. Ives's reply to Mr. Punnett's letter (p. 735). My experiment with eurine, as obtainable in this country, prepared me for a warm retort which I was looking out for, and the latter part of Mr. Punnett's letter was an unworthy attempt to confuse the issue, if not to secure a cheap advertisement.

When your correspondents grasp the fundamental teaching of Mr. Ives's experiment that when experimenting with ordinary plates they must make sure they have a screen or light filter that cuts off the whole of the violet and ultra-violet rays, and not one which they imagine from its body or depth of colouring does this, then they may be able to contribute useful and instructive information.

I am also pleased to note Mr. Ives disclaims any intention of undervaluing the colour-sensitive plate of commerce. No one who has followed his writings on the subject could for a moment think he had any such intention. His object all along has been to show that with a suitable colour screen orthochromatic effects could be obtained upon ordinary plates as a scientific truth—a fact that has been emphatically denied—not that such plates and screens were the most practical for every-day work.

When a man gives such time and intellect as Mr. Ives has given to this subject for the enlightenment of his fellow-men, without thought of personal gain, he is entitled, not to the miserable carping criticism or reluctant admission, but our hearty, grateful thanks for teaching us something which we did not know before.—I am, yours, &c.,

Roundhay, near Leeds, December 30, 1895. F. H. BURTON.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

To the EDITORS.

GENTLEMEN,—Will you kindly announce that the London and Provincial Photographic Association will, in future, meet at the White Swan, Tudor-street, New Bridge-street, near Ludgate Hill Station?

The Association has secured more commodious rooms and will be pleased to see any visitors at its meetings.—I am, yours, &c.,

P. EVERITT, *Hon. Sec.*

PHOTOGRAPHIC SOCIETY OF IRELAND'S EXHIBITION.

To the EDITORS.

GENTLEMEN,—I enclose two circulars containing particulars of our forthcoming Exhibition, and would consider it a favour if you would kindly draw attention to it in your next issue, particularly as regards the Champion Class, and the special class for "Irish Pictures." Last year, much to our disappointment, only one picture came from England for the former class. We trust there will be a more general response on this occasion.

As regards the class for Irish pictures, you will see that we have in view the object of drawing attention to the many beauties of Irish scenery, and we hope our friends in England and elsewhere will help us in this matter by contributing largely.

You are therefore aware that the Irish Tourist Association mentioned is a body of well-known and influential men of all ranks, who, for purely philanthropic motives, have taken up the question of benefiting Ireland by attracting tourists. It is presided over by His Excellency the Lord Lieutenant, who is taking a great interest in the matter. Our Exhibition will be held under his patronage, and he intends to be present at the opening ceremony.

We expect a very successful Exhibition, and trust you will do all you can to help us. Apologising for trespassing on your kindness,—I am, yours, &c.,

JOHN A. C. RUTHVEN, *Hon Sec.*

Photographic Society of Ireland, 35, *Dawson-street, Dublin.*

A MOMENTOUS QUESTION.

To the EDITORS.

GENTLEMEN,—When is a man too old to be a photographer? It's my misfortune to have to seek a situation, and have answered numerous advertisements, and, although terms, specimens, references, &c., are all satisfactory, yet, when I say I am in my forty-sixth year, the answers are, "Sorry, but we prefer a younger man." A bright look-out for the younger men ten or twelve years hence!

In all other professions it seems as though a man is only considered at his best about forty or fifty years of age, but photography is such a laborious and learned profession, that it seems you're played out at that time of life; a nice sort of business to bring your sons and daughters up to. What becomes of old photographers?—I am, yours, &c. STRANDED.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon.*

DRY PLATES.—P. C. FREWIN. Kindly inform us where you obtained the formula, page, date, &c. We shall then be able to give you more definite information.

COPYRIGHT.—E. I. We cannot say definitely if there is any copyright in the picture now. It is probable there is not, though it is possible there may be under the International Copyright Law.

CAMEO PRESSES.—D. RICHARDS. Cameo presses are supplied by all the photographic dealers. If a special die is required, it will have to be made to order; but there will be no difficulty about that.

BRASS TYPE.—D. H. HOGG. Most of the large typefounders in London will supply brass-faced type, we surmise. That will answer the purpose as well as solid brass type for the purpose you require.

PRINTING.—WILTS. The trouble has, doubtless, been due to the use of too weak a sensitising bath. Twenty-five grains of nitrate of silver to the ounce of water is not nearly strong enough. Double the strength at least. Where did you get the formula from?

ARUNDEL SOCIETY.—A. B. says: "Would you be good enough to say if you know of a Society called the 'Arundel,' that does something in the way of coloured pictures (copies of the old masters) at a cheap price? If so, please state address."—In reply: The address is 19, St. James's-street, S.W.

WRITING ON BLUE PRINTS.—W. JEFFERSON writes to know how he can write on blue prints so that the letters shall be white on a blue ground?—In reply: Use a dilute solution of carbonate of soda (the strength is not very material), and rinse the entire print once or twice in water after having written.

FLASHLIGHT.—W. WARD. The mixture will give a brilliant light, but we should advise you to be very careful in compounding it. The ingredients should be dried and pounded separately, and then mixed with a boue spatula. We should advise that they be mixed only in small quantities, and at the time of using. Why not adopt one of the many magnesium flash lamps now in the market?

GELATINE FOR MOUNTING PRINTS.—W. WOODING inquires whether "any particular gelatine should be employed for mounting purposes?"—In reply: The commoner kinds of gelatine, manufactured for culinary purposes, are more suitable than those used by emulsion-makers, since the latter are generally more or less acid. Nelson's X opaque or No. 2 soluble will be found to answer as well as any.

SENSITIVE BITUMEN.—D. D. asks if the bitumen which is sensitive to light "has to be kept in the dark when in the lump?"—In reply: This seems to be immaterial. We have employed successfully some taken from a cartload being used for the paving known as Val de Travers. It seems, when in this condition, to be very little affected by light, although, when spread out in a thin film, it is soon affected.

SHOW-CASE.—S. W. C.—Your customer has good cause to complain of her portrait being put in the show-case, and it should be removed at once, and an apology tendered without delay. If the threatened legal proceedings are instituted, you will probably find yourself in an unfortunate position, not only on account of the law costs, but damage to your business, through using your sitters' portraits for your own purpose.

LANTERN.—J. E. DODSON says: "I have a four-wick lamp to my lantern, and I have been recommended to put some lumps of camphor and "albocarbon" in the oil, as it is said to improve the illuminating power. Is that so?"—It is said to do so, but we have not had sufficient experience with oil lamps with these additions to give a decided opinion. Perhaps some reader who has made comparative experiments will give his experience.

ADDRESS WANTED.—F. COPLEY says: "In THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1892 (page 579) there is an article by G. J. Clarke on *The Collodio-bromide Process*, in which he says that, if we apply to him, he will let us know where to get the emulsion that he recommends. If you could possibly let me have his address, I should be very grateful."—In reply: The address required is, or was, 52, Queen's-road, Finsbury-park, N.

HALF-TONE BLOCKS.—S. DAVIES. The only help we can give you is to tell you to get a properly ruled screen, such as that now used by the best process workers. Wire gauze is not the slightest use, if such work is desired as that turned out by the two houses mentioned. As you say, ruled screens are expensive, so are many other things in connexion with photography—lenses, for example—but they cannot be done without, if the best results are the chief consideration.

LENS.—C. S. asks: "Will you kindly inform me which type of lens you would recommend to take animals for subsequent enlargement on half-plates only, focus, about fourteen inches. I am hesitating between the following three types—(1) euryscope; (2) rectilinear; (3) single lens?"—Either of the first two named will be the best type to employ, on account of their rapidity. No. 1 will be the quickest acting when worked with its full aperture.

LANTERN SLIDES.—T. W. The albumen process has been published many times, and the results it yields are very fine. Ready-prepared plates are not made commercially, as are those of gelatine. If you want to work the albumen process, you will have to prepare the plates yourself. There is quite as much to learn in working the albumen process sucessfully as there is in the wet-collodion process. If you consider the one too troublesome, we surmise you will not think the other less so.

ENLARGING.—S. LAW says: "I have a lantern, fitted with a portrait lens as the objective, with four-and-a-quarter-inch condensers. Will this do for enlarging from quarter-plate negatives? The lantern was made by ———, whose lanterns are considered amongst the best."—The condensers will not be large enough if the whole of the subject has to be included. However, they will do quite well if only a portion of it is required, say, about three by two and a half inches.

STEREOSCOPIC TRANSPARENCIES.—W. MCLEAN says: "Will you oblige by saying whether it is or is not necessary to cut and transpose stereoscopic transparencies on glass to get the desired effect of relief in the slide when printed from the negative, or if there is any method of printing without transparency?"—In reply: It is not necessary to cut the transparency, provided (1) the binocular negative be copied in the camera, or (2) a suitable printing frame be employed. See the ALMANAC for 1887, where both methods are fully described.

STRIPPING FILMS; STAINS.—B. T. says: "I want to strip the film off some negatives to insert another figure. Will any acid do it? I have tried one or two, but they tear in places. I put some negatives by a stove to dry, and some water ran out of the pipe and splashed the negatives. The colour was like tobacco juice. It has stained one valuable negative. Can anything remove it? I have tried two days' soaking in water."—The best acid to use is hydrofluoric. With that the films will strip readily. Unless we know the colouring matter in the water, we cannot say what will remove it.

LENS.—J. FRASER says: "My nephew has bought a whole-plate portrait lens, on which is engraved, on brasswork, 'M. P. Tench, 153, Fleet-street, London. 1373. No. 4 portrait.' As I have not seen any advertisement in the JOURNAL or its ALMANAC of this firm, will you kindly tell me if it still exists, and if you can tell me if these lenses were considered good in other days, and the price of them when issued by the firm. The lens is three and a quarter inches diameter?"—The house does not now exist. Some of the lenses issued by it were very good, though they were not all of equal quality. We do not remember the prices charged, it is too long ago.

COPYRIGHT.—PURCHASER writes: "I bought a framed photograph in a picture gallery the other day for five guineas. Can the photographer sell further copies, and so depreciate the value of my own, or can I stop him? It seems, when so high a price is paid for a small print (whole-plate), there ought to be some guarantee that numbers will not be subsequently put on the market at a cheap rate."—In reply: Unless you expressly stipulated for, and secured, a transfer of the copyright to yourself in writing, you can do nothing. Certainly, as you say, the price was a big one, and, although you have not the slightest legal right in the matter, a scrupulous photographer would be unlikely to act in the way you suggest.

SPOTS.—PUZZLED writes as follows: "Could you kindly help me to find the cause of spots on enclosed platino print? The mounts are ———, and similar to what I have been using for past three years; the mountant is Glenfield starch, made fresh each day. I use pure hydro-chloric acid, one to sixty, and pass prints through six separate baths, five minutes each. I have prints on view in a very strongly lighted window, with sun and steam to contend with, which have stood the test for over three years. This print (and several others) has only been done three weeks, and shows these spots. I can only think it careless work by printer not moving prints in acid, and air bells adhering to prints, and leaving a particle of iron, to change by light action."—The spots appear to be of iron, but not produced by careless manipulation as suggested. We should rather suspect they are particles of iron rust in the washing water. Such particles are frequently met with, and in abundance at times, in water that has passed through iron pipes, main or service.

RESIDUES.—J. M. writes as follows: "I bought a quantity of residues as a speculation (about eight pounds), most of which had all the appearance of chloride of silver. This I dried, pounded, and sifted, as I have seen recommended in the JOURNAL. I sent a sample to two different refiners for an estimate of what they would give for it. In each case the sum was about the same, and very small, as they said there was little silver in it, the bulk being chiefly kaolin. On complaining to the photographer from whom I bought the waste, he told me that he used kaolin for clearing the silver bath, and that which I thought was chloride of silver in the filter papers was, no doubt, mostly kaolin. He will make me no recompense. Can I recover something in the County Court?"—No, unless the solid matter was said to be chloride of silver. Kaolin is generally amongst photographic wastes where the paper is sensitised at home. You say you bought the stuff as a speculation, and it has clearly turned out a bad one; but you have, so far as we can see, only yourself to blame.

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EX CATHEDRÂ.

Dr. P. H. Emerson's last book, *Marsh Leaves* (London: David Nutt) is a beautiful production as books go, but in some essentials it is disappointing. It may best be described as a series of word vignettes of nature and character in the East Anglian fens. Here and there the author's prose paintings are so realistic that we seem to breathe the very air of the scenes he describes. Notably is this so of the chapters headed "A Moonlight Midnight," "First Voice of Spring," "Return of Spring," and "A Nocturne," which attest both Dr. Emerson's accuracy and minuteness of observation, and his skill in delineating the smallest details of his subjects.

* * *

Humour, pathos, and human sympathy distinguish the chapters in which the author deals with character as found in fenmen, wherrymen, and marshmen. Dismissing several chapters in which the scenes and incidents handled are either commonplace or inconsequential, it struck us that, were Emerson to devote himself to fiction, he would find congenial work in doing for East Anglia what Blackmore has done for Devonshire and Cornwall, and what Thomas Hardy has done for Wilts and Dorset, that is, to make the country, with its customs, manners, dialect, and character, the background of a series of fine novels. His obvious powers, in combination with the years of patient observation he has expended, mark him out for such an undertaking.

* * *

There are "sixteen photo-etchings from plates taken by the author" to illustrate "Marsh Leaves," possibly photogravures, but looking not unlike collotypes on plate paper. The frontispiece is "A Winter's Sunrise," an enlargement of which, we believe, was shown at the last Exhibition of the Royal Photographic Society. We may instance the "Lone Lagoon," which shows two little bits of tree-topped shore surrounded by a monotonous area of faintly inked paper, as an example of some of the illustrations that might, on account of their unintelligibility, have been omitted; on the other hand, "A Winter Pastoral" and "Bleak Winter," two snowy landscapes with gaunt trees, the atmosphere of winter brooding over scenes of dreariness, are in the author's best manner. "Marsh Leaves" is an uneven but an interesting book.

* * *

Messrs. Marion & Co., of Soho-square, ask us to state that they are open to receive designs for Christmas and birthday-greeting mounts for midget, *carte-de-visite*, quarter-plate, cabinet, and half-plate photographs. They are willing to give from ten to thirty shillings each for the designs. They also want original photographs of landscapes, seascapes, animal pets, &c., the prices of the negatives to be agreed upon. Designs and prints may be submitted to Messrs. Marion & Co. up to the 30th of the present month.

* * *

Several correspondents have lately written us urging manufacturers to resuscitate paper, coated with gelatine emulsion, for negative work. The Rev. E. Healy last week forwarded us two negatives, with the prints from them, on Messrs. Wellington & Ward's bromide paper. Both sets of negatives and prints are very good, but the negative of the architectural subject—the entrance doorway of a house—has rendered the detail with surprising fineness. For large work it is quite likely that a demand worth considering for negative bromide paper would spring up if it could be satisfied. We may add that Mr. Healy's negatives were not made translucent, though they might have gained from such treatment.

A CORRESPONDENT, who is a professional photographer, recently asked us a question with reference to photographic copyright, and was answered in due course. We also referred him to the Photographic Copyright Union, of which, when writing to thank us for the information given him, he said he "knew nothing." Our friend's ignorance cannot be ascribed to lack of effort on the part of the Union officials to make that body known throughout the length and breadth of the land, or to our own silence upon the subject. Lest, however, any others of our readers may be in the same unfortunate position, we urge them and all photographers to add to their new year's resolutions that of becoming members of the Union. The name and address of the Secretary is Mr. H. Gower, Photographic Copyright Union, London Chamber of Commerce, Botolph House, Eastcheap, of whom all particulars may be obtained. The unfriendly attitude taken up by a section of the illustrated press in the course of the *Times* correspondence last November, as well as subsequent indications from the same source, justify us in adding extra emphasis to the recommendation we give all our readers to join the Union forthwith.

* * *

QUITE a competition among plate-makers has sprung up in the invention or selection of distinctive names for their various brands of plates. Such names as convey the idea of rapidity, of emulsion, or exalted quality, are in particular request. The newest plate issued comes from Messrs. Mawson & Swan, and it is named the "Electric" plate—a very happily chosen title.

* * *

SOME years ago, a British officer in Burmah, if we remember aright, allowed a photograph to be taken of a military criminal at the moment of the latter's execution. Public sentiment condemned the act which allowed the doomed man to know that the manner of his miserable end afforded an amateur photographer the opportunity of indulging in a little morbid amusement. As neither science nor morality could be served by such an application of photography, the act was undoubtedly indefensible. But what are we to say to the latest, and certainly the most painful, use to which photography has, within our knowledge, been applied? Here are the particulars, for which we are indebted to an American contemporary.

* * *

"EARLY in November, a terrible crime was committed by a negro fiend, near Tyler, Texas, and he was soon captured by a deputy sheriff, but on the way to prison was taken from the custody of the officers by an infuriated mob, who dragged him to the public square of Tyler. An iron rail was planted in the centre, to which the negro was chained and burned to death, the husband of the murdered woman applying the fatal match. A curious feature of this horrible affair was the impressment of the local photographer to photograph the scene; the result was a series of six pictures, which form a modern human document of force and intensity. Picture No. 1 shows the capture of the prisoner at Kilgore. In the foreground are seen the deputy sheriffs who had him in charge, and from whom he was forcibly taken a little while after this picture was made. The crowd demanded that Hilliard stand for his photograph, and the idea seemed to please him, for he imagined that it was a grand and good thing for a negro to be made so much of.

* * *

"THE second photograph shows the prisoner in the little waggon in which he was eventually carried to Tyler. On the front seat, with his head turned so that his eyes are riveted upon the black brute who despoiled him of his treasure, sits the heart-broken husband. On the rear seat with the prisoner is ex-constable Meadows, who was prominent throughout the entire affair. The waggon, when this picture was made, stopped along the road near the scene of the murder, and afforded Mr. Irons opportunity to make his negative. During the taking of the picture Hilliard sat as rigid as a statue, and remarked that he had never seen a good picture of himself, and wanted this one to be a perfect likeness.

* * *

"THE third exposure was made when the cavalcade escorting the prisoner reached the public square of Tyler. He did not pose in this picture, and took no interest in it, even if he knew it was being taken. The fourth plate was made just at dusk, when a drizzling rain began, and shows the culprit on the improvised scaffold. In the fifth plate, which is a particularly striking photograph, the condemned man is seen, surrounded by his captors, praying. He was again triced up with heavy chains, and the photographer prepared to make another plate. The sixth illustration of the series was made after the enraged and distracted husband applied the match. The picture shows the beginning of the fire that consumed him, and when it was taken there were four or five thousand men, women, and children standing in the square, or occupying seats of vantage in the second-story windows or upon the substantial frame and iron awnings that prevail in every Southern town. Night had set in by the time the fire was fairly started, and photography was out of the question."

* * *

IN a country where Judge Lynch is more powerful than the official dispensers of justice one cannot be surprised that the conventional niceties of civilisation are occasionally ignored; but those who live amid calmer and more orderly surroundings may well be pardoned for wondering whether, in the case cited, the complaisant callousness of the horrible negro, the fury of the mob, the cool determination of the officials, and the willingness of the photographer, were not, in combination, responsible for subjecting the photographic art to a use so debasing and brutal as to be without a parallel.

HOW TO GET THE BEST VALUE FROM A NEGATIVE.

WE have on previous occasions referred to modern printing methods, and our present remarks will be, to some extent, supplementary to what we have before written. The growth of new printing processes has been so conspicuous, and the subject is of such great importance, that we have not deemed the trouble too great to make extensive inquiries in many directions as to the plans adopted by various workers. It is no part of our present plan to indicate any particular sort of paper as being better in artistic value than another. Granted the need to print a number of copies from a set of negatives, we wish to indicate the consensus of our correspondents' views as to the best way to do it.

Of course, if it is desired to have, for example, platinotype prints only, the printer will simply do his best with the material according to his experience. Even here it will be found that considerable range is within his power. If his negative is

weak, he will use the newest paper he can obtain; much more contrast will be given with paper a day or two old than with that kept a month or more. Such paper should be chosen for plates with images of full density. Then, if he desire the coldest tones, he will use a phosphate in his developing solution; but, if a browner shade be desired, oxalate only will be the best to employ.

Turning now to silver prints on glossy paper, the range of results is found to be varied to a most remarkable extent, and able to accommodate negatives of most widely different characteristics. As we need not point out to those used to printing from a large number of plates, the density, granting a fairly good range of gradations, is the main factor in governing the quality of the printing results. If the photographer be wedded to a particular kind of paper, he would naturally aim at getting negatives of a calibre best adapted to its peculiarities; but every practical man knows the difficulty in getting them with a close approach to uniformity; notwithstanding every care, some will be too thin and others too dense. Then to the one-process man so much the worse for his prints. But, if he be cosmopolitan in his tastes, and content to use any process that will give a good result, he will have a far better average of technical quality.

Let us suppose that albumenised prints will be made, and negatives aimed at that will best suit that method. Some negatives will be too thin. Most of us are familiar with the plan that professional photographers used to adopt under such conditions: they simply contented themselves with a very warm-toned print, one that had, as it were, only been shown the toning solution. The loss of due contrast was far less conspicuous than if a purple tone were aimed at, for the latter colour was merely presented as a muddy, non-descript colour, inartistic and offensive to the eye.

All this is now changed. An extremely thin negative will give an excellent result with gelatine printing-out paper, and a still thinner one may be used with collodio-chloride paper. But these prints do not exhaust the possibilities of refinement in the direction we are writing about. All brands of collodion paper are not alike. English makes will give good prints from a weaker negative than is permissible with foreign brands. Next in the scale of increased contrast come the gelatine papers. They also give admirable prints from negatives too thin for albumen. So clearly is this now seen that the manufacturers of this printing medium make papers adapted to various densities in the printing plate—papers to give a comparatively soft or hard character. One or the other will then be chosen, according to the depth of the *cliché*. This alternative puts a vastly increased power in the printer's hands. There is another possibility of great value in these new papers. We refer to the beautiful way in which they render the delicate *nuances* of shade in white draperies and laces. A negative that with albumenised paper will give perhaps one or, at most, two tones will give an almost infinite variety of the most delicate shadows to an extent that is a complete revelation to those not already familiar with them.

We may now set up a sort of scheme embracing the various points we have discussed. The hypothetical set of negatives we set out to print from will embrace all varieties of densities —dense, medium, thin, very thin, the faintest possible to get fair prints from. The papers to be chosen will be as follows (understanding that an exact line of demarcation is not attempted to be drawn):—First will be albumenised paper, next soft printing gelatine paper, then hard P.O.P., foreign collodio-chloride, and, lastly, English-made collodion paper. This brief rough sketch is only an indication, but our readers may rest assured that a scheme of printing modelled on these lines will permit excellence of results far beyond that attainable by adhering to a single printing basis.

The Presidency of the Royal Photographic Society.—We understand that a wish has been expressed by many members of the Royal Photographic Society that, in succession to Sir H. Trueman Wood, who retires next month, Captain Abney should be elected President. We learn further that Captain Abney has already been nominated for election by some of the oldest and most influential members. Captain Abney's fitness for the position is, of course, universally recognised, and his election would, no doubt, be welcomed by the Society at large.

Patents in 1895.—The number of patents applied for last year was 25,053. This is a decrease on the number for the year before by over three hundred. Until last year there has been for many years past a steady annual increase. In 1890 the number was 21,303; 1891, 22,872; 1892, 24,166; 1893, 25,102; and 1894, 25,372. Our weekly columns have shown that there has been no lack of applications for patents in connexion with photography during the year that has just expired. Although 25,000 patents were applied for, nothing like that number will be completed, possibly not one tithe. Prior to the present Patent Act, the provisional specifications lodged with the applications were published whether the patent was completed or not. Now the case is different. Unless the complete specification is accepted, the provisional is not published, and the public have no means of knowing what the application was for except from the title.

Death by Cyanide of Potassium.—It is not often, of late, that we hear of poisoning by cyanide of potassium. Yet there have now been no less than three deaths from it recorded within a few days of each other, all self-inflicted. In two instances the deceased were photographers, and in the other, one connected with electro-plating, an avocation in which the cyanide is used in much larger quantities than it is in photography. At the inquest on the latter the post-mortem examination, it is stated, showed that the deceased had taken sufficient of the poison to kill twelve or fourteen persons. In former times there were more suicides by cyanide of potassium than there are now, but they were almost entirely confined to photographers and electro-platers. It is not the restricted sale of the salt—under the Poisons Acts—that will account for this, for both photographers and electro-platers can obtain it at will, as they always could, and it was rarely used by any one else for suicidal purposes.

The Pharmaceutical Society again.—This, at times, energetic trade protection body has been at its prosecutions again, notwithstanding the snub it recently got in the Glasgow Sheriff's Court. This time it has given our Cambrian friends a turn—though not photographic dealers. At Rhyl, on Friday last, a grocer was mulcted in two penalties and costs for selling patent medicines containing morphine. The defendant pleaded ignorance, and well he might of what "patent medicines" contain. It would be interesting to learn how many pharmaceutical chemists know the composition of the quack nostrums they sell any more than does the grocer. It would also be interesting to know how often the duly qualified comply with their own Act by labelling as "poison" all the drugs they sell which contain the scheduled things. For example, how often is "paregoric" labelled poison, yet it contains a quarter of a grain of powdered opium in each fluid drachm. However, the above and previous convictions show that pharmaceutical chemists are duly qualified to sell quack medicines, of which they do not know the composition, in sealed bottles, secured with a Government stamp, and that no one else is.

Colour Reflections.—A novel lawsuit has been instituted in Paris before the Civil Tribunal. It appears that an advertisement agent, who has an establishment in the Rue Montesquieu, recently had the whole of the front of the house painted a brilliant red. The neighbours on the opposite side of the way—a milliner, a jeweller, and a silk merchant—found that the reflection of that colour prevented their customers from properly distinguishing the colours of their wares. Consequently they have brought an action for damages to the extent of 5000 francs, and to compel the defendant to have the house painted another colour. The latter maintains that he has the right to paint his house any colour he may choose. In the end, the Court deferred giving its decision till next week. One can quite imagine the effect that a reflection from a bright red house, with the sun upon it, would have on photographs in an opposite window, particularly if they were coloured ones, and the effect would be still greater in the case, say, of coloured ribbons and the like. It will be interesting to note the way judgment goes. Houses painted in bright colours are not altogether unknown in this country, and a similar case may arise here some day.

A Concession.—Those who have had any experience in Russia with a camera are fully aware of the difficulty there is in obtaining permission for its use, and, even after that is obtained, the risk the photographer runs of being arrested as an evil-doer. However, in view of the coming coronation of the Czar, the authorities have decided to organize a "Press Bureau" to help the correspondents, artists, and photographers employed by Russian and foreign newspapers to report upon, and illustrate, the pageants, &c., attending the crowning of the Czar. The managers of foreign newspapers are to apply, in the first instance, to the Russian embassies of their respective countries to obtain the necessary certificates for their representatives. The applications are to be accompanied by photographs of the various correspondents. These the embassies will forward to the home authorities. Certificates, bearing the seal of the Russian Chancellery, and the other insignia giving the bearers permission to attend the coronation, and to pass freely, excepting on certain specified occasions, will then be duly handed to the press representatives at the opening of the coronation ceremonies. This is a great concession for Russia to make, where the press is so much under restraint, and photography out of doors almost prohibited.

Made in Germany.—Our readers, like ourselves, have, doubtless, been the recipients of a goodly number of Christmas and New-year's cards as usual. Most of us have probably been struck by the fact that a large proportion of the best and most artistic of them bear the imprint, "Designed in England, printed in Germany." Is this not humiliating? It simply means that English art is satisfactory, but English printing is not, otherwise that part of the work would not be sent abroad for execution. We have on several occasions referred to the fact that English printers are behind the Continentals in the matter of fine printing, as well as in colour work. The English printers are very conservative, and will not adapt themselves and their appliances to modern requirements. Hence modern processes—of which the finest process blocks may be taken as an example—suffer at their hands, and will not, as a rule, compare with those printed on the Continent or in America. But "'tis true, and pity 'tis 'tis true."

Anent Christmas and New-year's cards, it is a matter for congratulation to find that each year photography is coming more and more to the front in their production. It is now some few years since we first advocated that photographers should utilise their art for this class of work, and it is pleasing to find that the idea has taken such deep root, and is now so flourishing. Not only is it used for portraiture and views of local scenery, but for the reproductions of paintings. It is also gratifying to see that, except for portraits, the evanescent silver printing processes are but little used, platinotype and the mechanical ones being those chiefly employed; amongst the latter, collotype and photogravure figure largely, the last-named especially. Some cards we received were charming little pictures produced by photogravure.

Carbon Enlargements without Transfer.—As a further contribution to the recent literature on the subject of carbon printing without transfer, an old friend sends us a reference to the ALMANAC for 1887, from which it would seem that the Artigue Papier Velours, to which reference has been made more than once by Mr. Alfred Maskell, is not an absolute novelty, as something which seems practically identical with it was in use in America nine years ago. At page 133 of the volume named will be found an article by Mr. W. H. Sherman, of Milwaukie, Wisconsin, in which the following description is given of a process in actual use in his town for the production of permanent enlargements in carbon. We may add, from our own knowledge of the invariably practical character of Mr. Sherman's contributions, that the mere fact of his speaking well of the process is an argument as to its value. Here is an abstract of his description :—

"Gelatine, refined lamp-black, bichromate of potassium, and water are mixed in suitable proportions, and brought to the requisite degree of fluidity by means of a water bath. The mixture is then applied to drawing-paper, in the form of a fine spray, through the medium of an air brush, the success of the printing operations being said to depend upon the granular form of the coating that results from this mode of application, which not only permits the light to penetrate to a sufficient distance, but also allows development to proceed without loss of the middle tints. The pigment dries quickly, and the paper is then ready for exposure in the solar camera, the sensitiveness being from five to ten times as great as silvered paper. For development, the print is wetted and placed in an upright position on a stretcher covered with muslin, and water, under considerable pressure, is showered on it through a hose connected by a short hose to a double faucet supplying it with both hot and cold, temperature and pressure being under easy control. The print is finished by washing to remove the last traces of chromium salts, and, after mounting, is entirely free from gloss, and possesses an admirable "tooth"—owing to the method of preparation—for the reception of crayon, ink, or water colour in finishing." For the latter purpose a neutral grey pigment was used, instead of black, and Mr. Sherman closes his description by saying that "many artists of experience, whose practice had long been confined to enlargements produced by other methods, are now using these exclusively."

This description tallies very closely with that given some weeks since by Mr. Maskell as the method by which the Artigue paper is supposed to be made and the details do not present any serious difficulties to those desirous of experimenting in this direction. Much, of course, depends upon the proper proportioning of the ingredients of the pigmented mixture, especially upon the colouring matter being in a sufficiently fine state of division not to clog the spreading apparatus. This being seen to, with the aid of the air brush, or, failing that, one of the simple forms of apparatus sold for diffusing perfumes or insecticides, and a little care and manipulative skill, there should be no trouble in applying a tolerably even coating of the mixture to paper or any other support.

A Simple Double Transfer Carbon Process.—It has already been pointed out that the method of carbon printing without transfer, recently described by Mr. Valentine Blanchard, results, like the ordinary single transfer method, in a reversed print. Here is a simple method, which, if carefully worked, will give a non-reversed picture without the extreme difficulties and uncertainties of the double transfer. In this case, the printing is done upon the pigmented side of ordinary tissue, which is coated either before or after sensitising with a film of transfer collodion. This, although stout enough to preserve the finest tints of the proof from damage, is scarcely sufficiently so to obviate the necessity for some kind of support during development, and therefore involves a process of mounting and unmounting, which, however, present no mechanical difficulties, and do not in any way jeopardise the print.

The coating of collodion may be applied to the surface of the tissue, either before or after sensitising, by pouring on in the usual

way; but, owing to the refractory character of the tissue, it will present some little mechanical difficulty to the inexperienced. Or the tissue, after sensitising, may be squeegeed on to glass previously coated with collodion, and if a thin film of gelatine or albumen be afterwards applied so much the better. This plan, of course, involves the necessity of drying in contact with the glass, which is a slow process, but, beyond that, is without fault. The tissue is simply stripped when dry, and then presents a most perfect surface for contact with the negative. This surface, it will be observed, will be the final surface of the print, so that there is no reversal.

For development, except of very small sizes, it will be almost compulsory to resort to some form of mounting in order to prevent damage to the tissue; but this may be similar to the plan followed with Swan's original tissue, that is to say, the collodion surface may be squeegeed to paper coated with indiarubber solution, which is easily removed after the print has been developed and transferred to its final support. Flexible support may also be employed in the usual manner, and, although the process is apparently a double transfer, it is entirely free from the danger that exists with the bare or uncollodionised tissue of the finer tints remaining fixed to the temporary support. With small-sized prints, not exceeding quarter size, we have often developed the collodionised tissue by simply laying it, collodion side downwards, on a piece of moist blotting-paper; but, if the object be to work with a minimum of care, we should advise the use of one of the mounting methods. The manipulations otherwise are precisely similar to those with ordinary tissue.

LETTERPRESS PRINTING BY PHOTOGRAPHY.

In the month of February, 1890, a photographic journal, commenting upon Mr. Friese-Greene's camera for the rapid taking of consecutive photographic views, remarked that "the chief value of the machine, or of a modification thereof, may hereafter be found to be in the direction not contemplated by the inventors—at least, they have said nothing on this point—namely, in the printing of positives for book illustration, for in positive printing through a negative the amount of light can be made to vastly exceed that present in the photographic street views, so that the limit of speed, especially with improved machines as yet unborn, is at present beyond calculation. One can imagine the possibility of a practically endless band of paper being covered with some sensitive preparation as it unrolls, then passing on to the exposure platform, and afterwards into developing and fixing baths. At the present time exposing a negative on a travelling band three thousand times in five minutes would not be bad work."

These lines were no sooner read by the inventor of the camera referred to than he saw the feasibility of the idea which the editor had thrown out, and the thing began to take shape in his mind. A few months later he had constructed a model which fully answered to his expectation, and the invention was patented (1891). About the same time (October 29, 1890), this model was exhibited in the Literary and Scientific Institution of Bath by the inventor, who also read a paper upon it, which, amongst other things, contained a forecast of the use to which the invention might be turned. Speaking of the effect the original idea had upon his mind, Mr. Greene said, "My blood was fired with enthusiasm, for I thought of taking a scene in Hyde Park or in the City, where the ceaseless stream of life is never ending, by the machine camera one day, and producing in the course of a few hours a paper which could be delivered to the public showing, true to nature, all the movements of life, or anything that might be of interest which was photographed at the time. . . . . A well-known person's photograph, with his letter, could be copied by photography and put in print much more quickly than you could set up the type for the letter, leave alone a block, which would take days for the likeness, and then not be so perfect as it would come out being printed by light alone, for you could not equal the texture and detail by the block process that you could obtain by the other."

When this forecast was made, the invention had not gone beyond the rough model stage. But by that model was produced a long band of photographs printed from half-plates, with gas as the illuminant, the exposure being almost instantaneous. The invention having gone so far, and been protected by patent, the matter was allowed to rest. Many persons saw the model, and one or two were convinced that there was in it the germ of a wonder-working machine—to be produced some day. It was not, however, until about a year ago that anything was done towards putting the invention to a thoroughly practical test. Then a friend of the inventor's, seeing what he called "the revolutionary character of the invention," undertook to obtain capital to give the thing a trial. He succeeded in January last in interesting Sir George Newnes in the matter, and through his enterprise the invention has been put to such a thorough and practical test that it has more than fulfilled expectation. In short, when it came to experimenting, and to different minds turning their thoughts to the same end, it was found to be possible to make great improvements in the machine, and to obtain the end aimed at in various ways; so much so, indeed, that it was found necessary to take out fresh patents.

As already said, the first experiments were made with the original model; but, as this allowed of the printing upon one side of the paper only, and from half-plate negatives, it was, at an early stage of the experiments, decided to construct a machine large enough to print eight pages of the *Strand Magazine*, namely, four on the one side of the paper and four on the other.

The machine, as will be seen from the illustration (fig. 1), consists of a box for the printing process, and a number of tanks or troughs to receive the developing, fixing, and finishing solutions. The box consists of two separated chambers for containing the negatives, the first chamber containing the negatives to be printed on the upper side of

Fig. 1.

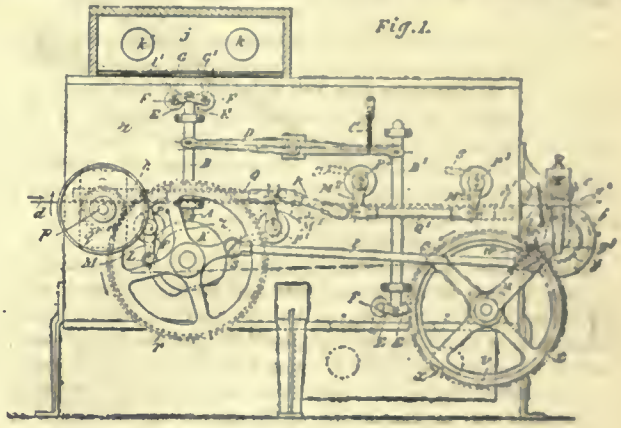
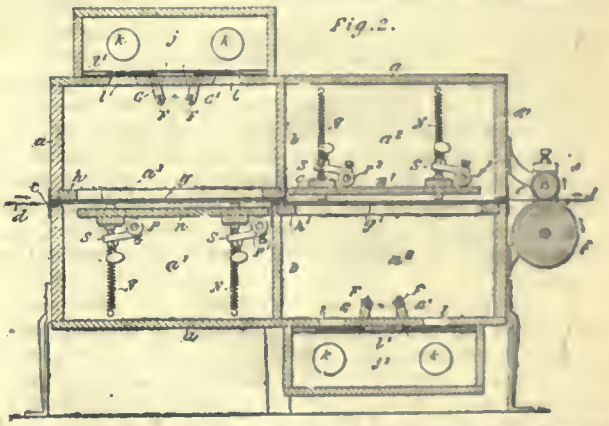


Fig. 2.



the paper, and the second chamber containing those to be impressed on the under side of the paper. Each chamber constitutes practically a dark room, with a sliding shutter to admit the light, the light being contained in a separate compartment called the light box, divided from the chamber proper by the shutter. The light is supplied by incandescent electric lamps, and may either be diffused or reflected from a mirror.

The negatives are firmly fixed in a frame, and the frames, fitted with grooves, are made to slide in and out for the purpose of

changing the negatives, &c. When in position, the negatives are in their respective dark chambers, that for printing the upper surface of the paper just above, and that for printing the under surface just below, the central line of the machine, along which the sensitised paper is carried. Immediately under the paper, in the first chamber, and immediately over it, in the second, is a platen, or pressing plate, faced with soft felt, which, when the exposure is made, presses the paper upon the under side of the negative.

The paper to be printed on is contained upon a roller, and is either already sensitised, or it may be sensitised on its way into the machine by passing through a trough charged with the necessary emulsion. It goes into the machine through a slot, and, as soon as it has filled the two chambers, by the action of the machine, the apertures in the light boxes open, while simultaneously the platens press the paper against the negatives, steadying it, and thus the exposure is made.

The instant the exposure is made, the respective apertures close, the pressure of the platens is removed, and the printed portion of the paper is carried forward, giving place to a fresh, unprinted portion. This intermittent motion of the machine proper, which is obtained by means of a pawl, is then repeated, and, with each forward movement of the paper, a portion of the sensitised surface is exposed to the light, first on the upper and then on the under side. As soon as the paper, thus printed upon, emerges from the printing box through a slot, the intermittent motion is converted into a continuous one, which is maintained uniformly while the paper is being carried successively, by means of glass rollers, through the tanks containing the developing, fixing, and clearing solutions, and so finally into an enclosed chamber or box filled with hot air or exhaust for drying.

From the description it will be understood that every section of the band of paper equivalent in length to an intermittent feed is first printed on the upper face and then on the lower face, and that, while one section is being printed from the negative in the first chamber, the next following section is being printed from the negative in the second chamber. When it is desired to print on only one side of the sensitised paper, one or other of the chambers is not supplied with a negative, and, of course, the electric lamps of the respective light box are shut off.

An important consideration connected with the working of the machine is that both the exposure and the development are being carried on at the same time, so that the operator who is controlling the machine is able to see at a glance if the picture or printing is not coming out as it should do. If there is over-exposure, he can easily, by an electrical resistance register, adjust the light to the negative. In the same way he can modify or strengthen the developer to the needs of the case.

A smaller machine, for purely photographic purposes, is made single for printing upon one side of the sensitised paper only. These can be adapted for use either with an incandescent lamp or with an ordinary oil lamp. When the latter is employed, there is no difficulty in adjusting the light to the quality of the negative.

The negatives employed may be either negatives produced directly by photography, or they may be photographs of pages of letterpress printing; or a negative may be used in which the two are combined —an ordinary photograph, presenting a view or a person, to which a letterpress description has been added, or other combination may be made.

In order to make his machine effective in a commercial sense, Mr. Greene had many chemical difficulties to contend with. For instance, it was necessary to find a cheap and efficient sensitising salt. Equally necessary was it to discover a developer which would be at once reasonable in price and speedy in action, giving a clear picture in a fraction of a second of time. Both these desiderata have been obtained, as well as a clearing solution equally effective with the others. Thus far, by these means, it is possible to make from two to three thousand exposures per hour, and to bring up the other processes to that average of working; while, with a later development of the machine, which need not be explained here further than to say that the intermittent up-and-down motion is replaced by a cylindrical arc (similar to that of the rotary printing machine), a much higher rate of speed can be obtained

It will be seen that the new photographic printing machine is very simple in construction, and it is believed that by it the cost of printing will be greatly reduced, as well as the quality of it greatly improved, especially as regards the printing of illustrated books, newspapers, &c. There are no complicated movements requiring expensive and heavy machinery; and, indeed, so little friction is there that the machine is almost noiseless. Briefly stated, the construction and operation of the machine is based upon the proper timing relatively to each other of the intermittent movement of the rollers that feed the sensitised roll of paper, the opening and closing of the time shutters, and the up-and-down movement of the pressing and steadying plates. The action is that by a couple of rollers the paper is first given an intermittent feed; then, while the paper is stationary, the platens or plates move against it and steady it, and then the time shutters open; after which the shutters close, the steadying plates recede, and the feed rollers give another feed, and so on. Simultaneously with these movements the paper already printed upon is going steadily and by a uniformly continuous motion through the developing, fixing, and clearing baths into the drying chamber.

Nor is the above the full extent of Mr. Greene's invention for the superseding of ordinary printing. By means of another machine, almost more surprising than that for printing, he is enabled entirely to do away with movable types. But to describe this machine another article will be necessary. ALFRED T. STORY.

THE PHOTOGRAPHIC OPINIONS OF ULYSSES McGILP.

THE EMERSONIAN CULT.

SOME of the possibilities of artistic expression, which are latent in every camera have once more been strongly emphasised by an assortment of *Marsh Leaves* which Mr. Emerson has, with all his wonted fastidiousness, gathered in the East Anglian lowlands, and issued in the form of a book of short essays—which are, by the way, very readable, being curious, and pathetic, and a good deal more—illustrated by sixteen photo-etchings. These last form so telling an indictment against the prevailing amateur photography, that it is worth while spending a few moments in, firstly, considering the much-vexed question as to the connexion between photographs and other monochromes; and, secondly, whether Dr. Emerson gets any nearer to the frontier line between Pencilvania and Camerania than does any other photographer.

THE EMBELLISHMENT OF NATURE.

Of course Pencilvania is a province of the brilliant empire of *Pictorial Fine Art*. Here let me add to the myriad definitions of the last term by describing it as the embellishment of Nature. Decoratively considered, art should embellish that to which it is applied; pictorially regarded, it should embellish that which it depicts.

It is in the twofold sense included in the above definition that I would compare the photography of Dr. Emerson with that of some of his more redoubtable rivals.

In doing this it is to be remembered that photography, being distinctly a tone-rendering process, and nature being all tonality and no line, the genius of a good and a true photograph must needs be most perfectly embodied where the effect is attained of melting modulations and delightful mezzo tints.

FRETFUL PHOTOGRAPHY.

But, in looking over many a photograph by those who are regarded as trusty leaders, one cannot but be struck by the frequent recurrence of prints which are at first sight more in consonance with line work than with wash. Some may be inclined to ask, Why should not this be praiseworthy? For answer, it is enough that only a real bad photograph can possibly have anything in common with a line drawing; and, moreover, the bad photograph, where it imitates the line drawing, only does so by reproducing the most unlovely and immaterial qualities of the latter. The artist with pen or burin uses his instrument to suggest forms by means of conventional lines—often outlines—which the necessities of his materials impose. These a person of suitable art culture readily—and in a measure un-

consciously—transforms into what they stand for; such a one is not attracted by the multiplicity, nor by the fretfulness, of the lines, but by what they convey, and by the dexterity of their expression. But the objects in a photograph are without definite outline; instead of which a bad photograph often presents us with a stupendous mass of niggle and trashy detail which in a degree sometimes simulates the characteristics of stipple, while at other times we get much of the ill effect which accompanies degraded line work.

Framed in Gaudy Gold.

Recall some of the photographs by some of the leaders—for instance some of those who are often chosen to sit in judgment over their fellows—and you cannot fail to notice that these exhibit a wiry, disenchanting, presentment of nature which makes one more than ever sure that it is not the common herd of art illiterates—the people who don't know their picture alphabet—who are fit to elect the dispensers of art merit. Most of us know of what the *vox populi* is capable, of which there is not a more telling example than was afforded some two or three years ago when, at a "people's" Exhibition in London, at which it was sought to awaken a critical faculty, each artisan was furnished with a voting paper on which to record his opinion as to the best picture. In the event a thumping majority voted for the vilest painting in the gallery; but *it had the largest and gaudiest gold frame.*

Take the Judges out of their gold frames, remove their mounts, wipe out their names, and then let the crowd elect afresh; how many of the present stock company would be left in? How much worse would the new lot be?

Routed by the Doctor.

What the Judges do in photographic print they in great measure approve and encourage in other people's works; hence the perpetuation of photographic misapplications. Of course the "dot and dash" school of photographers is ever so much less assertive than formerly; for Dr. Emerson, years ago, routed a whole army of these rabble art traducers. Some of them, however, still have a sneaking regard for their old bad ways; even where they have grasped the value of breadth of treatment, they have in the main most grotesquely and woefully misapplied this estimable quality.

All having art training and experience know that one cannot, when buying a camera, at the same time by an addition to the purchase money of say ten per cent.—surely not too much?—buy art capacity. Some of the very clever ones soon found this out; and so they remedied it my fitful reading mainly of the water-oum-art order of books, and by desultory, but very precious talk with other callow gropers; and so, although they have, to be sure, never arrived at the position of artist—not even in the latent sense of the word—they have picked up enough to hide their deficiencies, and to impose upon others who are just a weeny bit more ignorant or a vast deal more modest.

The Big Gun and the Throstle.

These half-artists, however, are often able to show us photographs which to a certain extent are really imposing and pleasure-giving, the explanation of which is somewhat as follows: Nature is not always obviously charming, and is but seldom dramatic and brilliantly splendid. When such rare moments arrive it takes no great artist to appreciate them, for they speak loud-mouthed, even to the most commonplace individual. The booming of a big gun is noted by more than is the song of the throstle. Take a sunset as pictured in *The old Téméraire*; if such were met with in nature, it would probably attract every camera man in the kingdom, and fairly and well photographed, could not fail to compel admiration. Such ready made pictures, which nature from time to time puts before us, have only to be copied with industry and with a mere pinch of the salt of art. Hence it is that we find so many inflated reputations. Amateurs are praised for the glory which the natural kaleidoscope periodically provides.

Loathsome Middle-class Art.

The proper criterion would be to take the weakest links—or even the average ones—in the chain of photographs by which the amateur seeks to climb; such a test would, I fear, much more than decimate the front rank; which is not matter for surprise, for it is to be remembered that the best of them—so they themselves declare—are painters who have failed—*i.e.*, men who, having laboured to make their way with palette and pencil, have found themselves lacking in art, and have hence taken refuge in photography. This class is closely run by those who, having natural gifts, fail for want of early and sustained training. Over and above the foregoing are a very few who can boast of enough of both aptitude and training to just raise them beyond that abomination of mediocrity, the loathsome middle-class art, with which all England is at present overwhelmed.

These last are the individuals who may best benefit by the latest of Dr. Emerson's photographic manifestoes, and I hope to point out in a future article what lessons of profit there are for them in *Marsh Leaves*.

BROMIDE PAPER FOR NEGATIVE WORK.

In view of the letter in our last issue (p. 14) on this subject, it is interesting to note that Herr Watzek lately gave an interesting lecturette on this subject before the Camera Club in Vienna, and in the current issue of the *Wiener Photographische Blätter*, the organ of the Club, is an article by Dr. Henneberg, whose extremely artistic pictures at the Salon attracted considerable notice, on the same subject. Dr. Henneberg used Eastman's extra rapid bromide paper up to 15 × 12, and he points out that it possesses all the advantages of celluloid films, viz., lightness, non-fragility, absence of halation, and the power of printing from both sides of the paper, with a further advantage that it can be obtained without trouble in any desired breadth in rolls of about seven and a half yards; and, further, it does not curl and roll like celluloid films, and how easy it is to retouch and fake with pencil or brush, and how much cheaper than plates or films.

The grain, which might be an objection in small sizes, is not noticeable in the larger, as usually these are printed on rough papers.

With regard to the practical work, development is carried out as usual, and it is not necessary to use either an acid fixing bath or a clearing solution. It can be intensified without trouble with uranium, and for reduction the well-known hypo and ferridcyanide can be used, but great care is required, as the solution acts at the back as well as the front of the image, penetrating as it does through the paper.

To render the paper transparent, Henneberg suggests the use of vaseline oil applied with a broad brush to the paper only. He states that negatives thus treated print as quickly as glass negatives, and they are best kept between stearine paper under pressure.

FOREIGN NEWS AND NOTES.

Photography in War.—The Japanese, as is probably well known, utilised photography to a considerable extent in the late war with China, and they are now about to dispatch some of their official photographers to Europe to inspect the system of photography in connexion with the war departments of European countries. They have also decided to send a photographic survey department to Formosa, to collect reliable data as to the topographical features of the island, the habits of its people, &c.

Chlorides in the Developer.—According to L. Tranchant the soluble bromides, which have hitherto been so much used for restrainers, can be replaced with advantage by some chlorides and organic acids or their salts, because the bromides dissolve the silver bromide and thus give rise to defective negatives, as the most delicate details may be attacked. He states that the chlorides of sodium, potassium, ammonium, and zinc restrain without dissolving the silver salt, as do also sodium acetate, acetic and malic acids; cupric chloride acts as a slight solvent. Arrayed in the order of their restraining powers, the salts are cupric, zinc, sodium, and ammonium chlorides, acetic and malic acids. A 1 per cent. solution of cupric chloride, a 5 per cent. solution of zinc chloride, as well as 25 per cent solution of sodium and ammonium chlorides, are equal in power to a

20 per cent. solution of potassium bromide, 10 per cent. solution of acetic and malic acid, on the other hand, only equal 1 per cent. of potassium bromide. To use zinc chloride, sufficient sodium carbonate must be added to cause a distinct precipitate of zinc carbonate, and he finally concludes his note by recommending ordinary salt or ammonium chloride. It is obvious that these statements apply only to gelatino-bromide plates, as chloride of silver is readily soluble in most chlorides, even to as high a percentage as ·58 in calcium chloride, as pointed out by Hahn.

Photographic Perspective.—Professor Schiffner points out that the smallest angle under which an object is visible is generally assumed to be one inch; when viewed at the distance of normal vision, about ten inches. According to Mertens, the angle at which an object is distinctly seen is about 27°. The angle of the eye to see an object clearly is 45°, the mean is 36°, and a picture is generally viewed at a distance equal to one and a half to twice the longer base of the picture, so that the generally accepted focus of a lens as one and a half times the longer base of the plate is correct. With these data, b, it is possible to reckon out, with any given object, distance g, the focus, f, of any lens which will answer to these requirements, by the formula $f=\frac{gb}{g+f}$; or, for a lens of known focus, the correct distance of object $g=\frac{bf}{b-f}$. He also points out the importance of the correct position of the point of sight, which should be below the horizontal middle line, as it is far easier to look up than down. Objects which should appear natural should appear for the greater part above the horizontal line of sight. The horizon should be about one-third below the middle line of the picture.

Anaglyphs Perfected.—M. Louis Ducos du Hauron, the original inventor of the anaglyph, describes in the *Revue Suisse* how he has still further perfected it, so that it gives not only the idea of solidity, but also "une sensation de polychromie complète des plus agréables." This is a distinct advance to obtain colours and relief, and it is attained in two different ways: either by the use of two stereoscopic negatives, or by using three negatives, two of the latter not being taken stereoscopically, and printed one over the other, whilst the third fulfils the usual requirements of stereoscopic work. By the first method, the negative for the right eye is taken through a green screen, and printed in red, madder lake; the negative for the left eye being taken through a red-orange screen, and is printed in Prussian blue, the prints being viewed through spectacles with turquoise blue and ruby red glasses; this is said to give all the colours. The second method is more complicated, and is founded on the ordinary three-colour process, the two prints, negatives from which are superimposed accurately, are taken with blue-violet and green screens, and printed with chrome yellow and madder lake, the third negative being taken through an orange-red screen, and printed in Prussian blue. The same coloured spectacles are used as for the first method. This method has also been adapted to lantern projection.

ON A SIMPLE METHOD OF PROJECTING STEREOSCOPIC PICTURES ON THE SCREEN BY MEANS OF TWO ORDINARY LANTERNS.

[London and Provincial Photographic Association.]

I THINK we can fairly claim that my system of getting a stereoscopic effect on the screen has not been shown to an audience before in this country. When we first saw the anaglyphs, the invention of Mr. Ducos du Hauron, we thought that something of the sort might be applied to the lantern, so set to work for that end. I tried a great many different ways, dyed my films in all sorts of colours, red, blue, yellow, used all the various coloured gelatines that I could get, had heaps of carbon tissue made in various ways to try and get the right colours, but with poor success, as you will see. The great difficulty was to get the proper colour value in the different pigments that we used, and in the spectacles through which it is necessary to look at the picture. If these pictures could be produced in their proper colours in this way, they would have a much better effect than can be got with a black-and-white picture coloured by means of coloured glasses. Gelatines are of no use, you cannot get them of the proper colour value; and, if you could, they will not stand the heat of the lantern, for in a few seconds they blister up and burn, so I had to fall back on the coloured glass. And, to show this system of stereoscopic projection, as I have said, it is necessary to have two lanterns, either a pair side by side or a biunial. In the one lantern you place one half of a stereoscopic picture, and in the other lantern the other half; and behind one picture you place a red glass and behind the other picture a green glass. Now, when these two pictures are projected together on the screen, they are made to cover one another, so that we see an indistinct mass of colour caused by the two slides occupying the same place on the screen. If the coloured glasses are of the right colour value, and we cover up the green glass in the left eye, we shall see only one picture, and that all red, though there are still two pictures on the screen; now cover up the red glass in the right eye and look through the green glass of the left eye and we shall see only one picture, and that will be green, though the red one is still there; now look at the picture through both eyes of the coloured spectacles, with a red glass in the right eye and a green glass in the left eye, and we shall see that the two pictures that have been projected by the two lanterns on to the screen are made to blend, not only into one another, but to stand out in bold stereoscopic relief.

Let us consider for a moment the cause of this. We have two pictures of the same subject taken with a pair of lenses separated at two or more inches apart, so that one lens takes one picture at one angle, and the other lens at another angle; now, if we look at the picture so taken through an ordinary stereoscope with prisms, we get one impression, and so see the object photographed as we do in nature; just the same with the system that I shall presently show you. If you understand the principle on which this new stereoscopic projection is shown, you will more easily grasp the cause of the effect. As I have said before, we have two similar pictures of the same subject, one taken to the left and the other to the right, these two pictures being covered with coloured glasses, one red, the other green—and we want to see each separately. In nature we see more to the left with the left eye, and more to the right with the right eye—we want to see these two pictures as one. To do this, we look at the left picture through a glass of the same colour as it is covered by, and the right picture by a coloured glass the same colour as it is covered by. So we get two pictures conveyed to the eyes separately, at the same time, with the result as in nature, everything standing out in bold relief; so much so, that, in the special stereoscopic pictures that I have prepared to show you this evening, the plants and other things stand out in such bold relief that one feels as if you could put your hand through the leaves and pick the flowers. To get the best effect the subject should be large, that is to say, when shown on the screen, as near life size as possible. I will show you some interiors—they are so real that you feel as if you must get up and walk down the long corridor and sit on one of the seats; I will show you a party of travellers crossing a glacier with their ladders and ropes—you will see how real it is. In looking at this picture in the flat, you get no idea of the difficult task these men have in hand. I have also two or three copies from an old set of diagrams, published many years ago, for showing objects in true perspective with stereoscopic effect, notably the one of a cross; if you look at it from one side of the room, you will see the front bar appear as if it stood right out and you could take hold of it with the hand; walk across to the other side of the room, and the bar will appear to follow you. This is very curious. Another example: a figure of myself, seated in a chair. If this is viewed at an angle, you seem as if you can see almost round the figure. The adaptation of this system has been brought within reach of any exhibitor by Messrs. Newton & Co., of Fleet-street, and put upon the market at such a price that I hope we shall soon see it introduced into every public lecture and entertainment. A few pairs of pictures thrown on the screen will give a far better idea of a place than all the description possible, so I will not occupy any more of your time, but at once proceed with the exhibition.

T. E. FRESHWATER, F.R.P.S.

A NEGLECTED METHOD OF RETOUCHING.

THE higher the artistic pretensions, says J. Gasdicke, in the *Photographisches Wochenblatt*, with which we may endeavour to invest a photograph, the more difficult will it be found to justify the almost universal practice of retouching by means of dots and short strokes. At the present time a freer and broader treatment of the picture is required. Laborious working up easily ends in a tortured expres-

tion, and, as the methods of retouching now followed are excessively laborious, the results often have a tortured, stiff, and dull effect.

Photography depicts in even tones that blend with each other in the most delicate manner, and it is therefore natural that retouching should also be done in even, soft tones. In place of this, strokes and dots are used, which are crowded together in enormous quantity to present to the naked eye the appearance of even tones. This may be approximately attained in albumenised prints, but not in collodio-chloride.

It is patent that the general effect may be lost sight of in this way, because attention is concentrated upon very small areas. The loss of time, too, in brightening up large surfaces very often leads to sins of omission, and the possibilities of a better interpretation are lost.

In contrast with this, we would recommend a more general use of the stump in conjunction with powdered graphite or finely scraped lead pencil.

A paper stump is preferable to one of leather, and may be bought of any dealer in artists' materials, or they may be made of unsized paper cut in long strips and rolled up to the thickness of a lead pencil. The last layer of paper must be fastened down with fish glue or gum to prevent the stump unrolling itself. Both ends of the roll of paper are then sharpened with a penknife, which may be repeated as often as the point becomes too blunt. A broad as well as a sharp point should be prepared.

The stump is now dipped into the graphite, and rubbed upon a sheet of paper until it is equally distributed over the point. The most delicate tones and the softest of lines can then be produced in perfect harmony with the tones of the negative. Portions of the picture that are too sharp may be moderated and made subordinate. Large areas may be brightened up in the quickest manner.

A still larger number of effects may be attained if the back of the negative is taken advantage of. To this end it is coated with a matt varnish, and the heaviest of shading can be rubbed on. By such means portions of the picture may be blocked out altogether, if occasion requires.

In retouching the film side of the negative, it is best to roughen the surface of the varnish by rubbing, or to use a retouching medium if heavy shading is required.

The stump will be found sufficient for most of the retouching, and only for very fine work will it be necessary to use the pencil Under any circumstances, the stump will effect a great saving of time, and, as more attention can be given to the general effect, the stump should not be absent from any retoucher's desk.

PHOTOGRAPHIC MOUNTANTS.*

[American Journal of Photography.]

Plain starch paste is the oldest and most universally used paste for mounting albumen prints. It still remains the most simple and cheapest medium for the purpose, and is certainly the least injurious, provided the precaution is observed always to use the paste fresh, never after it commences to become sour.

A different condition, however, exists where the prints are made upon the modern emulsion papers. Where the paper support of these emulsions is not too heavy, they show little or no tendency to curl, and may be mounted wet in the usual manner, a small percentage of glue being added to the paste, care being taken that there is absolutely no acid reaction.

Heavy papers that have a natural tendency to curl, or Aristotypes with a high gloss, require to be mounted dry, and require a different paste. A mountant is here required having a greater degree of adhesiveness; at the same time it must not penetrate the paper, or it would destroy the high gloss of the print.

To overcome this difficulty has resulted in the publication of many widely different formulas for mountants in the various photographic periodicals, and in every case it is claimed a perfect mountant has now been discovered.

Upon the other hand, manufacturers and dealers have put proprietary mountants on the market, and sold them to unsuspecting amateurs at exorbitant prices, although they by no means fulfil the requirements for a photographic mountant.

These requirements are as follows: In the first instance, the mountant should have a greater binding power than ordinary paste.

*Translated from the German and amplified by Julius F. Sachse.

It must show a neutral reaction, or nearly so, and in no case should it show a marked alkaline or acid reaction. Further, it must not contain any substance which will prove injurious to the photographic image, such as the mercurial salts so frequently added to commercial mountants as an antiseptic or preservative.

A useful, safe, and practical mountant must be cheap and easy to manipulate, and be slow to decompose or spoil. For glacé or matt Aristo papers it is requisite that the paste shall not penetrate through the paper, else the enamelled face of the print, be it glacé or matt, would suffer.

In the photo-chemical laboratory of the K. und K. Lehr von Versuchs Anstalt for photography and reproduction processes at Vienna, a large number of formulas and mountants have been tested, with special reference to their composition and fitness for photographic purposes. The deductions from these experiments show the following results:—

Starch Mountants.

If starch is treated with aqueous alkali under certain conditions, it swells and forms a semi-transparent, viscid mass, having strong adhesive properties. This product is variously known in commerce as vegetable glue, glutine, triticine, collodin, &c. Most all of these preparations show a strong alkali reaction, and upon this account are useless for photographic purposes, notwithstanding their great relative adhesive properties.

In cases where the product is neutralised with acid, it proved at the expense of the adhesive properties. Consequently, on account of this effect, all advantages of these vegetable glues over ordinary starch paste are lost when the former is in a neutral condition.

Far superior, for photographic purposes, are mountants composed of starch in combination with the gum arabic or dextrine. These mountants have the advantage over all gelatine mountants that they are viscid or pulpy at an ordinary temperature, and at the same time possess a relatively strong adhesiveness.

An excellent mountant of this nature is made as follows, and which answers for mounting ordinary photographs, such as albumen, Aristo, platinotype, and celloidin prints, as well as glacé or matt Aristo prints, in all their variety, as it has the advantage of not penetrating through the paper.

White gum arabic	35 grammes.
Water	100 c. c.

After the gum is dissolved strain through a piece of muslin to remove any possible foreign substance, then add

Starch	30 grammes.

Stir this in a mortar or suitable dish, and heat the whole mass over a water bath until the paste has reached the required consistency.

The addition of a little white sugar has proven of advantage.

The substitution of dextrine for gum arabic, somewhat lessens the adhesive properties of the mixture.

Compounds of dextrine, alum, sugar, water and carbolic acid (as an antiseptic) have also proven of service and value in these experimental tests.

A good formula is as follows:—

Dextrine	60–90 parts.
Alum	4 ,,
Sugar	15 ,,
Water	120 ,,
Carbolic acid, 10 per cent.	6 ,,

Mixtures of Starch Paste and Dextrine

in various forms have of late been brought into commerce and sold for photographic purposes. One of the most widely advertised pastes of this class is one labelled "Concentrated White Paste." This paste represents a viscid white mass, which, according to careful analysation, consists of water, starch paste, dextrine, boracic acid, glycerine, and a small portion of thymol as an antiseptic.

Gelatine or Glue Mountants

are absolutely unfit for mounting photographs. As the gelatinous mass has to be liquefied by heat for use, it readily decomposes, and, if diluted to a proper consistency, has the fault of penetrating through the paper.

The simplest method to overcome the latter drawback, and at the same prevent rapid decomposition, consists in adding to the liquid glue a small quantity of amyl-alcohol (fusel oil).

Liesegang recommends as mountant for his glacé Aristo prints a paste made from good glue (Cologne glue, free from acid) to be first swelled in water, the surplus water to be poured off, to which is to be added, under constant stirring, one c. c. of amyl-alcohol for every 30 c. c. of the dis-

solved glue. This mountant can be diluted with water. It sticks well, but must be used warm. The disadvantage in its use is the strong smell of fusel oil that it imparts to the print.

COMPOUNDS OF GLUE AND STARCH PASTE,

to which a greater or less quantity of turpentine is added, possess strong adhesive properties, and have frequently been recommended for photographic purposes.

An excellent mountant of this class can be made as follows: 40 grammes of good (Cologne) glue is soaked in 100 c. c. water and melted over a water bath. When from 80 to 100 C., 40 to 50 c. c. of dissolved starch is added, the mixture being constantly stirred. When these have united and formed a homogeneous glutinous mass, 10 c. c. of turpentine is added gradually until the whole mass forms a thick, brownish, sticky liquid.

This mountant, unfortunately, must also be applied warm. The addition of the turpentine, as proven by many experiments, in no manner affects Aristo prints.

Good results, with extraordinary adhesiveness, were obtained according to the process patented in Germany by E. Wiese, of Hamburg. This consists in a liquefaction of gelatine or glue by means of chloral hydrate (D. R. P., No. 77,103).

When gelatine or Cologne glue (a bright-coloured, very adhesive glue) is steeped in water and then melted, and a certain quantity of chloral hydrate added, an adhesive paste results of great strength, which has the property of remaining liquid, and, as proven by experience, is well calculated for photographic purposes.

A good formula for preparing a mountant of this class is as follows:—

Gelatine or Cologne glue	40 grammes.
Water	120 c. c.

The glue is to be steeped in the water, and then dissolved over a water bath.

Chloral hydrate	20 grammes

is then added, and the whole mass heated for some time. This results in a clear, sticky fluid, which can be neutralised with a few drops of a soda solution.

This mountant has the advantage that, with its great adhesiveness, it does not go through the paper.

Above mountants, continues Herr Valenta, are only to be recommended in cases where starch paste fails to fill the requirements; for instance, with Aristos having a glacé or matt surface, &c.

As all the above recipes have been carefully tested in actual practice, they may be relied upon without hesitation in all cases where their use is desirable or necessary. PROFESSOR E. VALENTA.

"PHOTOGRAPHY" UP TO DATE.

THE Vienna correspondent of the *Daily Chronicle* says:—"A sensational discovery, which, if the reports are confirmed, is likely to be attended by important consequences for physical and medical science, is spoken of in scientific circles here. A new conductor of light has been discovered by Professor Routgen, the well-known physicist at the Würzburg University. So far his experiments have resulted in the discovery that light penetrates wood and the flesh of men and animals, without, however, penetrating bones and metals. The professor succeeded in photographing metal weights placed in a shut-up wooden case. The photograph sent to Vienna shows only the weights, but nothing of the case. Another photograph of a man's hand shows only the bones, while the flesh remains invisible. Professor Routgen's experiments are conducted in the following way: He takes a so-called Crooke's pipe—viz., a well pumped-out glass pipe, with an induction current going through it, and by means of the rays which that pipe is emitting he photographs on ordinary photograph plates. In contrast with the ordinary rays of light those rays penetrate wooden and organic matter and other opaque substances, just in the same way as the ordinary rays of light penetrate glass. Experiments were also made in photographing hidden metals with the apparatus shut, and produced equal success. The rays penetrated not only the wooden case containing the metals, but also the cover placed before the plate of the apparatus. The scientific world here is much agitated by the discovery, which it is believed will be of far-reaching importance for many branches of knowledge. Already in its present stage it will be an excellent expedient for surgeons, particularly in cases of complicated fractures of limbs, in searching for the bullets of the wounded, &c. The photograph will show not only an exact picture of a fracture, or the situation of a bullet, but spare the patient much painful manual probing with the sound."

Our contemporary thus comments on the Professor's "discovery":—"'Spook' photographs may take a back seat; everything must be conceded to be now possible to the camera, if we are to credit all that we hear from Vienna. Our correspondent in that capital tells us to-day of a discovery by Professor Routgen, of Würzburg, that lovely old city on the Main, whose university celebrated its tercentenary fourteen years ago, whose cathedral goes back to the twelfth century, and whose inhabitants show to this day the strain of much Roman blood. This gentleman does more than 'look you through and through'—he gets a likeness of your very skeleton. Flesh and blood are no barrier to the lens of his camera. He can picture instead of probe for a bullet that has entered, and show on a glass plate the mischief it has done to the bony structure. That is a good deal to do, we cannot help thinking. But this is only as the beginning of the newest wonder of the world. He can photograph metals even when they are covered with wood. A tin soldier, for example, with a bucket inverted over it, might come out on the plate as a real live Pomeranian Grenadier or Coldstream Guardsman, and Kaiser Wilhelm himself might be mistaken for an effigy of brass. But the wondrous camera of Würzberg will do more than this, it will do these surprising things even when a cover is put over the lens. Many years ago Asmodeus, the devil on two sticks, was represented as taking the roofs off houses to see what was going on inside. Presumably this process will no longer be needed in the case of houses furnished with Venetian blinds, provided those inside have only some metals about them such as watch chains or brooches. Fearful possibilities lie that way. But seriously we shall all have to begin to mind our p's and q's if this development of photography goes much further. 'Stone walls do not a prison make,' as the poet observes, but, if the camera can already see through wood, why not in time through a brick and a half? We shall hope to find some of these extraordinary negatives in London soon, for 'seeing is believing,' as the proverb hath it."

AN IMPORTANT CASE.—ILLINGWORTH *VERSUS* DRAYCOTT.

THIS case was tried at the Birmingham Winter Assizes, before Mr. Justice Cave; Mr. Hugo Young and Mr. Pritchett appeared for the plaintiff, and Mr. Jelf and Mr Disturnal for the defendant.

Mr. Hugo Young, in opening the case, stated that it was an action brought by William Illingworth, photographic operator, against John Arthur Draycott, carrying on business at Birmingham, Northampton, and Walsall, for damages for wrongful dismissal. The plaintiff, having entered the service of defendant in 1891, managed the Northampton business at a salary of 4*l.* 4*s.* per week, until 1894, when plaintiff, well knowing his ability, proposed that he should assume the management of the Birmingham establishment for a period of four and a half years, at a salary of 5*l.* 5*s.* the first year, 5*l.* 15*s* 6*d.* the second year, and 6*l.* 6*s.* thence until the expiration of the term, plaintiff not to practise within eight miles of either of defendant's establishments for five years after the termination of the agreement, this agreement dating from October 1894. After about three weeks' service at Birmingham, defendant frequently complained, and eventually, under a clause in the agreement, gave plaintiff one month's notice. This action, counsel complained, was not justifiable, and it remained for the jury to assess the amount of damages they would award the plaintiff. In assessing the amount, it might be pointed out that they, the jury, had to estimate the probable amount that plaintiff might earn. The photographic business was at present in a very depressed state, and, since Mr. Draycott had dismissed plaintiff, the latter had only been able to secure a four weeks' engagement at 2*l.* 12*s.* 6*d.* per week, and nine weeks' employment at 4*l.* 4*s.* per week; this, deducted from the salary that plaintiff was entitled to under the agreement, for a like period, showed a deficit of about 56*l.*, and at this rate the total loss that plaintiff might suffer, roughly and moderately speaking, would amount to about 500*l.*

William Illingworth, the plaintiff, entered the box, and admitted a clause under which he might be dismissed, for non-observance of agreement, gross mismanagement or neglect, insobriety, want of skill, or misconduct.

Mr. Jelf (for the defence) submitted that, to be a successful photographer, one must be a man of many parts; not only must he understand the technical details, but must humour and please the customers, treat them tenderly, gently, and respectfully, and in his conduct of the business, exercise such care and control that nothing should be sent out which could occasion harm to his master's business. These were, no doubt, high attributes to expect in one person, but it was on account of these high expectations that the defendant was agreeable to pay the handsome salary he was prepared to pay. It was not disputed that plaintiff had ability, but he must, under the agreement, exercise it; that it was his duty to humour the customers, and in every way satisfy them; that he should call witnesses to show that plaintiff had offended in many ways Mr. Draycott's customers; that it was his duty to supervise the forwarding of all prints; that many had been sent out that would bring discredit upon the establishment; that some of nude infants were of such a character that they might be deemed indecent, and had given great offence to parents of the children; that there were incidents where the plaintiff had shown want of skill and spoiled negatives; that such proceedings were calculated to bring discredit upon a high-class business, and rendered it imperative that Mr. Draycott must at any cost dismiss

plaintiff before his business had suffered further loss, and he submitted that, as business men, he had no doubt that the jury would unhesitatingly support Mr. Draycott in the course he had taken.

Counsel proceeded to cross-examine plaintiff, and submitted several examples of work. With regard to the photographs of nude children, he admitted they were not high class, but submitted that, under the circumstances, they were as good as could be obtained. His instructions from Mr. Draycott were, when any customer came, under any circumstances, Get their money and make an exposure, and, if not satisfactory, they can sit again. This led to some of the failures shown. With regard to the nude infants, which had been termed indecent, he did not agree with that term, but would not say he considered them decent; but he was not wholly responsible for them, as the mothers desired nude photographs; but he would not swear that the mothers wished that particular attitude. With regard to the group of cricketers, he considered it good under the circumstances, but, apart from that, not high class. The group standing in the sun caused them to close their eyes, and many had dark shadows from their hats, &c. He did not take it in front of the pavilion, because a streak of light shone brightly upon one part of what would have been the background. With regard to the Bentley group of four young ladies, he was aware one was about to go abroad, and it was very desirable to secure a good negative. He made three exposures, and, as it was late, he left them in the washing water from Saturday until Monday, under a low glass roof, in hot weather. On Monday they had greatly increased in density; he attempted to reduce with red prussiate of potash and hypo, and, being unsuccessful, used chloride of lime. This destroyed two negatives, but the third was all right when taken from the washing water on Monday night, but, on the following morning, the film was broken up and spoiled. He had made 800 exposures, and of these 153 had resat once and twenty-five had resat a third time. Was not aware of complaints, or of letters of complaint—except one, which he answered.

The portrait of Mr. and Mrs. Edmunds was not good, or what he cared for, but they brought an American photograph and wanted theirs to match. Re-examined by Mr. Pritchett: Would find it very difficult to obtain a situation without a character; did not personally send out the alleged indecent prints. It is not at all unusual to have resits or complaints. He did his best, and had treated scores of negatives as he treated the Bentley group, but never before had any mishap.

His Honour here interposed that the witness might be asked questions as to damages, but from the nature of the defence the onus of proof rested with that side, and Mr. Hugo Young said that he had no witnesses to call; and that closed his case.

Mr. Draycott entered the box, admitted the agreement, but had to complain so many times, and found such injury to his business likely to arise from plaintiff's want of tact and skill, that he felt compelled to dismiss him; he paid a high salary to ensure efficiency; he only sold one of the cricket groups, they were so bad, whereas he had originally thirty ordered at 4*s.* 6*d.* each. With regard to the nude infants, he considered they were filthy, and calculated to do him infinite harm, as one customer mentions it to others and the matter spreads. He repudiated the idea that he had in any way passed the photographs complained of, and, after the receipt of thirty-five letters of complaint, felt that he must put in force the clause of the agreement and dismiss plaintiff, but it was in no way to save his pocket.

Cross-examined by Mr. Young: He had had five operators in about five years, as he could not secure all the feature he desired.

Miss Liechti, of the reception-room, had showed the letters of complaint to plaintiff.

Mrs. Brewer did not desire her child nude, in fact, bought a shirt on purpose to cover it. Plaintiff suggested taking the shirt off. She did not get what she wanted, and was annoyed at what was sent. Mr. Draycott eventually took it satisfactorily.

Dr. Arkwright took his baby to be photographed; he wanted the child sitting up, plaintiff took it in a chair. He had nothing to complain of his manner, but the photograph was not satisfactory.

Mrs. Terry had her portrait taken, but, as her husband did not consider it satisfactory, she returned it, and complained, and she thought the plaintiff was unduly "sharp" with her, and gave her the idea she ought not to have complained.

Mr. Chapman, who took his daughter to have a portrait taken, complained that plaintiff capered about, and got up to such antics that he frightened the child. He was there nearly an hour, and told the plaintiff that, if he could not do it, he would go elsewhere.

Mr. E. C. Middleton, called as an expert, condemned leaving the plates in water from Saturday until Monday night, and considered it risky; in fact, in view of the value of negatives of the Bentley group, grossly negligent; could not understand any great increase in the density of the negatives left in washing water, and believed red prussiate of potash and hypo an entirely satisfactory reducer in skilled hands, and would not have used chloride of lime, on account of its great action on the gelatine film. He would never take a group in strong sunlight unless there were other considerations more serious.

Mr. Thomas Fall, of Baker-street, London, strongly condemned the prints of babies submitted and some others; they were beneath criticism from an art point of view. Admitted of some prints that he had seen worse. The cricketing group he would have refused to take rather than run the risk of producing the effect plaintiff had. In the case of the Bentley group, knowing the importance of the matter, he would, to ensure a good result, expose six plates. The treatment of the negatives he condemned; had never heard of the use of chloride of lime, and would never need to use it. On the question as to how many resits would be a fair percentage out of 800, the witness declined to commit himself to any definite opinion, so very much depending on the practice of the studio, for, while one man almost encouraged resits as an advertisement, another distinctly discouraged them, and granted them with extreme reluctance.

Counsel having addressed the jury, his Lordship proceeded to sum up. He pointed out that, only too frequently, he was afraid, there was more or less dissatisfaction expressed at the efforts of the photographer. People did not say that it was not like them, but that they did not like the picture; but that did not of itself point to want of skill in the operator. It was not within human possibility to please all, and, naturally enough, some complaints had been made. But were they excessive? No witness had said they were. That in any one's experience some bad results must naturally be expected, and it was obviously unfair to get together some few out of many hundreds, and hold them up as fair samples of Mr. Illingworth's work. With regard to what had been termed the indecent prints, he saw nothing of beauty in a naked child, and doubted that such objects could be made to show art; and, although he should never desire such things, if parents come and say "I want them," then he thought that the operator was only exhibiting that forbearance and effort to please expected from him if he endeavoured to grant their request. With regard to the indecency, a limb might be moved, and a result obtained that was not desirable, but it did not show want of skill on the operator's part, and was met by Mr. Draycott's order, "Get their money and do something; and, if it is not liked, they can sit again." With regard to the cricket group, Mr. Illingworth says, "It is not high class, but the best I could do under the circumstances," and no witness could contradict this. With regard to the Bentley group, an unfortunate error had been, he was inclined to think, made, and it was, no doubt, especially under the circumstances, annoying to Mr. Draycott. "But, gentlemen, it is for you to consider if a single error such as this is sufficient to justify the defendant in dismissing this man, and sending him adrift without a character, and putting him in such a position that, in seeking another position, he has to say, in reply to the question, Why did you leave your last situation? "I was dismissed for incompetency." It would seem an unreasonable punishment, and out of all proportion to the error. If, then, gentlemen, you find the defendant has failed to support his action to your satisfaction, it remains for you to award such damages as you may consider the plaintiff rightly deserves."

The jury having retired, the foreman returned to the Court to ask what was the exact position with regard to the practising of the plaintiff within the area given in the agreement. The Judge held that, if Mr. Draycott had broken the agreement by dismissing plaintiff without sufficient reason, then he could not prevent Illingworth following his calling within the area mentioned in the agreement.

The jury found a verdict for plaintiff, with damages 200*l.*

EXHIBITION OF CANINE PHOTOGRAPHY.

Our contemporary, *The Stock-keeper*, in announcing an Exhibition of Canine Photography at the Agricultural Hall, on February 12, 13, and 14, says: "The remarkable progress which has taken place in photography during the last decade, and the wonderful improvements in the apparatus and appliances that are used in connexion with it, have transformed what was formerly an art almost exclusively in professional hands into one of the most popular pastimes. Photography has become a very useful handmaiden to a number of pursuits and professions, and the scope of its utility to the sportsman in general, and the breeder and exhibitor of dogs in particular, can hardly be over-estimated.

"For the purpose of impressing this fact upon the kennel world, and also with the idea of inducing those interested in dogs to pay greater attention to the proper application of art and correctness of position in canine photographs, we have made arrangements to hold an Exhibition of Canine Photography on the occasion of Cruft's Dog Show, at the Agricultural Hall, on February 12, 13, and 14, in a specially reserved portion of the gallery. The details of the programme are not yet completed, but, to give our readers a general notion of the plan that will be followed, we may mention that the competition will take place in the following classes:—

"Class 1.—The best portrait of a prize-winner.

"Class 2.—The best portrait of the head of a prize-winner enlarged to life size.

"Class 3.—The best photograph of a sporting dog at work.

"Class 4.—The best photograph of a recognised pack of hounds.

"Class 5.—The best photograph of a dog running or jumping.

"Class 6.—The best photograph of one or more dogs in a subject picture.

"Class 7.—The most interesting photograph of a dog from an historical point of view.

"Class 8.—The best photograph of a kennel establishment.

"All the photographs must be taken from life, and in Classes 1, 3, 4, 5, 6, and 8 no exhibit will be admitted of less than cabinet size.

"There will be no entry fee.

"An appropriate number of *The Stock-keeper* silver and bronze medals will be awarded in the various classes, and there will also be a large number of specials offered. Some of them will be for certain breeds in particular. A list of these will be published shortly, but there will be one special which should be of interest to all intending exhibitors at the show, viz:—

"A three-guinea cup (money or plate), offered by Mr. Chas. Cruft for the best photograph of a dog exhibited at the Show.

"Further particulars of *The Stock-keeper* Exhibition will be published in that journal of January 10."

PHOTOGRAPHIC COPYRIGHT UNION.

The following are the rules as amended at the General Meeting, November 22, 1895.

Committee.

President, Frank Bishop (Marion & Co.). *Vice-President*, Joseph J. Elliott (Elliott & Fry, Baker-street). *Treasurer*, Wm. Grove (Window & Grove, Baker-street). *Honorary Secretary*, J. Lillie Mitchell (London Stereoscopic Co., Ld.), 54, Cheapside, London, E.C. Wm. Downey (W. & D. Downey, Ebury-street), Alfred Ellis (Upper Baker-street), E. Frith (Frith & Co., Reigate), Jas. Lafayette (Dublin), Louis Wilson (G. W. Wilson & Co., Ld., Aberdeen). *Solicitors*, Messrs. Neish, Howell, & Macfarlane, 66, Watling-street, London, E.C. *Secretary*, Henry Gower, Photographic Section, London Chamber of Commerce, Botolph House, Eastcheap, London, E.C.

Title.

I.—The name of the Society shall be the "Photographic Copyright Union."

Objects.

II.—The objects of the Union shall be to secure and protect Photographic Copyrights, to suppress piracies, and generally to promote the interests of the profession.

Membership.

III.—Photographers who have given their signed adherence to the Union shall be considered duly elected, and all professional and amateur photographers and photographic publishers shall be qualified to become Members of the Union under the rules, provided they be introduced by a Member.

IV.—The Committee shall have the power of nominating as Honorary Members, free from any subscription, any persons resident abroad or in the colonies, whom they may in their discretion select as corresponding Agents for the Union.

Funds.

V.—There shall be a Donation Fund and a Reserve Fund. The Donation Fund shall be deposited in the name of the Union, and cheques drawn therefrom as per Rule XI. The Reserve Fund shall be deposited at the Bankers in the joint names of the President and Treasurer of the Union, and only in the event of a deficiency in the Donation Fund shall expenses be defrayed out of the Reserve Fund.

VI.—There shall be no Annual Subscription.

VII.—The Working Expenses of the Union shall be met by Voluntary Donations.

Reserve Fund.

VIII.—A Reserve Fund shall be created, to consist of Voluntary Donations and of such other funds as may be found available for the purpose.

Officers.

IX.—The management of the Union shall be by a Committee of nine Members (but with power to increase their number), two of whom shall retire annually, but shall be eligible for re-election. The Committee shall elect annually from among themselves a President, a Vice-President, and a Treasurer, and the Committee shall be Members of the Photographic Trade Section of the London Chamber of Commerce.

X.—The mode of Election of Members of the Committee shall be by the vote of the General Members of the Union.

XI.—The Bankers of the Union shall be the National Provincial Bank of England, St. Marylebone Branch, Baker-street, W. All cheques shall be signed by the Treasurer, and a Member of the Committee, and countersigned by the Secretary.

XII.—The Standing Counsel, Solicitors, and Secretary of the Union shall be appointed by the Committee, and shall hold office for such time and upon such terms as may be determined by the Committee. No Member of the Committee shall be eligible as Auditor.

Meetings of Committee.

XIII.—The Committee shall meet monthly on the first Wednesday in each month, but a Meeting may be called by the Secretary, upon the request of any two Members of the Committee. Three clear days at least must elapse between the issue of the notices (unless the Secretary shall mark them "very urgent") and the day for which the Meeting is called.

XIV.—Five shall form a quorum of the Committee, except where otherwise hereinafter provided. Questions arising at any Meeting of the Committee shall be decided by a majority of votes, and, in case of an equality of votes, the Chairman of the Meeting shall, in addition to his original vote, have a casting vote.

Accounts.

XV.—Proper books of account shall be kept at the offices of the Union, and all such accounts shall be audited by the Auditors once in every year, and oftener if the Committee shall so determine. The Auditors shall be elected by the Members of the Union present at the General Meeting. All moneys received by the Secretary shall be paid to the Treasurer within seven days.

General Meetings.

XVI.—A General Meeting of the Union shall be held in the month of October in each year, and of such Meeting seven days' notice shall be sent to each Member, together with the report (if any) of the Committee, and an abstract or short statement of the accounts of the Union, together with a note of any alterations of and additions to the Rules that may be proposed. Extraordinary General Meetings shall be summoned at any time, upon the requisition of twenty Members of the Union. At any such Meeting the Rules of the Union may be added to or altered by the vote of two-thirds of the Members present, provided that fourteen days, prior notice has been given to the Secretary stating the proposed additions or alterations. Fifteen Members shall form a quorum at such Meetings, and the Chairman shall have a casting vote.

Work of the Union.

XVII.—The Society will undertake to register the work of any Member who desires them to do so upon the payment of 1*s.* 6*d.*, which is inclusive of the fee of 1*s.* at Stationers' Hall, but the Union shall incur no responsibility in case any such registration shall be held to be defective by any Court of Law.

XVIII.—Any Member shall have the privilege of referring the application of any Publisher or other person, who may desire to copy his works to the Secretary to arrange terms for the same. A record will be kept of all licences and permissions negotiated by the Union, who shall be entitled to charge a commission of ten per cent. on all sums obtained by them in this manner for a Member.

XIX.—Members whose work has been infringed, and who wish the Union to obtain redress for them, must send the Secretary an original photograph, the piracy complained of, a copy of the registration form, the place and date of purchase of the piracy, and the name and address of the person by whom purchased, together with all correspondence that may have any reference to the piracy in question. The Secretary, having satisfied himself and any one Member of the Committee that the essential preliminaries to registration have been duly observed, shall then submit the case to the Solicitor, who will advise the Secretary upon it. A quorum of three of the Committee shall have power to give the Solicitor authority to proceed, but in urgent cases an action may be commenced by the Solicitor, should he deem it advisable, before the Committee have time to sit, but not before obtaining the written authority of the Member or Members interested, and in such cases, until the action of the Solicitor be ratified by three Members of the Committee, the Union shall not be liable for any costs.

XX.—If when a case, at the request of a Member, has been conducted by the Union, and compensation by way of penalties, or damages, or otherwise, be obtained, the net proceeds shall be divisible as follows: Two-thirds shall go to the Member whose copyright has been infringed, and one-third to the Reserve Fund of the Union. If no damages are obtained, then the expenses shall be borne as follows: Fifty per cent. shall be paid to the Union by the Member on whose behalf the action was taken, and thereafter fifty per cent. by the Union.

XXI.—In all cases where the aid of the Union has been invoked, and compensation obtained for a Member without litigation, the Union shall deduct twenty-five per cent. of the amount obtained after deducting expenses, and shall pay the balance to the Member.

XXII.—That the Committee, shall have the power, should they deem it advisable, to give such rewards as they shall agree upon to any one who give such information as shall lead to the conviction of an offender or to successful litigation.

☞ XXIII.—That no Member shall allow a Copyright picture belonging to him to be reproduced (whether registered or not), for a less fee than 10*s.* 6*d.* on each occasion, and for each different publication or form in which it is used, but he shall be at liberty to charge a larger fee according to his own ideas as to its value.

XXIV.—That Members be invited to seek advice and information of the Union through the Secretary, which shall be given free of charge.

XXV.—That the Society will assist Members in assigning Copyrights,

and help them in every possible way in all maters relating to Copyrights.

The following are—

COPIES OF FORMS ISSUED BY THE PHOTOGRAPHIC COPYRIGHT UNION.

[2d. per dozen.—*Prices include Postage.*]

FORM A.]

Photographic Section of the London Chamber of Commerce.

BOTOLPH HOUSE, EASTCHEAP.

Photographic Copyright Union.

In reply to your request for permission to copy my photograph of.....

.....I beg to state that, being a Member of the above Photographic Copyright Union, I am bound by its regulations to make a charge for the permit required. My fee in this case will be .....and on receipt of this amount I will forward you official permission. .....

.....

NOTICE.—Any one copying my photographs for the purposes of reproduction or illustration either in Newspaper, Magazine, Book, or any other form, without first obtaining my permission, render themselves liable to an action for infringement of my copyright.

FORM B.] Receipt granting permission to use Copyright Photographs.

Issued by the Photographic Copyright Union.

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Our Editorial Table.

LETTS'S PHOTOGRAPHER'S POCKET DIARY FOR 1896.

London: Charles Letts & Co.

THIS is a neatly got-up little diary, in which a great deal of tabular matter, practical hints, and information likely to be of use to amateur photographers has been incorporated. Plenty of space is given for recording particulars of exposures, but not enough, we think, for the diary pure and simple, sixteen days being provided for within the space occupied by a quarter-plate. Apart from this, however, it is a useful and handy book. It contains a directory of hotels, photographic dealers, and cycle-repairers. The editor of the diary, Mr. E. J. Wall, has done his work extremely well.

RECENTLY ELECTED OFFICERS OF SOCIETIES.

(*Received too late for the* ALMANAC.)

AMATEUR PHOTOGRAPHIC ASSOCIATION OF VICTORIA.—Established 1893. Meetings held at the Royal Society's Rooms, Melbourne. *President:* Mr. E. A. Walker.—*Vice Presidents:* Dr. J. C. Kaufmann and Mr. Edgar C. Bell.—*Committee:* Messrs. W. Farquaar, G. H. Heather, J. H. Mulvany, D. W. Paterson, H. Small, H. C. Ward, C. W. Watts, and E. Wood.—*Treasurer:* Mr. F. W. Miscamble.—*Secretary:* Mr. J. H. Harvey, 127, Gipps-street East, Melbourne, Australia.

AVON VALE PHOTOGRAPHIC SOCIETY.—Meetings held at Elmhurst, Batheaston, Bath, first Tuesday each month. *President:* Colonel Sealy.—*Committee:* Messrs. W. M. Ashman, C. Ward, W. Hinde, Rev. F. A. Purvis, and Messrs. J. W. Hooper, J. Weston, and H. Stratton Coles.—*Secretary and Treasurer:* Mr. W. H. Crossman, Kelston Villa, Batheaston, Bath.

FINSBURY TECHNICAL COLLEGE PHOTOGRAPHIC SOCIETY.—The meetings are held at five o'clock on Wednesdays once a fortnight. *Patrons:* Sir Philip Magnus, B.A., B.Sc., and Messrs. J. Perry, M.E., D.Sc., F.R.S., A. F. Brophy, and S. P. Thompson, D., Sc., F.R.S.—*President:* Mr. R. Meldola, F.R.S., F.I.C., F.C.S.—*Vice-Presidents:* Messrs. J. Castill-Evans, F.I.C., F.C.S., and E. Thomas, B.Sc.—*Committee:* Messrs. J. C. Tell, F.C.S., F. W. Bunyan, Powell, and L. H. Andrews.—*Hon. Treasurer:* Mr. T. H. Norris, A.J.C.—*Hon. Secretaries:* F. R. H. Wood and H. F. E. Hulton.

GORDON COLLEGE AMATEUR PHOTOGRAPHIC ASSOCIATION.—Established 1889. Meetings held at Gordon College, Geelong. *Patron:* Mr. Phillip Russell.—*President:* Mr. H. G. Roebuck.—*Vice-Presidents:* Messrs. J. R. Leitch and G. H. Brinsmead.—*Committee:* Messrs. C. O. Dentry, A. Furnell, J. F. Miller, A. E. Brathley, and W. M. Waddell.—*Treasurer:* Mr. W. H. Thacker.—*Secretary:* Mr. John Hammerton, jun., 73, Little Ryrie-street, Geelong, Victoria.

HANDSWORTH PHOTOGRAPHIC SOCIETY.—Meetings are held at Headquarters, second floor, College House, Hamstead-road, Handsworth, and not at 18, Albert-road, Handsworth, as given in ALMANAC.

KENT POSTAL CAMERA CLUB.—Formed 1895, consisting of fifteen members, having a portfolio and note-book in monthly circulation. *Hon. Secretary:* Mr. A. P. FORD.

LENS, SUN, & COMPANY POSTAL PHOTOGRAPHIC CLUB.—Limited to twelve members. Circulates monthly folios, in which the members criticise each other's pictures. Occasional articles on photographic subjects are written by the members. *Hon. Secretary:* Mr. Ward Muir, 4, Victoria-road, Waterloo, Liverpool.

LLANDUDNO CAMERA CLUB AND LANTERN SOCIETY.—Established 1892. Meetings held at Club House, Bodhyfryd-road, Llandudno (near Post Office). *President:* Right Hon. Lord Mostyn.—*Vice-Presidents:* Dr. Dalton, J.P., and Messrs. A. H. Hughes and Elias Jones, J.P.—*Committee:* Messrs. Ashby, Campbell, Eccles, Jones, Watterson.—*Treasurer:* Mr. W. Williams.—*Secretary:* Ernest Deacon, Gladdaeth-street, Llandudno.

OLDHAM PHOTOGRAPHIC SOCIETY.—*President:* Mr. James Brooks.—*Vice-President:* Mr. John Chadwick.—*Committee:* Messrs. J. Greaves, jun., C. A. Hempstock, T. Heywood, James Hall, B. J. Holt, and W. A. Nash.—*Librarian:* Mr. John W. Cooper.—*Treasurer:* Mr. J. Hilton Ashton.—*Hon. Secretary:* Mr. Thomas Widdop, 17, Queen-street, Oldham.—*Assistant Secretary:* Fred Megson.

STAFFORD Y.M.C.A. AMATEUR PHOTOGRAPHIC SOCIETY.—Established 1895. Meetings every alternate Monday in the Y.M.C.A. rooms. *President:* Mr. H. Cliff.—*Vice-President:* Mr. F. Fowke.—*Committee:* Messrs. M. Averill, W. Kirkham, W. H. Rostance, R. Hourd, and C. J. Flint.—*Hon. Secretary* and *Treasurer:* Mr. F. Cliff, 11, Gaol Gate-street, Stafford.

WELLINGTON CAMERA CLUB.—Established 1892. Meetings held at Academy of Fine Arts. *President:* Mr. A. de B. Brandon.—*Vice-Presidents:* Messrs. A. McKay and J. McLellan.—*Committee:* Messrs. G. Crichton, E. H. Freeman, T. M. Hardy, A. B. Keyworth, T. Pringle, and William C. Stephens.—*Treasurer:* Mr. T. M. Hardy.—*Secretary:* Mr. Frank J. Denton, 33, Willis-street.

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, January 14, at 8 p.m., at 12, Hanover-square, W. *Astigmatism and a new Astigmatic Portrait Lens*, by Mr. H. L. Aldis, B.A. (Cantab.).

THE WATKINS DEVELOPING COMPETITION AT THE PHOTOGRAPHIC CLUB.—We are informed that the Judges in this Competition have awarded the first prize of 4*l.* 4*s.* to Mr. B. J. Edwards, and the second prize of 2*l.* 2*s.* to Mr. B. E. Edwards.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, January 15. Mr. J. S. Sunderland (Messrs. Newnes & Co., Limited) will read a paper on *The Engraving and Printing of Half-tone Blocks*, illustrated with examples. Visitors are always welcomed by the members.

Mr J. W. Waterhouse, R.A., has lately been experimenting in lithography, and we understand that a drawing made by him specially for the *Studio* will be given away as a supplement with the mid-January number of that publication.

A Screen for Photo-mechanical Printing.—Mr. Edouard G. D. Deville, of Ottawa, Canada, in order to change the continuous tones of an original into tones formed of black and white dots by a screen placed in front of the photographic plate, has devised a new kind of screen, furnished with alternate opaque and transparent squares, disposed like the squares of a chessboard.

Messrs. Fuerst Brothers, of 17, Philpot-lane, E.C., write: "It may interest you to know that we have appointed Mr. T. Donald Watson (for over thirty years with Messrs. Johnson's, Cross-street, Finsbury, E.C.) to manage our Photographic Department, and he will devote special attention to nitrate of silver, chloride of gold, developers, and all other photographic chemicals."

The *Photographic Times* Publishing Association, of New York, write: "Having noticed it stated in an English contemporary that the *Photographic Times*, owing to copyright complications, is no longer obtainable in England, we ask you to be kind enough to publish the fact that such is not the case. While it is true that we no longer have an authorised English agent, yet we are open to receive subscriptions from any country. As a special inducement to English subscribers, we make no extra charge for postage, and intend in future mailing the magazine, wrapped in such a manner that it will reach distant subscribers in good condition."

Patent News.

The following applications for Patents were made between December 23 and 31, 1895:—

Lanterns.—24,560. "An Improved Method of and Apparatus for Exhibiting Pictures by means of an Optical Lantern or otherwise, parts thereof being applicable for other analogous purposes." W. J. Spurrier.

Printing Plates.—24,593. "Improvements in Photographic Printing Plates." G. Poore.

Lenses.—24,641. "Improvements in Photographic Lenses." T. R. Dallmeyer.

Apparatus.—24,737. "Improvements in Photographic Apparatus." Communicated by Auguste Tournier, France. B. J. B. Mills.

Cameras and Dark Slides.—24,886. "Improvements in Photographic Apparatus or Cameras for Amateurs, and in the Plate Receptacles connected therewith." I. de Balás.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
13	Camera Club	*Optics and Lenses.* Lyonel Clark.
13	Richmond	*The Speed of a Plate.* R. Child Bayley.
14	Brixton and Clapham	*Lantern-slide Making.* E. Dockree.
14	East London	*Platino-bromide Paper, &c.* Nahum Luboshez.
14	Royal Photographic Society	*Astigmatism and a New "Stigmatic" Portrait Lens.* H. L. Aldis, B.A. (Cantab.).
15	Croydon Camera Club	Lantern Night for Members' Slides.
15	Croydon Microscopical	Visit to Brin's Oxygen Works.
15	Leytonstone	Demonstration on the Platinotype Printing Process. T. H. Stringer.
15	Photographic Club	*The Engraving and Printing of Half-tone Blocks.* J. S. Sanderland.
16	Bradford	*Home Portraiture.* T. C. Bridges.
16	Camera Club	Views in the Himalayas, with *Notes on the Photographic Needs of Mountain Explorers.* Sir W. Martin Conway.
16	Darwen	Smoking Concert.
16	Leeds Camera Club	*The Optical Lantern and its Use.* A. Bourke.
16	Leigh	*Copying.* T. Haddock.
16	Liverpool Amateur	Demonstration on Bromide Printing. F. Anyon.
16	Oldham	Enlarging. The Members.
17	Birkenhead Photo. Asso.	*Retouching.* Mr. Walton.
17	Croydon Microscopical	Slides of Alpine Scenery. Captain W. de W. Abney, C.B., &c.
17	Southport	Lantern Slides.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

January 2,—Mr. A. Haddon in the chair.

The Hon. Secretary showed the result of a further trial of the Cooke lens at *f*-45 without the mask, whereby the field was increased by about an inch.

Stereoscopy on the Screen.

Mr. T. E. Freshwater then read a paper on *A Simple Method of Projecting Stereoscopic Pictures on the Screen by means of Two Ordinary Lanterns.* [See page 24.]

Mr. R. P. Drage asked if the density of the coloured glasses could be lessened?

Mr. T. E. Freshwater answered that the screen should be of such a colour value that when you look at the picture through the green glass, closing one eye, you should only see a green picture, and so with the red. Thinking it possible that he could get a little more light by the use of some reds of a shade lighter tint, he had tried the experiment, but found they were quite useless.

The Chairman said, Why go to the expense and trouble of binding each pair of slides with different colours, when by putting two pieces of glass only, suitably worked, on the hood of the lens, one could do away with all that. He thought that the two images should be brought as nearly as possible to registration on the screen, as, when there was much lateral separation, a peculiar and disagreeable sensation was caused in the eye.

Mr. T. Bedding asked as to the possibility of using one lantern only.

Mr. Freshwater replied that the superposition of the two colours would stop too much of the light.

Mr. W. E. Debenham asked for the opinions of those present as to why, when the head was shifted, the distant objects appeared to move in a contrary direction to the head, and gave his opinion.

A visitor said that, on looking at the screen without the eyepieces, the picture appeared to be double the size as when viewed through the spectacles, and inquired whether it was a defect in his eyesight.

Several others present noticed the same peculiarity.

Mr. Freshwater thought that, when viewed stereoscopically, the pictures lengthened out and so appeared to be smaller.

The Hon. Secretary thought that the glasses used in showing certain of the slides were of a deeper tint than the others, but this was contradicted by Mr. Freshwater.

Mr. Debenham said the fact that some people's eyes were more sensitive to the red, and some to the blue, would probably explain the apparent difference in the glasses.

Mr. Freshwater admitted that the tints of the reds might vary somewhat, but the blue were all of a kind.

Mr. Haddon repeated that, with properly worked glass, he could see no reason why the screens should not be attached to the hood of the lens.

Mr. J. B. Spurge mentioned that at a Mr. Crowther's request he had experimented in the same way, and with the same success, excepting the want of light in the picture. He also briefly described another variation by which he obtained a good stereoscopic effect without loss of light.

PHOTOGRAPHIC CLUB.

January 1,—Mr. E. W. Foxlee in the chair.

The report of the Judges in the Watkins Competition was made verbally to the meeting. This, and a report of the discussion which ensued, will be published next week.

Brixton and Clapham Camera Club.—December 31, Mr. J. W. Coade (President) in the chair.

Experiments with Light

was the subject treated of by Mr. J. C. Osborne in a manner which proved both interesting and instructive. Commencing with a mention of the now generally recognised undulatory theory of light transmission, he explained, by means of diagrams and numerous practical experiments, various points connected with the phenomena of light-absorption, transmission, and reflection by plane surfaces, the refraction of light by passing through mediums of varying densities, and the inversion of the image as seen on the focussing screen of a camera. The analysis of white light was shown by placing a prism in the beam of light projected by the limelight lantern, and variations in the spectrum, produced by burning foreign bodies, as copper foil and phosphorus, in the lantern flame. Colour formation was also touched upon, and the dependence of a substance, whether liquid or solid, for its colour upon its chemical composition was exemplified by a number of characteristic chemical reactions, *i.e.*, the familiar one of adding to a solution of silver nitrate an equally colourless solution of sodium chloride, thus producing a white precipitate of silver chloride. The relation of light to energy was shown by the radiometer, and the chemical effects of light are so well known to photographers as to require no illustration. Perhaps the most useful part of the demonstration, however, consisted in the spectroscopic examination of different samples of ruby and orange glass used for developing lamps, proving it quite possible to so illuminate the dark room as to allow development to be comfortably watched, and, at the same time, without risk of fogging even the most sensitive plates, provided a suitable medium is chosen. So important was this part of the demonstration considered, that it is proposed to add a prism to the Club apparatus, thus affording members an opportunity of testing their own medium as required. The demonstration concluded with the production of an artificial rainbow. By forcing water under a pressure of 200 pounds per square inch through a small orifice, it issues in a very finely divided state, and the rays of the lantern shining on the spray thus produced forms upon the screen the colours of the spectrum. A vote of thanks was awarded to Mr. Osborne for this, his first demonstration, after which the discussion upon the subject, the election of three new members, and the nomination of officers for 1896 brought to a close a successful and somewhat lengthy meeting.

Croydon Camera Club.—The meeting on New Year's Day was the first of a series of "Novices' Nights," intended to show beginners the way in various photographic walks. The subject,

How to Make a Lantern Slide,

was handled in a thoroughly practical and complete manner by Mr. A. E. Isaac, than whom it would be hard to discover a more capable or reliable

guide. His demonstrations and remarks not only informed the tyro, but included much that some of the old hands present were glad to make a note of. At the conclusion the large gathering gave Mr. Isaac a flattering vote of thanks. Amongst many other prints shown during the evening, notable were several exhibited by Mr. J. Noaks. These were on gelatino-chloride paper, and had been printed by means of an ordinary incandescent gas burner, using mantle C, the time taken being within two hours. The practical importance of this proof of the availability of the above light can only be ganged by those having to deliver silver prints at this time of the year. In some instances a fitful daylight has not been sufficient to obtain one print. Mr. Noaks estimated that, by exposing a number at once, an incandescent burner would print about twenty to twenty-five cabinets a day, and the cost would be nominal. Mr. H. T. Thornton was elected a member.

Woodford Photographic Society.—January 2, Mr. E. B. Caird in the chair.—Mr. Marriage showed a lantern slide developed with sacchrate of lime; he spoke of it as being a very rapid developer. The Chairman showed some Eastman films of snap-shots exposed in August 1893, and only just developed. Two or three gave very good results, but two or three others exhibited marks evidently caused by pressure of elastic bands used in packing the films after exposure. It was decided to apply to the Royal Photographic Society for the loan of a set of lantern slides and Mr. Warnerke's paper on the development of printing-out papers.

Bradford Photographic Society.—A new venture was attempted by the above Society on Thursday, January 2, in the shape of a ladies' and children's night, which proved to be a remarkable success. The proceedings took the form of a dioramic entertainment kindly provided by Messrs. R. J. Appleton & Co., of Manningham-lane, who put forth every effort, and spared neither time nor expense to make the evening enjoyable for all. Mr. Appleton himself manipulated his magnificent triple lantern, and rejected many hundred charming views, comic moving fairy tales, and others upon the screen, to the delight of over 300 members, lady friends, and children. At short intervals songs were rendered by Miss Lily Ellison and Master Harry Berry, and humorous recitals by Mr. Alex. Keighley and Mr. E. H. Scales. A hearty vote of thanks was accorded to Mr. R. J. Appleton and his staff, and all who had contributed for their kindness in providing such a splendid evening's enjoyment. A box of sweets was handed to each child, with the compliments of the Bradford Photographic Society. It is to be hoped that a night similar to this may be indulged in once every season.

Leeds Camera Club.—The Judges' reports and criticisms on prints handed in for the Leeds Camera Club 1895 Competitions were read at the fortnightly meeting of this Society on Thursday evening last. The total number of competitors in the various classes was twenty, several of whom had entered for two or more subjects. An analysis of the competitions shows that sixteen members sent 102 prints in the Landscape Section; 32 prints were submitted by twelve competitors in the Architectural Class; 21 by seven members in Portraiture; and 20 by three members in the Snap-shot Division. Mr. Alex. Keighley (the President of the Bradford Photographic Society) judged the landscape photographs, and the Rev. Mr. Addison (President of the Wakefield Photographic Society) acted in a similar capacity in the remaining classes. The Judges' criticisms upon the work submitted, individually and collectively, were much appreciated, and the valuable hints they kindly tendered will doubtless, be acted upon, and be evinced by a higher standard of work in future competitions. The prizes were awarded as follows:—Landscape: (1) silver medal and certificate, A. Gaunt; (2) bronze medal and certificate, W. R. Irwin; (3) certificate, G. Roberts. Architecture: (1) silver medal, A Homburg; (2) bronze medal, J. Sedman; (3) certificate, W. Bottom. Portraiture: silver medal, E. C. Oddy. The awards in the Snap-shot were withheld, there being insufficient competitors. The Rev. Mr. Addison, who personally read his report, afterwards kindly criticised a large number of members' lantern slides, which were exhibited on the screen. It has been found necessary to postpone Mr. J. W. Garbutt's lecture on *Wet-collodion Lantern Slides*, announced for January 16, and Mr. Bourke has undertaken to fill that date with a practical demonstration on *The Optical Lantern and its Use.*

FORTHCOMING EXHIBITIONS.

1896.	
February 27-29	Woolwich Photographic Society.
March 2-6	*South London Photographic Society. Hon. Secretary, Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.
3-6	*Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

GRAINED NEGATIVES.

To the EDITORS

GENTLEMEN,—As there seems to be a difference of opinion as to the cause of dots spreading in making grained negatives for process work, I should like, with your permission, to state my views of the question, in the hope of eliciting the truth from some of your scientific readers.

I believe it is said that the enlargement of dots is not caused by diffraction, but by the light reflected from a considerable area of the original subject acting through one opening in the screen (in fact, by lateral action). I think this to be a mistaken idea, for, in my opinion, each screen opening only allows that light to pass which is projected normally from the point corresponding to it in the original; and the size of dot I consider to be ruled, partly by exposure, partly by development and intensification, and partly by diffraction, which varies much with the distance between the screen and the plate, besides chemical actions. Apologising for troubling you with such an uninteresting subject,—I am, yours, &c, J. A. C. BRANFILL.

25, *Rosendale-road, West Dulwich, S.E., January* 6, 1896.

HEAT AND TONE.

To the EDITORS.

GENTLEMEN,—The effect of heat upon the colour of some photographic prints, described by Mr. Blunt in your last issue, will not be new to most professionals.

It is, of course, well known that, after passing a silver or gelatine print through the burnisher or hot roller, the tone is almost always altered to a shade or so warmer, the degree depending upon the heat of the burnisher, and also upon the brand of paper. I recollect passing a print on collodio-chloride paper, which had been carried as near black as is possible with the sulphocyanide bath, through a very hot burnisher, from which it emerged a brilliant maroon colour. It was, of course, blistered.

To alter the colour of a silver print materially, it is necessary that the burnisher should be very hot, so much so that the print will be covered with blisters, and the only way of avoiding this is to burnish the prints at the usual temperature some time previously, which appears to have the effect of hardening them.

I do not know what the chemical explanation of the change is, but, so far as observation goes, the colour of prints whose tones have been modified by heat are quite as permanent as that of those which have never been rolled.—I am, yours, &c., R. WELLER.

Sandycombe, Kew-gardens, S.W., January 4, 1896.

POISONING BY SULPHOCYANIDE.

To the EDITORS.

GENTLEMEN,—If I may trespass on your space a little, I should like to give a warning to those who may think they are impervious against the many modern solutions, as Mr. J. Pike calls them in his article of the 20th inst. I read his article whilst suffering from blood-poisoning in my right arm, caused through knocking a piece of flesh off the knuckle of my little finger, and then, immediately after, toning a large batch of prints in the sulphocyanide bath. I have been in the profession for nearly twenty years, and nothing has ever affected me before; but, as Mr. Pike says, your time will come, and mine has, for it kept me away from business five weeks, which means a considerable loss at the Christmas season.

Hoping this may be just an example to prevent others doing likewise, apologising for taking so much space, and wishing your paper every success for the coming year, I am, yours, &c., F. W. TASSELL.

West Hill Drive, Mansfield, December 31, 1895.

To tone a carbon transparency to a rich black, first immerse it in a weak —say a one per cent—solution of the perchloride of iron until the film is thoroughly permeated, then well rinse under the tap, and afterwards flood the plate with a two grain solution of gallic acid, and keep on till the desired tone is obtained. A great variation in black tones may be made by substituting other salts of iron for the one named, and, instead of using gallic acid, employing a solution of tannin, or a decoction of gall nuts, or one of logwood, &c. These latter agents yield more purple blacks than the gallic acid. In the event of the tones not turning out those desired, the colour can be quickly removed by flowing the plate over with a very weak solution of hydrochloric acid—thirty minims to the ounce of water. Then, after washing out the acid, the toning can be repeated with any of the other substances named.

If we require a greenish blue colour, to give a moonlight effect, we immerse the transparency in a dilute solution of protosulphate of iron, and, after rinsing, pour over it a solution of ferrocyanide of potassium. Prussian blue will be found in the film. A yellow, suitable for sunset effects, is obtained by first treating the slide with a solution of bichromate of potash followed by one of acetate of lead, chrome yellow resulting. A bright red colour is produced when the transparency is first treated with a solution of bichloride of mercury, and, afterwards, with one of iodide of potassium. It will now be seen that the "toning" of carbon transparencies is precisely analogous to the dyeing of fabrics, so that any colour obtainable by double decomposition can be secured in a carbon transparency. As there is no gelatine in the high lights to be dyed, they remain clear and free from colour.—E. W. FOXLEE *in* "*Autotype Notes.*"

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPH REGISTERED :—

Mr. G. B. Cowen, Ramsey, Isle of Man.—*Photograph of junction of two lanes, with children blackberrying, at Elgin Glen, near Ramsey, Isle of Mon.*

LENSES.—F·8. The lenses of the three makers named have excellent reputations for good qualities.

FINISHING.—R. FORTUNE. We know nothing of the work, neither have we seen a specimen. Why not write to the advertiser for one, or ask for particulars?

TAYLOR'S EXPOSURE TABLES.—EXPOSURE. Refer to the JOURNAL of August 23 last, in which the author of the table has an explanatory article. If this does not assist you, write again.

DEVELOPING.—C. M. BASTOW. To obtain density with eikonogen, allow plenty of time. Allow the negative to attain a greater density in the developer than appears necessary with pyrogallic acid.

ROUGH PAPER.—C. READER. Whatman's rough drawing-paper, such as is used in rough-paper photographs, may be obtained from any of the artists' colourmen, such as Newman's, Rowney's, Winsor & Newton, &c.

PHOTOCHROMS.—R. L. S. says: "Can you inform me of the names and addresses of English firms who do the colour printing—such as those views done in Switzerland, now in shop windows?"—In reply: The address is the Photochrome Co., 61-63, Ludgate-hill, E.C.

SUBSTRATUM.—COLLODION. Take the white of one egg and remove the germ, put it into a large bottle with a quart of water and a few drops of ammonia. Add some broken glass and shake up for a few minutes, then filter for use. It may be flowed over the glass while it is wet.

TONING.—T. SAWYER. The mealiness in the prints is due to the bath being used directly it was mixed. The proportions—thirty grains of acetate of soda; water, eight ounces; chloride of gold, one grain—is quite correct; but the solution should be made at least twenty-four hours before it is used.

DRY COLLODION.—P. C. FREWIN. We do not see how you could well fail with the process as given, unless too much of the silver was washed out of the film before the albumen was applied. The collodion should be of a very porous nature for this process, and the development conducted with acid pyro and silver.

RETOUCHING.—S. OSBORNE. The fault with the retouching on the negative sent is twofold. First, far too thick a coating of the medium was applied in the first instance; second, too soft a pencil was used for the work. B and HB grades are seldom used, except in extreme cases. H, HH, and HHH are those most generally employed.

RESIDUES.—WASTE says: "I am purposing inserting pipes in my developing and toning sinks to take away the old fixing from one, and silver washing from the other. Can you recommend the sort of piping for this? The casks to hold the waste will be some four or five feet away."—Plumbers' ordinary lead pipe will do as well as anything.

PRINTING.—The faults in the print forwarded is that they are over-toned. The primary fault, however, is in the negatives. They are far too weak to give prints that will bear toning much beyond the red stage. No toning bath will yield purple tones with such thin negatives to print from. The negative has as much to do with the tones as the toning bath.

PANORAMIC CAMERA.—A. A. P. writes: "If A. Dixon requires one of the old clockwork pantoscopic cameras for taking panoramas of 180° on a flat $7\frac{1}{4} \times 4\frac{1}{2}$ plate, I believe Miss Johnson, Photographer, Dodsworth's-court, Briggate, Leeds, has one of the original ones. The price was about 15*l.* to 20*l.* If she has it yet, it might require cleaning up, but she would sell it cheap."

ENLARGING.—M. T. SMITH says: "I have a lantern by ——, and the other night I tried to make some enlargements with it. Although the image was focussed sharply, the enlargements, one and all, were miserably out of focus when developed. Can you explain?"—Yes. The optical and chemical foci of the objective do not coincide. This is the case with the objectives of many lanterns, and it is of no disadvantage for projection purposes alone; indeed, it is rather an advantage that they do not.

YELLOW SCREENS.—MR. R. SMITH says: "I shall be glad if you will give me the formula for a screen that will cut off the violet and ultra-violet rays, so that I can successfully use it with an ordinary plate in photo-micrography. Mr. Ives mentions such a screen in THE BRITISH JOURNAL OF PHOTOGRAPHY, but does not give the formula; if he has such a screen for sale, I shall be glad to buy."—In reply: Possibly some of our readers, or Mr. Ives, will give the desired information.

STRIPPING NEGATIVES.—B. T. The negatives should be alumed before they are stripped, then they will not expand to any great extent. If there should be any expansion at all, the film may be reduced to its original size by immersing it in alcohol. Instead of using sulphuric acid, employ hydrofluoric in the proportion of a few drops to the ounce of water. Cut round the figure while it is on the glass before stripping, then float it into the position it is to occupy in the other negative which has been prepared to receive it.

PRINTING.—F. M. asks: "Could you advise us how to prevent printing-out paper from sticking to the negative if left in the frame over night? The recent damp weather has caused us a lot of trouble, living as we do near the seaside."—If the paper, negative, and the pads are made perfectly dry when they are put in the frame, there will be no sticking. When the prints are left in the frame all night, the latter should be stored in a dry place.

COLLOTYPE.—W. S. G. writes as follows: "Can you tell me where I can obtain plates prepared for collotype, *i.e.*, ready for exposure; or, if not ready-sensitised, that can be sensitised by the user? I have looked through several numbers of the JOURNAL and the advertisements in the ALMANAC, but can get no information."—The plates are not articles of commerce, and for this reason they must be used within a day or two of their being prepared, as they will not keep, and they are always made in the sensitive state by those who use them.

TONING.—J. says: "The toning bath for Eastman's Solio paper is about forty grains of sodium acetate and about three grains of ammonium sulphocyanide to a grain of gold. I think this is near the proportions. Will you please say if a good bath can be made without the soda, and should the sulphocyanide be increased? I have a friend who appears to have only two solutions, viz., gold and sulphocyanide, and mixes just before use in cold water."—A toning bath may be made which answers well with some papers; it is made in the proportion of fifteen grains of the sulphocyanide to one grain of the chloride of gold; but whether it will work well with the paper named we cannot say, as we have never tried it.

CAMERA OBSCURA.—R. H. writes as follows: "On page 583 of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1896 there is an article on *Photographers as Draughtsmen*, and a description of a portable camera obscura. Will you be good enough to inform me: 1. In which number of your JOURNAL the article originally appeared? 2. What should be the diameter of the lens of fifteen-inch focus, and the diameter of the diaphragm? 3. What sized picture will a lens of this focus give?"—In reply: 1. June 28, 1895. 2. Any photographic lens that you may happen to possess worked with its full aperture, or a single non-achromatic lens may be used for the purpose with a stop of about *f*·10. 3. According to the form of lens. One of the rapid type, about twelve by ten inches; a single lens, about ten by eight.

GREASE.—R. G. W. says: "A careless assistant in the mounting room has got two or three drops of sweet oil on a finished enlargement on bromide paper. The spots are not on the face but on the drapery, but they quite spoil the picture. Unless I can get them out I shall have to get another done at a cost of something like thirty shillings. In the event of the picture being ruined past restoring, can I legally stop its cost from the girl's wages?"—We answer the latter query first by saying No, unless the damage was wilfully done. The picture can, however, be repaired. Take some pure benzole and apply a little to the grease spots, and, in a few seconds, blot off with clean blotting-paper. Repeat this treatment until the grease is entirely removed. The benzole must be the best, or it may leave a stain.

FOGGED PLATES; INTENSIFICATION.—G. B. says: "1. A little time ago I bought a hand camera which I believe is quite light-tight, and yet all the plates fog with the shortest exposure, soon after development is commenced. How is this? Is the aperture of lens too large? I put a piece of ground glass in the camera, and focus the picture, which seems brilliant enough, I then put a plate in, and come straight out of the dark room and expose at once, even keep the camera wrapped up to make sure. 2. Ought negatives (which have been fixed) to be intensified in the dark room, or in the daylight? And what is the cause of a heavy veil all over, making them so dense; I cannot get a print in sunshine in less than a day?" In reply: 1. Difficult to assign the cause on the few details given. Have you ascertained that the light of your dark room is safe? This may be the source of the trouble. 2. Intensification may be conducted in daylight. You appear to have over-intensified.

COLOURED FLAMES; FINDERS; OIL LAMPS.—ALPHA says: "I will feel obliged if you could give me—1. The names of any salts or chemicals soluble in alcohol, so as to give a red flame, a blue flame, and a yellow flame separately. 2. What is the arrangement of lenses in the new Brilliant finder, such as is advertised by Adams? Is it an object glass of a double convex, a mirror and a double convex for eyepiece? 3. Is Mr. Hay Taylor, who edited the *Optical Lantern Journal*, a son of the late Mr. J. Traill Taylor? 4. Do you consider the Pumphrey lamp No. 1, or Stock's No. 2, or the ordinary four-wick, with W-shaped burner No. 3, the most powerful light? Is there anything better in the market for oil?"—In reply: 1. Possibly some of our readers will give the desired information. 2. We have not examined the finder. Ask Messrs. Adams & Co. 3. Yes. 4. You have probably mentioned as good oil lamps as there are, but it is opposed to our rules to make the kind of comparisons you invite.

SMALL LANTERNS.—S. L. S. says: "In looking over some old cuttings from your paper, I came across the following in the report of a lecture by Mr. W. I. Chadwick, on *Small Lanterns and Dissolving Views*. He says: 'The practicability of reducing the size and diminishing the weight of magic lanterns occupied my attention many years ago.' In the BRITISH JOURNAL OF PHOTOGRAPHY, of May, 1878, I published a description, with illustrations, of two small lanterns which I had constructed. The illustrations and descriptions were republished in the *Magic Lantern Manual* of the same year. This appeared about October 28, 1892. Can you give me the *exact* reference of this description, or if the number is out of print? Can you tell me anything about the *Magic Lantern Manual* of that year; whether it is possible to obtain it and where?" In reply: The number referred to is out of print. The *Magic Lantern Manual* may possibly be obtained of Messrs. Warne & Company, Bedford-street, W.C., or of the author, Mr. W. I. Chadwick, 2 St. Mary's-street, Manchester.

THE BRITISH

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EX CATHEDRÂ.

On Monday afternoon, a meeting convened by the Electrotypers, Stereotypers, Process, and General Engravers' Associations was held at Anderton's Hotel, the main object of which was to consider the present "cutting of prices" by process-block makers, with the view of providing a remedy for the existing state of things, which is admitted throughout the trade to be an undesirable one. Out of fifty-eight London firms of process-block makers, forty-six were represented at the meeting. It is a pity such a meeting was not held a year or two ago. Our readers are aware that we have, from time to time, commented on the severe competition in process-block makers' charges, and have urged them to come to some common understanding with regard to an agreed scale.

* * *

A long, earnest, business-like discussion took place in which, besides Mr. Boutall, the Chairman (who very ably conducted the proceedings), Mr. Carl Hentschel, Mr. Fuchs, Mr. Cameron Swan, Mr. P. H. Waterlow, Mr. D. S. Dallas, Mr. L. E. Clift, Mr. Wilson, Mr. Swain, and other process-block makers took part, the feeling of the meeting being distinctly in favour of agreed minimum prices for line work on zinc, and half-tone work on zinc and copper. The upshot of the discussion was the carriage of a resolution, binding those present to state by ballot their views as to what those prices should be, the intention being to subsequently ascertain the average of the prices mentioned. Probably it will be found that the prices will come out something like 3½*d.* per inch for line work, with a 3*s.* 6*d.* minimum; and 9*d.* and 9*s.* for half-tone blocks.

* * *

We sincerely congratulate the process-block makers on their virtual unanimity in the desire to kill the insane cutting of prices that has recently prevailed among them, and we hope that they will not only come to some agreement in the matter, but will individually keep to it. At the meeting it was mentioned that 1½*d.* per square inch for line work, and 3½*d.* per square inch for half-tone work were now quoted—absurdly low prices, as was pointed out. The example set by the process men is an excellent one that we commend to portrait and other photographers as eminently worth imitating and profiting by.

* * *

The Transvaal crisis has elicited the fact that Messrs. G. W. Wilson & Co., the well-known photographers of Aberdeen, possess a fine collection of views of Cape Colony, Natal, Zululand, and the Transvaal that were specially taken for them some years ago. Dr. Jameson's unfortunate *faux pas* has turned the eyes of the world towards Johannesburg and Pretoria, which, judging by Messrs. Wilson's photographs, appear to be handsome places. Doubtless, Messrs. Wilson have recently found a brisk demand spring up for all their South African photographs, with, perhaps, the exception of the Majuba Hill series.

* * *

The Hon. Secretary of the Brixton and Clapham Camera Club, Brixton Hall, Acre-lane, Brixton, S.W., writes us: "You will be materially adding to the obligations this Club is under to yourself by sparing us, if at all possible, a line or two in next week's issue to call the attention of your readers to the fact that at Brixton Hall, on Tuesday, the 21st inst., at eight p.m., Mr. A. Ernest Smith, F.R.P.S. (Chief of the Autogravure Department of the Autotype Company, and winner of the Society of Arts' Prize recently offered for photogravure), will

lecture and demonstrate that process, and that we shall, on that occasion, be very pleased to have the company of any one interested."

* * *

We are very pleased to give prominence to the announcement of Mr. A. Ernest Smith's lecture. He is a master of the beautiful process of photogravure, and we hope that he and the Brixton and Clapham Camera Club will, on the 21st, be rewarded by a good attendance.

* * *

Messrs. A. B. Fleming & Co., of Caroline-park, Edinburgh, send us a copy of the picture, *Vanity Fair*, painted by S. Melton Fisher, and recently exhibited at the Royal Academy. For the benefit of those of our readers who do not know what phase of Vanity Fair the artist has chosen to treat, we may say that he has gone to a high-class drapery establishment, and caught a group of ladies in the act of selecting dress materials, &c. The opportunities such a subject affords for colour effects are obvious.

* * *

Of the reproduction to hand, Messrs. Fleming say that, with all its variety of colours, it was reproduced in three workings—yellow, red and blue—with inks of Messrs. Fleming's manufacture. The blocks were supplied by the Heliochrome Company, 122, Elgin-crescent, Notting Hill. It is a capital bit of work all through. Three-colour printing is gradually passing the obstacles that have so long barred its progress, and we may surely anticipate for it, in the near future, a very wide vogue.

* * *

A triumph of the art of reviewing appears in the *Daily Chronicle* of Friday last. Seventeen books on photography are "reviewed" in thirty-two lines. We give the "review" in full, because it may be instrumental in preventing some photographic publishers from again troubling the *Chronicle* to make its reviews of books on photography the opportunity for printing such confessions of photographic ignorance as the following:—

* * *

"This formidable array of books upon photography—nearly all of which are to be had at trifling cost—is but a portion of those which have been published during the last six months. Apparently, in photography, everything can be learnt from books, and therefore, if there is any photographic question which our readers desire to have solved, we recommend them to the appropriate volume in the above list. No doubt the books are most learned. For example, the first, on *Photogravure*, is, from the photographic standpoint, very well done indeed. The *Dictionary*, by Mr. Wall, is complete and up to date. We suppose there is text somewhere in Mr. Sturmey's *Annual*, there are hundreds of advertisements and a large number of illustrations. In fact many of these books, it seems to us, are published simply for the display of process blocks. Works like Captain Abney's *Platinotype* are scientific treatises, which probably only Captain Abney and one or two other men in the country are qualified to criticise and discuss. The entire collection is useful and valuable to photographers; but it is a collection of technical treatises by men who have made themselves specialists in photography—books to consult and books to study, books for the photographic workshop, but scarcely books to review in a newspaper, hardly books which may be described as literature."

* * *

We have received a letter from Mr. T. Gilbert Bowick, Chairman of the Executive Committee of the British Antarctic Expedition of 1896, appealing for funds to defray the cost of that expedition. Mr. Bowick's address is Royal London Yacht Club, 2, Saville-row, and he would, no doubt, be glad to give further particulars to those requiring them. The expedition is chiefly a scientific one, and, although we are not expressly told so, we assume that photography will play a large part in the observations that are to be taken.

THE INTENSIFICATION OF NEGATIVES AFTER DRYING.—I.

It not unfrequently happens that, after drying a negative and taking a print, it is found to be capable of improvement by means of judicious intensification, or the reverse—reduction; but many photographers are reluctant to meddle with matters as they stand, if a moderately satisfactory result is obtainable, in the belief that, after drying, the film is less amenable to successful treatment. To some slight extent this is actually the case, but, by suitable preparation, almost any film, after once drying, may be brought into a perfectly fit condition for the application of the usual methods of treatment. Naturally the means adopted will differ according to the character of the films, gelatine requiring totally different treatment from collodion, and a bath plate from one prepared from collodion emulsion.

We say that almost any film may be so treated, and practically it may be that all are susceptible of being brought into proper condition, though occasionally, under very abnormal circumstances, instances may be met with which refuse to give way to the ordinary processes. For instance, we have more than once met with gelatine negatives which, from some peculiarity in the character of the gelatine employed, coupled, no doubt, with the action thereon of the alum bath, have proved utterly beyond the reach of any form of intensifier or reducer, after they have been some time dried; and, in cases where chrome alum was used after development, we have known the films to refuse to fix, so thoroughly had the gelatine been hardened. Again, many years ago, when on a holiday tour, with collodion dry plates, in order to save trouble while away from home, the negatives developed were simply washed and dried without fixing, that operation being left until our return; but, after drying, it was found that the collodion was of so "horny" a character that it had become quite impervious, not only to aqueous solutions, but also resisted the penetrating action of alcohol, and in this case also the films refused to fix, although those treated immediately after development gave no trouble whatever. These and similar abnormal cases may, however, be left out of consideration.

In a general way, with gelatine plates, no special treatment will be required beyond a thorough soaking in water, but, before any absolutely uniform and complete action can be expected, the entire thickness of the film must be permeated. It is not of the slightest use to just moisten the surface of the plate before applying the intensifying or reducing liquids, as

this is only tantamount to courting failure; the film must be submitted to the action of clean, *soft* water, until the latter has soaked completely through the whole thickness and brought it to an even degree of saturation. The length of soaking necessary to bring about this result will vary according to circumstances, the character of the gelatine, the development used, and whether or not alum has been used in the process. Some plates will, in fact, require ten times the amount of soaking to bring them into suitable condition that others do, and, without knowing the plates, it is difficult to judge at sight when the proper stage has been reached. Generally speaking, those which appear to repel the water and to become quickly surface-dry may be set down as requiring a lengthy soaking, and this will usually be found to be the condition of plates that have remained a long time in the dry state, especially if alum has been applied to them before drying. Those, on the other hand, that take the water readily, and after a minute or so allow it to flow smoothly over the surface, will be ready for treatment after a comparatively short soaking; but, as there is no satisfactory method by which the exact minimum time can be ascertained, it is as well to allow plenty in all cases.

If it should occur, in spite of very prolonged soaking, that irregularity of action follows, it is pretty sure evidence that alum has been largely employed, either in the processs of manufacture of the gelatine or the films or in development, and steps will have to be taken to counteract its hardening action and to restore the permeability of the film. For this purpose nothing surpasses a weak solution of acetic acid, one part of the acid to one hundred of water, in which the plate should be soaked instead of in plain water. After the use of this bath the film should be further soaked in plain water to remove the acid, more especially if the subsequent treatment is to consist of reductiou by means of hypo and ferridcyanide of potassium. A weak solution of ammonia or other alkali is also found to exercise a softening action, but this has also a tendency to rot the gelatine, which the acetic acid does not. The alkali must be thoroughly removed before applying such solutions as mercuric chloride, and in fact, wherever it is possible to dispense with either acid or alkali, it is preferable.

Salaries.—A lawsuit was reported in our last which was, no doubt, read with interest by many operators. It will be remembered that reference has been made in these columns several times during the last few months to the salaries offered by some photographers for skilled operators; also that there was considerable correspondence with regard to an advertisement for a skilled operator or retoucher. The salary offered in that case was twelve shillings a week, with board and lodging, for seven days' work, and it was alleged that there were several applicants for the berth. In another instance twenty-one shillings a week was offered for an "operator and all-round hand." However, the case reported last week shows that good houses still pay good salaries for competent operators. The plaintiff's engagement was for a term, and the salary the first year was five guineas, for the second five and a half, and for the third and following ones six guineas. This is quite refreshing reading after so much has been said about starvation wages of late.

Grinding the Edges of Glass.—In connexion with the method (see next page) of cleaning off old negatives, it occurs to us to remark that those who have worked with plates, with ground or smooth edges, will never regret the small amount of trouble involved in securing that comfort. All that is necessary is, when cleaning the plates, to have at hand a piece of ordinary flag stone, or one of the square-shaped scythe stones. Or, better than either, if one of the old-fashioned stone kitchen sinks be available, the process of cleaning may be carried out with the greatest comfort, and the sink itself will serve the purpose of grindstone. Take each plate singly, as cleaned, and pass each of the eight edges firmly, but lightly, once or twice across the grindstone. If lightly done, the sharp edge of the glass will be removed without causing any roughness; but, if any great force be applied, splinters and chips will be taken out, and a most unsightly edge formed. The time occupied (a few seconds), for each plate, is more than compensated for by the subsequent comfort in working.

Ladies' Nights at Societies.—The Bradford Photographic Society is to be congratulated on the success of its recent innovation—a Ladies' and Children's Night—which will now, doubtless, be repeated annually. In every society where these gatherings have been introduced they have proved the most popular nights of the year, even in societies and clubs where ladies are not eligible for membership. The old South London Society was the first, we think, to inaugurate these annual gatherings with lantern and music. For many years the Photographic Club has made a feature of its Ladies' Nights, and for a few years past it has had an extra night specially for children, when suitable amusements, sweets, &c., were provided for the youngsters. The London and Provincial have also had their Ladies' Nights. Other societies have them too, and in all they prove the most enjoyable nights of the year. Those societies that have not yet instituted an annual Ladies' Night on the lines of those referred to will do well to consider the matter before the lantern season is over; they will find that such entertainments will materially add to their popularity.

Photographs of Dark Flashes of Lightning.—This phenomenon, described by more than one experimenter, has always been looked upon with a questioning spirit; but of the reality of the appearance, whatever its cause, there can be no doubt. At a recent meeting of the Berlin Meteorological Society, Mr. Archenhold exhibited a negative showing this effect, the view having been taken last August. There was visible in the plate one narrow black flash on the dark field of the heavens above the brightly illuminated tree tops, and a second, much broader, bright flash, which was brighter than the tree tops. The opinion was expressed that probably the great intensity of the multiple flash may have led to the solarisation of its own image. It appears to us that a not unlikely explanation of the phenomenon would be that the intensely luminous image of the true flash would appear as a dark flash through reversal of the image, and that the actual image as thrown on the film may have been reflected from the back of the glass upon an adjacent part of the film, and become so reduced in luminosity as to give a developable image.

Abnormal Height of the Barometer.—The high readings of the barometer, during the greater part of last week, were very exceptional throughout England. On Thursday the highest reading reported to the Meteorological Office was at Ardossan, 31·09, which is an inch and quarter above the normal. It is said to be about the highest reading ever recorded in the British Isles. In London, on Friday, the mercury reached 30·92 inches, and it is stated that there have been only three occasions within the last hundred and twenty years, when the reading has exceeded 30·9 inches in the metropolis. The Meteorological Office have just made some modifications in the mean values published with the daily weather reports. The monthly means of the barometer and temperature are now given for the last twenty-five years. The new values show that in January the highest average of the barometer is at Jersey, where the mean is 30·01 inches, and the lowest in the north of Scotland, Sumburgh Head, 29·68 inches. What will perhaps interest photographers just now is the average of sunshine. It appears that the maximum is in Jersey, where, in January, it is seventy-one hours, and the minimum in London, where it is but twenty-six hours.

Photography and Chronographic Measurements.—A note on this subject, from a lecture by Mr. Frederick J. Smith, appears in a recent number of *Nature*. In order to avoid the error of "time-lag," introduced by the use of magnetic and solenoidal arrangements, he has devised a method based entirely on the use of light. Two sources of light at a suitable distance apart throw two beams of light on to a sensitive plate, carried in the carriage of a tram chronograph. By means of lenses the beams of light are caused to form two sharp images on the plate in a vertical line, one above the other, a tuning fork trace is also made on the plate; if the plate traverses when the beams of light are not interrupted, on development two black parallel lines appear on the plate; but, if during the passage of the plate the beams of light are cut by any solid object which shuts off the light, then, on development, two gaps are seen to exist. The distance between these markings, when interpreted in terms of the fork trace, gives the velocity of the object which cuts through the beam of light. In another method, the projectile cut during its flight through two thin screens, placed in the paths of the beams, and so opened a passage for the light. Two parallel lines are then formed on the plate, one longer than the other; the difference in their lengths duly interpreted gives the velocity of the projectile. This new mode of registering velocities would seem to be very valuable, as the most exact determination of the rapidity of the flight of projectiles at various stages is of great importance in artillery investigations.

The Solar Eclipse.—The eclipse of the sun which takes place in August next is already receiving attention at the hands of the joint Royal and Astronomical Societies' Permanent Committee. One of the tracks of the shadow, which is given as good for observations, is across Norway, Sweden, and Lapland, &c., a good station being at Vadso; it is where the English observers will be located. Photography, as a matter of course, will be an important feature of the expedition, and some new apparatus has been specially designed for the work. It is stated that Dr. Common will accompany the expedition, and will take photographs of certain parts of the corona, with a specially long-focus lens or mirror, with a view to settling some disputed points in connexion with it.

The coming eclipse has great attractions for the general public, inasmuch as the Vadso Station, where the English observers will be located, is easily comeatable, and the scenery on the way is very beautiful. We understand that Messrs. Gaze & Son have chartered a steamer of over 3000 tons, fitted with saloon and passenger berths, for a special cruise in connexion with the event. The vessel is timed to reach its destination some days before the eclipse occurs. The intervening time will be easily filled up by geologists, botanists, photographers, and excursionists generally in various ways. Conveniences for photographers on board the *Norse King* will not be overlooked, and some of the most picturesque places in Scandinavia will be visited during the cruise. This excursion will, doubtless, be duly appreciated by those photographers who desire an enjoyable trip to those northern lands, and can avail themselves of the opportunity.

The Great Photographic Discovery.—The extraordinary proportions given to the new discovery, as alluded to in our last, have now dwindled down to such an extent that we are able to give the subject close inspection. There is great probability that a discovery of importance has been made, to the effect that the radiations from a Crookes tube are not arrested by ordinary light-obstructors, but are capable of passing through so-called opaque objects, and exercising photographic action after their passage. If this simple effect prove to be obtainable, there are undoubtedly large possibilities in the future in connexion with such action. It will be remembered that the first announcement suggested the possibility of taking a photograph of the skeleton of a body clothed with its own integuments and surrounded by a textile fabric. Later accounts state, with regard to this idea, that "it is perhaps not strictly a photograph in the ordinary sense, because no lenses are used; it is not a negative, but a positive plate that is obtained." Except as showing that there's no photographic image, this sentence is devoid of meaning.

Professor Klupathy, of the Physical Institute of the University of Pesth, has repeated, "with very satisfactory results," Professor Röntgen's experiments. "The experiments in Vienna" (we quote from the *Standard*, which contained the first announcement of the discovery) "have not been successful up to the present," but Professor Röntgen has "sent rays of the new chemical light through aluminium plates of one and a half centimetre in thickness, and they went as clean through as if the substance had been wood," we learn; but it must be pointed out that camera-makers are inclined to look upon a much smaller thickness than that as being completely resistant to the entry of any hitherto-tried radiations.

A letter over the signature of A. A. C. Swinton, in that paper, states that, in conjunction with Mr. J. C. M. Stanton, the writer has been making experiments in the new direction, and further, that "in confirmation of Professor Röntgen's discovery, we have obtained distinct proof that the radiations in question do pass easily through various substances that are quite opaque to ordinary light, and do produce strong impressions upon ordinary photographic plates entirely encased in light-proof material. Indeed, all substances that we have so far experimented on in this laboratory appear to be transparent to their radiations, even sheets of ebonite, carbon, vulcanised fibre, copper aluminium, and iron." These excerpts would appear to be quite sufficient to show that we have a real discovery, the actual magnitude of which cannot at present be gauged.

Utilising Old Negatives.—There are many purposes to which old negative glass can be applied both by professionals and amateurs, but the trouble presents itself of getting it clean when wanted; consequently, old negatives, as a rule, are a "drug in the market." Yet, the process of cleaning, if undertaken systematically, is simple and easy in the extreme, and a few hours at this season of the year, when no other work presents itself, will provide a supply of clean glass for transparencies, for squeegeeing prints or for general purposes that will last until winter comes round again. If the negatives have been in use for printing purposes, their backs will be already clean, and the other surface, when stripped of its film of gelatine in the manner to be described, will scarcely require any further treatment, beyond rinsing in clean water to render it fit for recoating. The trouble is, in fact, less than with new glass.

Commence by marking, with a writing diamond or sharp file, one corner of the back or reverse side of each plate, so that, after stripping, the better surface may be recognisable, for, in addition to its being cleaner, the coated side will be freer from scratches than the other. Have the plates to be cleaned in a pile, and provide a dish capable of holding three or four at once, and also a bowl of clean cold water. Pour into the dish a sufficient quantity of saturated solution of alum, to each half-pint of which two ounces of ordinary hydrochloric acid, or spirits of salts, have been added. Immerse the plates one by one in the acid solution, and in about a minute's time the film will be loosened; take it out of the acid, rinse it lightly in clean water to avoid the action of the acid on the fingers as far as possible, and then, commencing at one corner, detach the film with a rubbing, rolling motion of the finger, and the whole will come away in a few seconds, leaving the surface of the glass perfectly clean. The acid alone will detach the film, but, at the same time, make it so rotten that it will break, and cause much trouble in removal, especially if the immersion in the acid is too long. The alum, by hardening the gelatine, prevents this, and the plates may be left to soak, two or three at a time, while another is being stripped. When stripped, transfer to a bowl or vessel of clean water, and leave to soak until a number are ready for drying; then dip singly into hot water, and dry with a soft cloth.

Perhaps preferably to drying the plates right off—at least when they are required for recoating, either with collodion or gelatine, a substratum may be applied to the glass after draining, and thus the trouble and time occupied in drying saved. If intended for use with collodion, no better substratum can be used than dilute albumen, made in the following manner:—Take the white of one egg and separate it from the yoke, add to it two or three ounces of water, and *stir, not beat*, vigorously but slowly, until the albumen is thoroughly mixed with the water; to that add, little by little, more water, thoroughly mixing it as added, until the quantity measures from thirty to forty ounces—the exact strength is immaterial between those limits—and a few drops of pure carbolic acid solution. Finally filter, and the substratum is ready for use, and can be flowed over the glass, wet or dry, nearly as easily as collodion. The only trouble will be to avoid bubbles, for which reason it will be well to pour from one vessel, and back into the filter. The substratum for plates to be coated with gelatine emulsion consists of a weak solution of gelatine and chrome alum; or, for that purpose, the glass may be dried without substratum.

JOTTINGS.

NATURALLY, my first act in commencing these "Jottings" for the year, is to tender my congratulations to the new Editor of the JOURNAL. I refrain, however, from saying anything of a commendatory or complimentary nature, for the simple reason that his reputation as a remorseless wielder of the blue pencil is such that it is extremely improbable he would "pass" my remarks. Hence, having humbly made my addition to the congratulatory chorus, I proceed to express the hope that I shall get on as well with the new Chief as I did with his predecessor, that the JOURNAL under his sway will advance and flourish, and that he himself will, to quote the remark of the funny uncle at the dinner party, "be a credit to his bringings-up and an ornament to his fire stove!"

The year that has just opened has witnessed the reshuffling of the cards of the game of life as played by millions in Europe, Africa, Asia, and America—in nearly the whole of the habitable globe, in fact, and the spirit of change and revolution that is abroad in the larger world has also projected its influence into our own small domain of photography. The photographic press and its *personnel* have been subjected to alterations and possibly improvement; gelatine is surely and certainly displacing wet collodion for process negatives; anastigmatic flat-fielded lenses are coming into general use so rapidly that the time cannot be far distant when they will be almost exclusively listed in opticians' catalogues; three-colour work seems commercially practicable; half-tone is sweeping all before it in illustration processes; rumours of the supersession of typography by photography are in the air; and the young bloods of the Royal Photographic Society have risen in revolt against the benevolent but elderly members of its Council, who have so long and creditably assisted in the management of the Society. Is it not all—particularly the last-named anarchical outbreak—enough to take one's breath away?

As regards the immediate future of the Royal Photographic Society, Captain Abney will, doubtless, be re-elected President, and, under all the circumstances of the case, the members could not make a better choice. It will not, I hope, have been forgotten that three years ago, after twelve months' office, he was personally desirous of not continuing as President; but the old ship had not got out of the shallows into which it had drifted a year before, and he therefore stuck to it for another term. If all I hear be true, the re-election of Captain Abney as President on the 11th of next month is the one thing that will prevent a very unpleasant split from occurring in the ranks of the Society.

The removal, temporarily or for good, of some half-dozen old members of Council must necessarily let in a corresponding number of more or less new and untried men, who, it is to be hoped, will form efficient substitutes for the men they displace. But, besides seeming to me callous and ungrateful to throw over an old servant mainly because he *is* old, and *has* served his constituents so well that they have been content to re-elect him year after year, the proceeding is possibly not unattended by grave risks. New blood, or too much of it, is apt to be impetuous and headstrong, and to light-heartedly engage in undertakings which men of mature years and judgment would not. The presence of age and experience on a deliberative or administrative Committee is not to be derided. Without some such steadying agency, the new Council of the Royal may get up to all sorts of tricks, such as the conferment of the Honorary Fellowship on Mr. H. P. Robinson, Mr. A. Maskell, or Mr. G. Davison; the admission of the Linked Ring to Affiliation; the bestowal of the Progress Medal on Dr. Burton Coxe; the increase of the Assistant Secretary's salary to 1000*l.* a year; and so on.

"Stranded," on page 15, asks a question that nobody has troubled to answer. He wants to know when a man is too old to be a photographer. Of course there is no hard-and-fast line to be drawn. "Stranded," however, appears to be considered too old at forty-six. Why, at forty-six a man is usually said to be in the prime of his life and powers. It is a hard lot. I should have been inclined to regard "Stranded's" experience as very exceptional but that so many bitter cases in which the question of age has been of paramount importance have lately come under my notice. Does professional photography, then, rank with drapers' shops, counting-houses, and similar walks of life, that desiderate what is called a good appearance, which means comparative youth, good clothes, and an Adonis-like bearing? Is a painter, a journalist, an author, a politician, a clergyman, a lawyer, an engineer, "too old" at forty-six?

A writer in a monthly contemporary, who signs "Major Kone,' commits himself to several statements with regard to this JOURNAL, and those connected with it, which are neither in good taste nor accurate. He says he has been a reader of the JOURNAL ever since it started, that is, over forty years ago, and this should, although it does not, prove "Major Kone" to be old enough to know better than to occupy his time in disseminating fantastic and impertinent tittle-tattle about things of which he obviously possesses such knowledge as could only have been derived from the exercise of a disordered imagination on the groundwork of a dull and exiguous comprehension. But the writer is obviously not so "old" as he tries to make himself out to be. He says he buys his JOURNAL at the bookstall every Thursday morning. It is not seen on bookstalls on Thursday mornings—a fact which, of course, is immaterial to "Major Kone," whose other efforts to disguise his identity are not less clumsy and unsuccessful.

COSMOS.

CATHODIC PHOTOGRAPHY.

THE report, to which reference was made on page 26 of the last issue, and which originated in Vienna, is of such a nature as to astonish even old hands at photography; but, on careful examination, it will be seen that there is rather more in it than meets the eye at first sight.

It is, of course, well known that the haloid salts of silver are not only sensitive to light, but that invisible images capable of being developed are produced by pressure, by electricity, and by various chemicals, such, for instance, as the hypophosphites.

The following extract from Guillemin's *Electricity and Magnetism* page 371, edited by Professor Sylvanus Thompson, is not without interest or bearing upon this subject, as, at least, leading to considerable speculation as to whether these last experiments of Professor Röntgen do not support the theory that the action of light on the silver haloid is not rather photo-electrical than photo-chemical. In speaking of Faraday's discovery of the magnetic power of magnets on light, it is stated that Clerk Maxwell deduced the theory "that light itself is simply an electro-magnetic phenomenon; that which we call waves of light are not mechanical waves at all, but are immensely rapid electric displacements taking place in the all-per-

vading ether of space. . . . . It is believed by the editor of this work that this theory, which is now in the main accepted by all the younger generation of physicists, will be able, with proper modification and development, to explain the curious relation existing between electricity and the phosphorescent, fluorescent, and chemical properties of light."

Crookes, in his presidential address to the British Association in 1886, drew attention to an extremely graphic illustration of the grouping of the elements according to the periodic law, and, roughly speaking, this might be likened to a pendulum with ever-decreasing amplitude, and at various points the elements fall into line, being respectively electro-negative and electro-positive. Thus the four haloids, chlorine, bromine, iodine, and fluorine, are electro-negative, whilst silver is electro-positive. This being the case, then, might it not happen that, accepting the electro-magnetic theory of light as enunciated above, a film of silver haloid may be so affected by the electric displacement called light as to be disassociated? Minchin and Waterhouse have proved the passages of a current of electricity when light falls on a film of silver salts, and Mr. Bolas, in his affiliation lecture, suggested that the developer might merely close an electric circuit.

It is unnecessary to explain what is meant by "cathodic," as most photographers will be aware of the so-called Crookes' radiant matter in vacuum or quasi-vacuum tubes. That the rays thus proceeding from the cathode are capable of exciting phosphorescence is proved by a paper upon this subject, which will be found in Eder's *Jahrbuch*, 1894, p. 204, by Ebert and Wiedemann. In the volume for 1895, p. 47, Ebert describes the most economical light, which consists of a compressed pellet of phosphorescent material enclosed in a glass tube, on the outside of which two tinfoil rings are cemented, and to which are connected the wires from the electrical machine; the cathodic rays cause the phosphorescent substance to shine with a total consumption of work or energy about two thousand times less than that required to maintain the normal amyl-acetate lamp. It will be remembered that, in the lectures delivered by Mr. Bolas in connexion with the affiliated societies, he sketched some such light as this as the light of the future.

These cathodic rays were first of all studied, so far as I can find, by Hittorf (*Wiedemann's Annalen*, xxxi.), but their action was studied photographically by M. Leuard, and a paper on the subject appeared in *La Nature*, July 28, 1894, p. 131. The method of obtaining them was to cement the cathode to one end of a tube of glass, the anode taking the form of a hollow brass cylinder applied to the sides, these being connected with an induction coil or Wimshurst machine. The rays are not directly visible, except in a vacuum or partial vacuum, and the absorbent power of gases for these rays increases with their density; they can also traverse thin sheets of metal and thick paper, wood, and many organic substances, but a sheet of quartz, ·5 mm. thick, immediately arrests them. In the article above cited are reproductions of photographs obtained by these rays, or possibly, what might be a better name for them, shadowgraphs, because it is obvious that, if metallic substances are opaque to these rays, whilst organic substances are transparent or permeable, the resulting photographs must be mere silhouette outlines, unless the rays form a penumbral shadow which might be reflected from the details of the surface of the metallic object. M. Leuard's experiments seem to prove that there are not perfect geometric shadows, but faint diffraction fringes, or penumbra.

There are many photographers, doubtless, who have access to instruments which will enable them to repeat Prof. Röntgen's experiments, and also many who are capable of explaining the phenomena, and whether they are directly or indirectly connected with the Hertzian waves.

E. J. WALL.

PHOTOGRAPHIC WORKERS AT WORK.

I.—How Messrs. Newman & Guardia make a Hand Camera.

The letters "N. & G." on hand cameras and changing boxes are getting to be as well known amongst photographers as the figures "97," on an article not entirely unconnected with boots, are to the average domesticated specimen of the genus *homo*—and they convey to an outsider about as much meaning. To those interested in the subject, however, "N. & G." imply that the article upon which they are inscribed is as we need not tell our readers, the product of Messrs. Newman & Guardia; that it was made at their factory in the north of London, and reached the market through the establishment of the firm in Shaftesbury-avenue; and that, both as regards design and workmanship, it may be relied upon as being among the best.

It was with no small amount of interest, in seeing how the "N. & G." cameras came into existence, that we mounted to the top story of a large building in the neighbourhood of Kentish Town, noting on our way up that the firm had at least ample room for expansion downwards in the shape of two or three spacious and well-lit workshops. Arrived at the summit, we soon found ourselves in the glass-sided office from which Mr. Newman, the member of the firm who has charge of the works, is able to survey in the immediate foreground or in the far distance the whole of the factory.

Adjoining the office are the stores, in which are to be found not only the raw materials from which the cameras are made, but large numbers of the finished parts of all kinds ready to be made up into cameras and changing boxes as occasion demands. Here also is performed the little clerical work occasioned by the factory itself, the business transactions being carried on from the offices in Shaftesbury-avenue, under the superintendence of Mr. J. Guardia, the other half of the firm. Before leaving the office, to have the question at the head of this article answered in the most satisfactory way possible, Mr. Newman points out the collection of gauges and templates, without which such work as is carried on here would be impossible.

"If you get an order from abroad, say, for a changing box to fit one of your cameras, when it got out there and did not fit, you would hear of it?" we suggested.

"We should not hear of it." "It would fit," was the reply; "and this is how such a fit is secured. (Reaching down a substantial metal block and a hollow box of similar material.) Every changing box before it leaves the premises has to fit in that gauge" (pointing to the box), "and every camera has to be so made as to take this block," which we then noticed to be a dummy changing-box. "The two gauges are so adjusted as to ensure that, when this has been done, any changing box will fit any of our cameras made for that size of plate, so that such a *contretemps* is, as you see, absolutely prevented." In addition to these, there are hanging on the office walls, hundreds of templates, showing the exact sizes of the various parts to ensure proper fitting and accurate work.

"No piece work here," says Mr. Newman, "but we are able to see that we get our money's worth without it. Here! look at these parts;" and, so saying, he shows us a box of brass fittings (we were now in the stores), referring to a ticket, "they cost eightpence-halfpenny each the last time they were made, and, if the next man to do any runs the cost up, we shall soon guess that something is wrong, and he will hear of it."

The woodworking department was that part of the factory which first demanded attention. Here were to be seen camera cases and changing boxes in various stages of completion, from the mahogany, ebony, and pear-tree wood in the rough—these are the only woods employed in their products by Messrs. Newman & Guardia—to the finished article. It was here that we learned that the box portions of the changing boxes, like the Siamese twins, passed the earlier stages of their existence in pairs linked closely together, a surgical operation being required subsequently to separate each into two distinct boxes. Here also we learnt that, in addition to being carefully fitted together and glued, every camera case contains over a gross of screws. "It must add something to the weight," admits Mr. Newman; "but they are all the stronger for it."

Passing by the gas engine which provides, in an unobtrusive manner, the motive power for the machinery, we notice up near the roof an hexagonal box revolving by means of a band, and apparently unconnected with any of the many tools near it. On inquiry we learn that it is a "rumble," though that does not enlighten us much, until it is explained that little German silver or brass fittings after they leave the machine are placed in this box along with some polishing material, and revolved quietly for a period which apparently might be anything from a week to three months. "It just takes the extreme sharpness off the edges and gives them that nice soft feel."

In the general shop are to be seen the various metal parts in course of production, cameras being put together, shutters made, and the other incidental work of manufacture carried on. That this last item is not an altogether unimportant one is shown by the large quantity of special tools for making the various fittings, tools in a large measure designed and made on the premises. Under this head would be included dies for stamping sheet metal, tools for cutting toothed wheels, for bending and shaping plate sheaths, and so on—too numerous to mention, and occupying a considerable space both on the shop floor and, the smaller

articles these, in cupboards. The fact that the hands were employed on work where quality and not quantity was the motto was here very conspicuous. Every one seemed busy, and yet not too busy to be working *well*. Shutters, of course, occupied a consider share of attention, since these, especially of very high speed and those involving pneumatic regulation, are among the firm's specialities.

The exhibition of a shutter working in the five-hundredth part of a second starts Mr. Newman off on a dissertation on high speeds and how to obtain them, which, in our anxiety for good "copy," we are careful not to interrupt.

"If space," he says "is not a consideration and the shutter can be as large as you like, high speeds can easily be obtained. It is when the entire shutter has to be small enough to go in an ordinary size of hand camera that any difficulty arises. Then, it is not so difficult when the aperture of the lens is not a very large one. But, when the opening has to be, say, an inch and a half or more in diameter, becomes hard, since the two features to strive for, if very high speeds are required, are extreme lightness for the moving part, and the opportunity of letting it get well started before it actually uncovers the lens. You see at once that, the bigger the opening, the harder the fulfilment of these conditions becomes, bearing in mind, at the same time, the efficiency of the shutter. In this (a Celeritas shutter made to give exposures up to the one-five-hundredth part of a second) the speed is got by keeping the rotating disc as light as ever we can, by employing a strong steel spring as the driving power, and by allowing the disc to make one-third of an entire revolution before the actual exposure is given." That the speed of the shutter was actually as high as that given above, we subsequently had an opportunity of ascertaining for ourselves in the shutter-testing apparatus, which is made use of in every case before a shutter leaves the works.

It was in this part of the factory that we realised the difficulties thrown in the way of hand-camera makers by the new types of lens, which, however satisfactory from the user's point of view, have necessitated the expenditure of a large amount of ingenuity by those who aim at making a shutter to work between their lenses. The inner surfaces of the front and back combinations are so near one another, that it is astonishing to the non-mechanical mind that not only an iris diaphragm, but an instantaneous shutter, can be constructed to work between them.

Here, too, we were shown hand cameras to take the new Satz anastigmats, each of which means practically three distinct lenses of different foci; and, when we say that the longest of the three is, for a quarter-plate size, a shade over eleven inches, it will be seen that the camera is required to rack out to a considerable length. Still a design has been brought out which accomplishes this without any undue increase in bulk or weight, and the remarkable capabilities of the lens are so placed at the disposal of the hand-camera worker.

A reference to the clock informs us that we have already trespassed on Mr. Newman's valuable time, for a period which, were we ourselves the sufferers, we should, probably, bitterly resent, but a movement of departure brings forth the remark that "there is one point in all our designs I have not referred to. You will notice here, and here, and here" (suiting the action to the word and pointing out his meaning on a hand camera lying near), "we always endeavour to arrange things so that every working part can, if necessary, be readily got at from the outside, without pulling the camera to pieces." Seeing that we cast envious glances at the instrument in his hands, he incidentally remarks that its price is about eighteen pounds.

"An N. & G. camera is a luxury indeed," say we.

"We hold that for the best possible work it is a necessity," replies Mr. Newman. "That" (pointing to an oubliette-like gap by the side of the staircase, intended one day to accommodate a lift), "that is the shortest way down. Good-bye."

We preferred the longer route by the stairs.

THE PERFECTED PHOTO-CHROMOSCOPE.

At the Camera Club, on Thursday evening last week, Mr. Frederick E. Ives read a paper on the above instrument, upon which he has been working for the last two years. He met with a most hearty welcome from the members, who mustered in such numbers that the large room at the Club was crammed to suffocation, so much so that the electric fan had to be kept at work almost constantly to clear the air. Mr. Ives illustrated his paper with lantern slides, and he also called in to his aid the spectroscope, and the polariscope. And here let it be noted that his experiments were carried out with a neatness and entire absence of mishap, which is far from common even when an expert lecturer is addressing an audience. This perfection of results was, in great measure, due to the form of lantern adopted by Mr. Ives. It is not patented, and the lecturer expressly mentioned this circumstance, telling his audience that any one was at liberty to copy its design. It is a small lantern, employing the electric arc light, with a sliding front, so that the ordinary lantern nozzle, the polariscope, and, say, a projection microscope, can at will, and with only a second's pause, be brought in front of the light. As an example of what can be done by the instrument, we may mention that he showed the spectrum, and at the same time exhibited a piece of coloured glass, in order to illustrate what particular parts of the band of colour were absorbed by the medium. Captain Abney, who occupied the chair, made some exceedingly complimentary remarks concerning this lantern, and indicated that it was the best apparatus of the kind which had yet come under his notice. We will now give a *resumé* of Mr. Ives's paper.

He first of all alluded to a paper which, in 1893, he had read before the Camera Club, in which he described his original photo-chromoscope, an instrument which, while giving fine results, had complications of construction which seriously interfered with its practical use, the necessary cleansing of the mirrors and lenses causing fresh adjustments which could not readily be performed by an unskilled hand. The old instrument, at the same time, compared unfavourably with the one which he had now perfected, for it was monocular, the new one showing a stereoscopic image. The old instrument, he admitted, presented an advance upon previous efforts in the same direction; but the defects to which he had alluded had to be overcome, and the result of his labours was the perfected photo-chromoscope, which would presently be submitted to consideration. The new instrument, he might mention, was so simple that a child could adjust it. The image was viewed by both eyes,

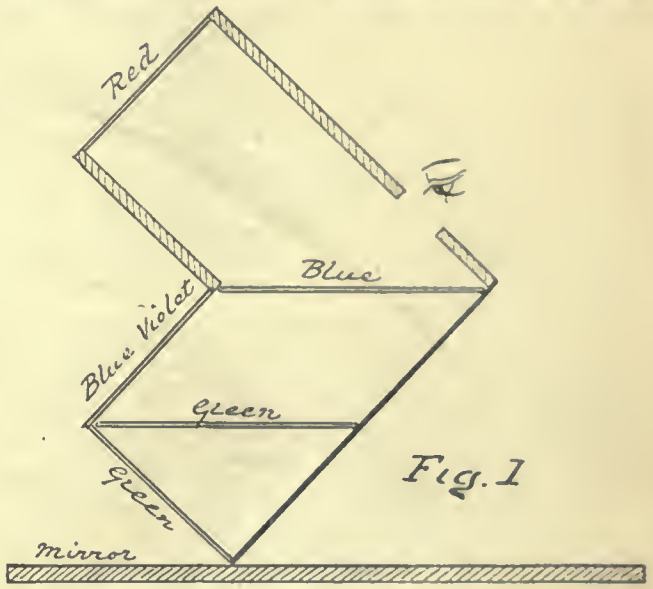


Fig. 1

and it compared very favourably with its prototype, both in simplicity and also in price. It might be described as a box furnished with five pieces of coloured glass, a reflecting mirror, and a pair of lenses (see fig. 1).

In his former paper he had described to the Camera Club the principles upon which the instrument was constructed, and it would be futile before such an audience to talk generally upon the phenomena of light; but, in case there should be present any who were absent on the occasion of his last lecture, he would enter into a few details, and would illustrate his remarks, as far as possible, by lantern slides. Another object which he had in view was to show them some new apparatus which he had devised to illustrate the science of colour, and he thought that this apparatus would be a subject of interest to his auditors.

After alluding to the importance of light as a form of energy upon which all life is dependent, and to the wave motion which is characteristic of it, he showed how white light could be split up into its constituent coloured rays by means of a grating, or by a prism. It was only by experimenting with the spectrum, and by submitting a sensitive plate to the influence of different parts of that spectrum, that we can arrive at the solution of many photographic problems.

After throwing an image of the spectrum upon the lantern screen, the lecturer showed why, in white light, most objects exhibit colour, a red glass showing red because it absorbed, or stopped, nearly all the rays except the red, the same result for green or any other colour being brought about by using glasses of each specific tint. But most of the colours of nature are not so simple as these, pink, for instance, as he would demonstrate, being a mixture of all the colours of the spectrum except the yellow-green. Yellow is another colour which is usually very impure, and, although it was at one time regarded as a primary, the simple experiment he now showed would prove that it is made up of green, orange, yellow, and red. A combination of didymium glass and aniline yellow, which he now placed in the lantern, would prove that it was not

even necessary to have any spectrum yellow present for this particular combination, which was brilliant enough to the eye when analysed by the spectrum, is seen to be made up of red, orange, and green.

Although the colours of nature are due to the specific absorption of part of the spectrum tints, many objects, which, like window glass, will transmit all the spectrum rays, will give exquisite colours when exhibited in thin films, or by means of the polariscope. A ray of light passing through a crystal of Iceland spar becomes divided into two rays, a fact which Mr. Ives illustrated in a beautiful and novel manner by holding such a crystal in front of a lantern slide of a statue, the image on the screen being immediately doubled. He then showed how, by cutting the spar and cementing it together in a particular way, it became a polarising prism, passing only one of the polarised rays. Here, again, came another very neat illustration, a verbal one only, it is true, but so ingenious as to call forth a little murmur of approval. Mr. Ives said that the relation which a ray coming through a polarising prism bears to another polarising prism is like that which exists between a paling and a flat board; turned on edge, the board will pass through easily, but, turn it half way round, and it will be refused admission. By means of two prisms, the passage and stoppage of the light was shown on the screen, and it was also shown that, when some other double refracting substance was introduced between the prisms, the ray is broken up and twisted, so that it will once more find passage.

The light ray having been analysed, the next thing to consider is its photographic action. The older theory was to split up the spectrum into three divisions—heat, light, and actinism—the heat rays mingling with the light ray at the red end, and the actinic rays overlapping the blue and violet at the other end. A great improvement in photography was indicated by the introduction of isochromatic plates, by which the reproach of dark colours being rendered light, and *vice versâ*, which had always attached to photographic pictures, had at last been removed. He now showed a series of pictures which exhibited the colour-sensitising action of certain dyes, the plates having been made some time ago with collodio-bromide emulsion, and he would in each case compare a picture on the dyed plate with one taken on the same description of plate undyed. We thus learn that all the light rays, notwithstanding their colour, possess the property of actinism, and we also see how we can, by the use of specific dyes, suppress the action of any ray not wanted by the interposition of a colour filter. When one has mastered the subject, it becomes a comparatively easy matter to translate all colours into substantially correct monochrome.

It must be remembered, as a most important point, that colour does not depend upon wave-length only, and, although the hues of different parts of the spectrum have their fixed wave-lengths, some of the brightest can be reproduced to the eye by the mixture of other spectrum colours, as already shown in the case of the didydium glass. Indeed, experiment shows that all the colours of the spectrum can be reproduced, as well as white light, by definite mixtures of deep red, green, and blue-violet. The Young-Helmholtz theory assumes that there are three colour sensations in the brain, each being associated with one of these colours, all other colours being the result of compound sensations. Clerk Maxwell made measurements and plotted curves to show in what proportions these fundamental colours were mixed to produce the other tints of the spectrum. Upon these observations and experiments is based the photo-chromoscope.

An object having been chosen for representation in the instrument, three photographs are made of it, each being produced by the joint action of the respective fundamental colour, in its due proportions, and all other hues into which it must enter in the reproduction. The resulting positive image must, however, be viewed by the light of the fundamental colour only. In other words the three necessary photographic negatives are made by mixtures of spectrum colours, but the positives taken from them are associated with approximately pure red, green, and blue-violet screens, and mingled into one image which is projected upon the retina. By this means a true colour record of any object can be obtained, and such records can, at will, be translated into colours in the photo-chromoscope or can be utilised for triple lantern projection.

Mr. Ives then pointed out that for his purpose Maxwell's colour curves required certain modifications, a matter to which he had referred in detail in an article published in the *Photographic Times Annual* for 1885. He had therefore, and at Captain Abney's suggestion, he might say, slightly modified Maxwell's curves for his own use, and some pretty severe tests have shown these modifications to have been justified. To obtain absolute perfect results, from a theoretical point of view, four reproduction colours, violet, blue-green, green, and red are necessary, and when three colours only are used there must be a slight degradation, but he had succeeded in distributing this until it appeared only as a trace of atmosphere, a fault that in London at least could hardly be considered as unnatural.

By lantern projection the results obtained are not so good as by his photo-chromoscope, but, as a means of demonstrating the principles upon which the instrument is based, it is valuable. (The lecturer here showed on the screen three separate chromograms, each covered with its suitable coloured glass. By rotating in turn the prism fixed in each of the three lenses which had now for the purpose been attached to the lantern front, the three images were superposed, with the result that the colours blended in the most beautiful and natural manner to form a perfect picture.) He explained that, in order to show such projections on a large scale, it would be necessary not only to employ three lantern objectives, but an arc light for each; and, that as this arrangement was almost prohibitive on account of its inconvenience and expense, he preferred to limit himself to lantern pictures produced in a way he had shown at the Camera Club two years ago. These were made by combining on one glass three films of different colours. Several of these pictures he now exhibited.

Composite colour photography could have very few practical applications so long as it was necessary to take separate negatives by separate exposures, and to project separate positives on a screen by means of a triple lantern. But he had now designed a camera which is as simple as a Kodak for taking the necessary negatives by one operation, and, when positives were made from such negatives and placed in the photo-chromoscope, the result was wholly satisfying to the eye. Moreover, the work will be well within the powers of the ordinary amateur photographer, and even those who do not care to meddle with camera or lens can have an instrument with chromograms supplied, which will be an endless source of delight to them. It is true that this process does not give a fixed coloured image, such as the world has been looking for so long, but he had indicated by his compound lantern slides how, at least, very satisfactory coloured images could be produced from the photo-chromoscope negatives. For his part, he considered that an image, showing colours and stereoscopic relief, was a far more satisfactory thing to achieve, although the obligation to view the picture in special apparatus might limit its applications.

The photo-chromoscope suggested in its form a flight of steps. In its

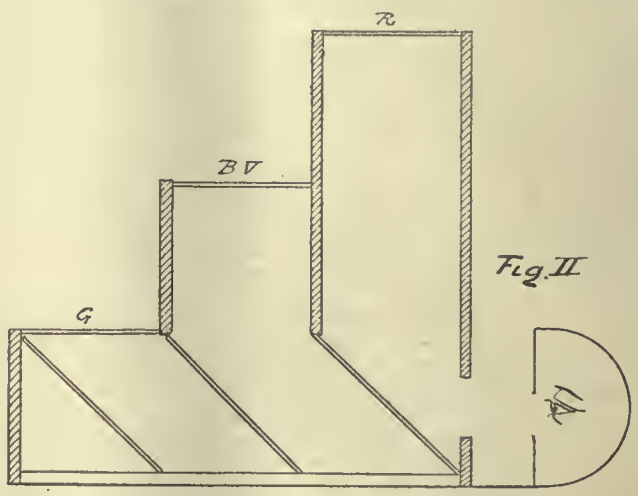


Fig. II.

first model it had three steps as shown in fig. 2, and at the top of each step a chromogram (the three pictures being placed in a hinged frame, see fig. 3, so as to fold over) was placed in association with its proper colour screen. Now, the instrument is made as shown in fig. I, having

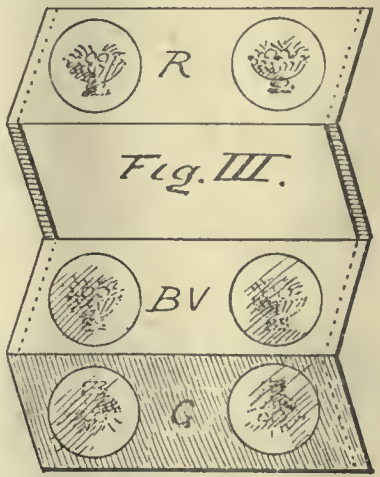


Fig. III.

only two steps, the lowermost image being viewed directly, not by reflection, as in the case of the other two images.

He must protest against the fact that the three-step arrangement has been credited by some of the journals to a German. But he could show that his drawing of this construction appeared as part of his complete patent specification, which he filed in the United States Patent Office,

several months before the German inventor made his claim. Claims have been made by others, but the instruments with which they are credited are incapable, either in fact or theory, of performing the functions of a true photo-chromoscope.

THE PHOTOGRAPHIC COPYRIGHT UNION.

"When last I wrote, congratulating the Photographic Copyright Union on the good work it had already accomplished," writes "An Unionist," in the *Photographer's Record*, "and on its sound and satisfactory position, I had no idea that in another short three months it would have made such rapid strides as it has done; for not only has it increased in popularity, in wealth, and in the number of its members, but it has evinced to the world a liberal and far-seeing policy.

"The Annual General Meeting, held at St. James's Hall on November 22, was well attended, and a great success. Several important modifications were made in the rules, to wit, (*a*) All photographers, whether professional or amateur, who would care to join, are invited to do so; (*b*) the annual subscription of 10*s.* 6*d.* is abolished, and membership now costs absolutely nothing.

"Through the instrumentality of the Union, kindred societies have been established in France and the United States, whilst another one is in course of formation in Germany, so that it may safely be predicted that the Photographic Copyright Union will be an international affair.

"With regard to the correspondence which appeared in the *Times* a few weeks ago, but one opinion can be formed. A certain section of the illustrated press showed its annoyance at having to pay a moderate fee for what, before the formation of the Union, it was in the habit of obtaining for nothing; and its intention was to endeavour to dissuade celebrities from giving free sittings, by which the photographer would be deprived of the copyright therein, and the journalist would accordingly have the benefit, free of cost, of the photographer's skill, labour, and outlay. The movement, however, has missed its purpose; for I am assured by several of the leading men in the photographic world that the intemperate correspondence referred to has not had the slightest influence upon their business. Nay, more, I have no hesitation in asserting that, had these letters had their desired effect, in six months' time not only their inspirers, but also the *respectable* portion of the illustrated press, would have nothing to fill the papers with. And why? Because not one celebrity in fifty would think of sitting for his photograph *unless asked!*

"The future policy of journalists and photographers is to work amicably together to their mutual advantage. Let the journalist submit with a good grace to the inevitable, and pay a small fee for the use of the photographer's productions, which are as much his legal property as anything else can be. But, at the same time, it is to be hoped that no photographer will charge a copyright fee for the use of a photograph which is *not* copyright.

"Before closing this short article, I should like to say a word or two with regard to registering copyright photographs. It has been suggested that I am altogether wrong in the assertions I made in my last article with regard to the existing law; but perhaps I did not explain myself with sufficient clearness. I again affirm that, if a photographer takes a photograph of any person on his own behalf, and without payment from the sitter, from the moment the negative is taken the copyright is the photographer's. Registration or non-registration does not affect the copyright in the least. The photographer may register whenever he pleases, though he cannot avail himself of any statutory remedies until it is registered; but, if a copyright picture is pirated *before* registration, he can subsequently register, when he is entitled to avail himself of all statutory remedies against the reproducer for all copies sold *after* registration.

"In conclusion, I would earnestly urge journalists and photographers to meet each other on honourable, straightforward, and business terms, when I feel sure that there will be an end to grumbling on either side."

THE TRAILL TAYLOR MEMORIAL.

The Executive Committee, appointed at the meeting held on December 20 last, met for the first time on Wednesday, January 8, at the rooms of the Royal Photographic Society. Their first act was to exercise the power given them of adding to their number by inviting Mr. R. Child Bayley to join in their deliberations. After long and careful consideration of the various suggestions that have been made with regard to the form the memorial should take, it was decided unanimously that it should take the form of a lectureship in connexion with photography, and that the lectures should be delivered in London, or in the provinces, according to circumstances, and as the controlling body for the time being might decide.

It was further resolved that the fund should be administered by a Committee to be elected triennially, and to consist of an equal number of London and of country members; the first Committee to be appointed by the General Committee of the fund.

The strongest desire was expressed by the Committee that it should be understood that it was their intention, as far as possible, to provide that the benefits of the fund should be made available for country photographers as well as London ones, and that country photographers should be fairly represented on the governing body.

Until some idea could be formed of the amount of money likely to be subscribed, it was, of course, impossible to discuss details of the application of the funds, but a hope and belief were expressed that the Committee would have a sum of not less than 500*l.* to deal with.

First Subscription List.

	£	s.	d.
The Eastman Materials Co.	12	12	0
Messrs. Perken, Son, & Rayment	10	10	0
,, Elliott & Fry	3	3	0
Mr. Thomas Fall	2	2	0
,, A. Werner	2	2	0
,, A. Pringle	2	2	0
,, F. W. Hindley	2	2	0
,, J. A. Sinclair	2	2	0
Messrs. George Houghton & Sons	1	1	0
Sir H. T. Wood	1	1	0
Mr. H. P. Robinson	1	1	0
,, P. Everitt	1	1	0
,, T. Sebastian Davis	1	1	0
,, T. R. Dallmeyer	1	1	0
,, E. J. Wall	1	1	0
,, Thos. Bedding	1	1	0
,, A. Mackie	1	1	0
,, R. Child Bayley	1	1	0
,, E. W. Parfitt	1	1	0
,, R. P. Drage	1	1	0
,, G. W. Tottem	1	1	0
,, Birt Acres	1	1	0
,, Archer Clarke	1	1	0
,, Walter Tyler	1	1	0
,, F. G. O. Stuart (Southampton)	1	1	0
,, Mr. H. Snowden Ward	1	1	0
Mrs. Catherine Weed Ward	1	1	0
Mr. Frank Miall		10	6
Amounts under 10*s.*	4	15	0
	£61	19	6

PROCESS ENGRAVING AND ITS REMUNERATION.

The Directors of the Electrotypers, Stereotypers, Process and General Engravers' Association, which is registered for the protection and advancement of the interests of the trades embodied in its title, have given much consideration to the serious question of the low prices now ruling for process engraving, both line and half-tone, and, being convinced that unless some united action be taken to check that depreciation the industry will be practically ruined by being rendered unremunerative, they convened a meeting of the trade representatives on Monday afternoon at Anderton's Hotel for the purpose of endeavouring to fix a standard rate, at least as regards minimum prices.

Mr. W. Boutall presided, and pointed out that the meeting had been convened for the purpose of considering any practical scheme for the improvement of the present condition of the process and engraving business, a trade, he observed, which had almost sprung up during the last quarter of a century, and had now assumed considerable magnitude, and had almost become one of the staple trades of the country. It was, however, only in the beginning of last year that they had obtained an organization. The present deplorable condition of the industry was mainly due to the fact that every man had been doing what seemed right in his own eyes, and paying little regard to the surrounding conditions of the industry taken as a whole. The matter of price, however, had been the result, to a large extent, of accidental circumstances, such as the cost of production, wages, materials, and the different charges which went to make up the aggregate of the cost of the work. Many other considerations were also involved which did not apply in the case of an ordinary manufacturing industry. Mr. Boutall pointed out that the process-engraving trade was rather of the nature of an artistic industry, and he considered artistic merit of itself ought to have a very considerable influence not merely upon the result which they produced, but upon the price obtained for it. The industry having advanced very considerably, it had been perfectly legitimate that a certain proportion of the benefit which arose from its importance should have been given to the customer; but it had been represented to them that a very much larger proportion of the benefit had been given to the customer than was ever called for by the circumstances of the case. The Directors, Mr. Boutall observed, had given very careful consideration to the question, and had resolved that the better course was to ask for an expression of outside opinions, so as to obtain some common basis which would afford ground for future operations, and hence the convening of that meeting, which he hoped would result in something practicable being resolved upon.

A spirited discussion then ensued, it being eventually resolved that a ballot should be taken to fix the net minimum prices which should

prevail in the trade as the current prices for line and half-tone proce engraving work, both as to the rate per square inch and also as to the minimum for single blocks. It was further resolved that the meeting should be adjourned, and that the result of the ballot should be made known by the Secretary, Mr. George Holloway, and that the opinions of absent representative firms should be obtained.

The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

PYRO FORMULA (to Mr. E. Dunmore).—E. A. GODWARD says: "In the *Photographers' Companion*, on p. 126, under the heading of Formulæ, the following is given:—

Carbonate of Soda Developers.

A.—Pure carbonate of soda	6 ounces.
Water	80 „
B.—Pyrogallic acid	1 ounce.
Sulphite of soda	6 ounces.
Sulphuric acid	1 drachm.
Water	1 ounce.

For use, equal parts of each.

The bulk of water for the B solution seems entirely out of proportion to A, taking into consideration the fact that equal parts of A and B are to be used. Is there not an error somewhere?"—In reply: The quantity of water in B should, we believe, be 80 ounces.

DEVELOPER FOR MICROPHOTOGRAPHS.—PLATO says: "1. I have been reducing some quarter-plate portraits, and employ an inch power of my microscope, and have got on fairly well, but I find I want a particular developer for the purpose. The one I use is:—

Iron	1 drachm.
Acetic acid	2 drachms.
Spirit	2 „
Water	12 ounces.

When I put these under the microscope, some are very good and sharp, that is, if the developer is stopped at the right moment; if left on a little too long, it appears a little out of focus, but I find it is owing to a slight deposit that takes place, and show it very much with a higher power. Now, can any one tell me of a developer that will be an improvement? I may say that I have tried a pyro developer and find it the same. 2. Will some one please give the formulæ suited for the albumen plates prepared by Dr. Ryley, as mentioned in the ALMANAC? There is no formula for developing given."

ACETYLENE (to Mr. Edwin Banks).—W. THOMPSON writes: "I have for a long time used the Welsbach incandescent light for enlarging, and also two of them in a reducing camera. My gas supply has, however, totally failed me, and I am in a dilemma. Your article on acetylene, of January 3, has made me wonder whether I can instal this as a new source of light; but I would like a sketch of the generator and sizes given. Could you favour me with this or refer me to any source from which I could get it? I am afraid I cannot afford to buy any commercial plant, but am in a position to have anything made. I gather from your article that the light is safe, and the burner you recommend is suited to projection. I would esteem any information as to the form of generator as a very great favour, and it would be of great aid to me."

DYES FOR MORDANTS.—J. C. W. says: "In reference to the article (in December 27 number) on photographic mordants, I should be much obliged if you could give me, in your correspondence column, a few hints as to suitable dyes to use. I have tried some of Judson's dyes which are not supposed to dye cotton, and while some—as for example, the green—leave the cotton white, they do not dye the (chromic) mordant sufficiently, others stain both cotton and image. Either a list of a few dyes or a few general hints would be useful. I cannot find any particulars as to the properties of dyes and mordants in any of the books of reference on which I can lay hand."

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—Photo-mechanical Meeting, Tuesday, January 21, at eight p.m., at 12, Hanover-square, W. *On Irregular-grained Screens*, by Mr. E. Sanger Shepherd.

THE Borough Polytechnic Photographic Society, 103, Borough-road, of which Mr. Alfred Bedding is chairman, only started in November, and now numbers thirty members. An attractive programme for the session has been issued.

IN connexion with the Seventh Annual Eisteddfod, to be held at the Tolmer's Institute, Drummond-street, N.W., on Monday evening, February 3, there will be a photographic competition. Mr. H. Dixon has been chosen as Judge. The competition is open. Particulars may be obtained of Messrs. Gall & Swain, 171, Tufnell Park-road, N.W.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.—The following officers for 1896 were elected at the Annual Meeting held January 9:—*President:* Mr. G. Bankart.—*Vice-President:* Mr. T. W. Gamble.—*Committee:* Messrs. W. J. Coates, W. Murray, J. Porritt, S. Squire.—*Treasurer:* Mr. J. Toone.—*Secretary:* Mr. T. Brown, 68, Church-gate.

GLASGOW "EVENING TIMES" CAMERA CLUB.—The winter Exhibition of this Club will be held in the rooms at 46, Gordon-street, Glasgow. The Exhibition will open on Monday, February 3, and remain open until Saturday, February 29, 1896. The Open Class is: H, Landscape, Seascape, Architecture, set of three, one silver and one bronze medal. In this class there will be an entry fee of 2*s.* 6*d.* for each set of three. Communications respecting the Exhibition should be addressed to the Secretary, Mr. H. C. Shelley, *Evening Times* Camera Club, 46, Gordon-street, Glasgow.

PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, January 22. The meeting will be devoted to *Further Tests with Limelight Jets*, under the direction of Messrs. C. E. Hearson and Andrew Pringle. All jets for trial must be delivered at the Club room by seven o'clock on the 22nd, and must be ticketed with exhibitor's *nom-de-plume* or number, A sealed envelope, containing the exhibitor's name, should accompany the jets. The name of the maker of the successful jet will not be published in the Club report.

WE are glad to hear that no further action has been taken in the matter of the alleged infringement of Dr. Albert's patent, to which we referred last month. The inference is either that the patent is hardly considered of sufficient validity, or the crossing of the lines in the alleged infringing prints was not at the angles claimed by the patent. This latter was the case, but the patent is so wide in claiming for crossings "about 60 or 30 degrees," that, if worth anything at all, it could surely have been made to cover the case in point. The more probable reason is that the plaintiffs in the action did not think it worth while risking a heavy lawsuit.—*Process Work.*

Patent News.

THE following applications for Patents were made between January 1 and 11, 1896:—

PLATE HOLDER.—No. 67. "An Improved Plate-holder or Carrier for Detective and other Photographic Cameras." R. KRÜGENER.

MOUNTING TRANSPARENCIES.—No. 93. "Method of Mounting and Storing Transparent Photographs." J. JOLY.

DEVELOPING BATH AND DIPPER.—No. 150. "An Improved Form of Bath and Dippers for Fixing Photographic Plates." W. TYLAR.

HAND CAMERA.—No. 231. "A Magazine Hand Camera." H. PRADEAU.

PRINTING.—No. 352. "An Improvement in Photographic Printing." E. D. PERCIVAL.

DEVELOPERS.—No. 371. "Improvements in Photographic Developers." Communicated by Lembach & Schleicher. A. M. CLARK.

IMPROVED "METHOD."—No. 450. "An Improved Method in Photography." G. J. BULL and B. F. C. COSTELLOE.

SCREENS.—No. 507. "Improved Screens for use in Photo-mechanical Process Work, and in the Three-colour Process of Photography." J. B. FINDLAY.

CHANGING BACK.—No. 681. "Improvements in Photographic Apparatus for Changing Sensitive Surfaces Arranged as a Pack." J. D. LYSAGHT.

PHOTOGRAPH STAND.—No. 688. "An Improved Stand or Rack for displaying Cards, Photographs, and other Articles." H. C. HALL.

STEREOSCOPES.—No. 700. "An Improvement in Stereoscopes." J. CARPENTER and L. GAUMONT.

CAMERAS.—No. 789. "Improvements in Photographic Cameras." L. HOLMES, L. E. HOLMES, and H. HOLMES.

THE ROYAL PHOTOGRAPHIC SOCIETY'S PROGRESS MEDAL.

We are informed that, at their last meeting, the Council of the Royal Photographic Society unanimoualy awarded Mr. Thomas R. Dallmeyer the progress medal of the Society in recognition of his work in connexion with the tele-photographic lens. We congratulate Mr. Dallmeyer on the distinction of which he has been made the recipient, and are sure it will be universally regarded as having been well deserved and well bestowed.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

January.	Name of Society.	Subject
20	Camera Club	*Exposure and Development.* Captain W. de W. Abney, C.B., R.E.
20	Richmond	*Shutters.* C. W. Harris.
20	South London	Lantern Evening. Prize Slides.
20	Walthamstow	*Lantern Manipulation.* A. Rose.
21	Brixton and Clapham	*Printing Processes of To-day.*—IV. Photogravure. A. E. Smith.
21	Gospel Oak	*Lantern-slide Making.* C. Morris
21	Royal Photographic Society	*On Irregular-grained Screens.* E. Sanger Shepherd
22	Ashton-under-Lyne	Exhibition of Members' Lantern Slides from Views taken on Rambls to Shrawsbury. John Wilson, J.P.
22	Borough Polytechnic	Members' Open Night.
22	Camera Club	Demonstration of the Photo-Antocopyist by the Antocopyist Company.
22	Croydon Camera Club	Practice in Flashlight Work
23	Leytonstone	*My Favourite Developer, and How Used.* A. E. Bailey.
22	Photographic Club	Further Tests with Limelight Jets, under the direction of C. E Hearson and Andrew Pringle, F.R.M.S.
22	Putney	*Perspective and Composition in Pictures —Photographic or otherwise.* W. R. Stretton.
22	Southport	Silver Printing.
23	Bradford	*The Utility of Photography.* Percy Lund.
23	Camera Club	Lantern Evening. Major Lysaght and Mr. Davis.
23	Ireland	*Convention of* 1895. Messrs. Rnthven and Werner.
23	Liverpool Amateur	Lantern in Use.
23	Oldham	*How to Make a Lantern Slide.* W. A. Nash.
23	Woolwich Photo. Society	*The Preparation of Gelatino-chloride and Ptain Salted Papers.* G. H. Moss.
24	Birkenhead Photo. Asso.	*Photo-micrography.* The President.
24	Croydon Microscopical	Demonstration of Toning the Venus Printing-out Papers by Various Methods. C. H. Burnaby Sparrow.

ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 14,—Ordinary Meeting.—Mr. John Spiller, F.I.C., F.C.S., in the chair.

Six applications for membership were received, and thirteen new members were elected.

Mr. H. L. ALDIS, B.A. (Cantab.) read a paper entitled

ASTIGMATISM AND A NEW "STIGMATIC LENS."

The paper commenced with a sketch of the nature of pencils of light showing astigmatism and other aberrations, without special reference to any particular forms of optical systems, and proceeded to deal with the effect in a small incident pencil of the refractions it undergoes in passing through an optical system. Both the primary and secondary curvatures depend in general on the position of the stop, on the distance of the object from the lens, and on the nature of the optical system; but there was this relation between the primary and secondary curvatures of the image that, if from the curvature in the primary plane there were subtracted three times the curvature in the secondary plane, there would be obtained a quantity independent: (1) of the position of the stop; (2) of the distance of the object; and (3) of the thicknesses of the component lenses of the system and of their separations. Sir George Airy, the late Astronomer Royal, proved this result for an optical system, in which the component lenses were indefinitely thin, but apparently did not see that it applied to a system of thick lenses. In consequence of this law, the labour of the construction of lenses on a purely theoretical basis was much lightened, it being only necessary to consider the action of the optical system on the rays of pencils which lie in the primary plane; for instance, in constructing an optical system giving zero curvature in the primary plane, the curvature of the secondary plane could be deduced from the knowledge of the astigmatic constant of the system, and it was one condition of an optical system with a flat field free from astigmatism that the astigmatic constant must vanish. The simplest form of a stigmat lens consisted of a glass plate with parallel plane sides; but, as such a lens had an infinite focal length, it was necessary to modify it in such a way as to obtain a positive focus without altering the astigmatic constant, and the paper then dealt with some lenses exhibiting the principal methods by which the requisite correction was obtained. The question of spherical aberration was next dealt with, and Mr. Aldis concluded by showing a diagram of the first lens he had worked out, and which resembled in general form the type of portrait lens introduced by the late J. H. Dallmeyer in 1866, the chief points of difference being (1) that the back combination was a weak negative lens instead of a positive lens; (2) the refractive indices of the cemented lenses forming the front combination were all high and nearly equal; the back combination was formed of crown-shaped lenses of high refractive index and flint-shaped lenses of low refractive index; and (3) the front lens was an unusually deep meniscus. A diagram and description of the lens is given on page 807 of last year's volume of THE BRITISH JOURNAL OF PHOTOGRAPHY.

A short discussion followed, in which Mr. BECK and Mr. DALLMEYER took part.

Mr. BIRT ACRES then demonstrated an apparatus which he had invented, and to which he had given the name of

THE KINETIC LANTERN,

the object of which was to throw upon the screen a series of photographs in such rapid succession as to convey the idea of natural motion. The photographs shown were taken at the rate of about forty per second, and were projected at the rate of about fifteen per second, the result being similar to that of Edison's kinetoscope. The examples shown included boxers, a review at Kiel by the German Emperor, Epsom Downs and the Derby, serpentine dancing, and breaking waves, and the opinion of the meeting was unmistakably evidenced by the loud applause which greeted the various effects, the sea series in particular being enthusiastically received. Mr. Acres referred to experiments made some time ago in the same direction by Mr Friese Greene, but stated that his own apparatus was of a different nature to Mr. Greene's, and was the outcome of many years' work.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 9,—Mr. J. J. Briginshaw in the chair.

Mr. Percy C. Fox was unanimously elected a member of the Association.

DARK-ROOM ILLUMINATION.

Mr. Bayston passed round two negatives, exposed in three portions, for five, ten, and fifteen minutes respectively, one to a dark-room lamp (having a yellow glass and a thickness of orange paper) at twelve inches distance, and the other to a candle at twelve feet distance, having a piece of card interposed to cut off the direct rays, the reflected light only reaching the plate. The results showed that more fog was present in that exposed to the lamp than that exposed to the candle.

The CHAIRMAN remarked that it had been proved before that one could develop by the light reflected from a wall quite safely. He was in the habit of sheltering the candle with a square sheet of yellow paper when away.

Mr. R. BECKETT, when absent from home, always utilised a candle for changing, placing it in the extreme corner of the room, and in this way had used some of the fastest plates on the market.

BACKING PLATES.

Mr. R. P. DRAGE thought it was high time that plate manufacturers issued them ready backed. It would be a great convenience.

Mr. J. E. HODD said that they were obtainable now. Messrs. B. J. Edwards & Co., and, he thought, Mawson & Swan, issued backed plates, but he did not know the constitution of the backing.

The HON. SECRETARY had used one recommended by Mr. Alexander Cowan, consisting of aurantia in collodion, which was coated in the usual way on the back of the plate. He asked if much expense was attached to the grinding of glass by the sand-blast process commercially, so as to cause a much higher price for plates with a ground-back surface. He referred to the advantages to be obtained in working up a negative. It was suggested that it could be done by hydrofluoric acid, but

Mr. TEAPE thought the action of the acid was uneven, unless the glass was scrupulously clean.

ELEMENTARY EVENINGS.

Mr. J. E. HODD, referring to the scarcity of definite subjects for the meetings, proposed, "That one night a month should be set aside for practical demonstrations on matters concerning photographic practice, embracing more or less elementary matters." He thought it would prove some encouragement for the younger members, who would not get much benefit from the scientific discussions.

Mr. TEAPE was opposed to the idea of setting apart definite evenings for elementary subjects. The shilling handbook supplied all necessaries in this respect.

Mr. R. CHILD BAYLEY thought open evenings were the best, and that a Society like the London and Provincial should not go in for subjects which were amply provided for by the local Societies, of which nearly every member of the London and Provincial were members also.

The HON. SECRETARY thought that the treatment of the subject, even though elementary, greatly affected the question. If treated in the proper way, elementary subjects should not be derogatory to the Association.

Mr. R. BECKETT agreed with Mr. Bayley *re* open evenings, but considered one could have too many of them.

Various amendments were proposed, but, on proceeding to vote, both the proposition and amendment were lost. The immediate result was that some dozen promises of papers or demonstrations were secured by the Secretary.

THE TRAILL TAYLOR MEMORIAL.

The HON. SECRETARY stated that, having failed in obtaining further portraits of the late Mr. Traill Taylor to select from than those already submitted, he proposed that that sent by Mr. Hay Taylor should be accepted. This was agreed to, and a carbon print decided upon by show of hands.

Mr. A. MACKIE drew attention to the fact that, through the death of Mr. Traill Taylor, the Association had lost one of its trustees, and urged that the vacant office be filled at once.

It was proposed by Mr. DRAGE, seconded by Mr. FRESHWATER, and carried, that Mr. A. Haddon be appointed the second Trustee; and, in order to fill the vacancy so formed in the curatorship, Mr. MACKIE proposed, and the HON. SECRETARY seconded, that Mr. Grundy be entrusted with this office. This was carried.

Messrs. HADDON and GRUNDY briefly replied.

It was announced that the Committee appointed to arrange for a suitable memorial to the late Mr. Traill Taylor had decided to institute a lectureship to commemorate his name. The lectures would be delivered either in London or in the provinces, as decided by the management, which would be composed half of London men and half of provincial men. Subscriptions are to be sent to the Hon. Secretary of the Committee, Mr. A. Mackie, 3, Upper Baker-street, N.W.; but the Hon. Secretary of the London and Provincial would collect the subscriptions of its members.

PHOTOGRAPHIC CLUB.

The weekly meeting of the above Club was held at Anderton's Hotel, on Wednesday, January 8, Mr. Frank Haes in the chair. The Judges in

The Watkins' Developing Competition

(Messrs. F. A. Bridge and J. B. B. Wellington) reported that they had awarded the first prize of four guineas to Mr. B. J. Edwards, and the second prize of two guineas to Mr. Ben Edwards for their respective entries. Although upwards of 100 entry forms had been applied for in this competition, the actual competitors amounted to seventeen only. Of this number some had not adhered to the rigid conditions laid down, and many of the competitors had adopted the method of cutting a plate, exposed upon an ordinary landscape subject, in half, and developing the separate moieties. The Judges were of opinion that no fair conclusion could be arrived at from this latter method. The successful entries appear to support the oft-reiterated statement made by practical photographers that an alteration in relative gradation can be effected in the course of development.

Since the last meeting of the Club, Mr. Cowan had measured Messrs. Edwards's negatives in the photometer, and had charted his results. He stated, as the conclusion which he drew from these measurements, that the portion of the plate which had received normal development might be called a perfect negative, that is to say, that the gradations represented the light values as given by exposure. On the other hand, the half of that plate which had been abnormally developed did not appear to be a true negative at all, and he suggested that, owing to the presence of a very large amount of alkali in the developer, there had been a solvent or reducing action upon the sensitive film. That portion of the plate normally developed represented an exceedingly good scale of gradation, and showed that the plate employed had a long period of correct representation. On the other hand, the curve in the abnormally developed plate possessed no portion which could be said to have a period of correct gradation.

Mr. Edwards, in the course of some remarks, expressed his opinion that, if the very rigid conditions laid down by Mr. Watkins had been somewhat modified, he would have been able to demonstrate still better than he had done that gradation could be controlled and altered by development, and he said that he had made exposures varying as much as twenty-four to one, and had from these very widely different exposures produced negatives which he himself could not tell apart, and the prints from which could not be distinguished from one another.

Mr. Alfred Watkins said that the question was so large that no single competition could be expected to produce a conclusive result. His idea had been to compare different developers on fixed lines, and this accounted for what Mr. Edwards had described as "rigid" conditions. His object was to compare one factor at a time, and so he endeavoured to eliminate all considerations of fog and time of development. He hoped that some endeavour would be made to follow up and utilise the information which could be gained by analysing the results of the competition. Were, he asked, the variations which Mr. Edwards had produced due to modification in the use of pyro, bromide, or alkali? His own experiments tended to show that the only factor with which he could produce modifications was the use of bromide. It was with him a question of some bromide or none. He should also like to know if any of the competitors had relied upon tentative development—by which he meant, the adding of further supplies of alkali from time to time during development?

Mr. Sinclair said that the suggestion of a solvent or reducing action of a highly restrained developer, whether due to the presence of a large quantity of bromide or alkali, seemed to him to be a new feature, and to present a field for careful investigation.

Mr. Fry expressed a hope that the Judges would make a written report of the facts as they had found them; he could understand and appreciate the objection to make a statement upon so highly controversial a subject, but he thought that a brief statement of the facts as they found them would be of value.

Mr. Sinclair advocated the point, and the Judges agreed to make a written report.

Mr. Haes said that the photographic world was indebted to Mr. Watkins for his efforts to elucidate the question, and, at his suggestion, the members passed him a very hearty vote of thanks; a similar vote was also passed to the Judges.

Mr. Foxlee showed a model of a camera front, which had been made by Mr. Hare for the late Mr. T. R. Williams. The model, which was perhaps thirty years old, included all the salient features of a new patent camera which had been recently exhibited at the Club, and illustrated the adage that there is nothing new under the sun.

The Infallible Hand Camera.

A member showed McKellen's Infallible hand camera. He explained, by means of a working model of the camera, from which one side of the case had been removed so as to expose the working parts, the simple process by which the plates or films (for either can be used, independently or together) are changed. The act of changing consists in turning a thumb key forward about one full revolution, and then turning the key back to its original position, and until a click can be distinctly heard. The plates or films, which are fitted into sheaths, are made to fall forward by a mechanical device which does not depend upon gravity, and by part of the same device the plates are firmly gripped in position after they have been pushed forward, so that they cannot shake or rattle. An ingenious self-locking door at the bottom of the camera is the means by which the exposed plates can be removed, and an automatic indicator can be fitted to show how many plates have passed. The exposing shutter is of a simple character, and, being made of metal, principally aluminium, appears to be fitted to stand considerable wear and tear. A self-closing shutter is fitted to the lens, which automatically closes when the front of the camera is opened, so that it is impossible to fog or spoil a plate by accident. The Heywood finder, although not an integral part of the camera, can be fitted to it, and is a simple mechanical device without optical complications, by which the precise amount of the view falling upon the plate can be readily ascertained. As the camera has to be raised to the level of the eye to use this finder, photographs taken by its aid represent more truly the actual perspective than do others taken at a lower level altogether. The Infallible hand camera appeared to create a favourable impression upon those who saw it.

MANCHESTER PHOTOGRAPHIC SOCIETY.

January 9,—The President (Mr. H. M. Whitefield) in the chair.

Mr. Brothers drew attention to the recent

Remarkable Development of Photography

in connexion with the discovery of a German professor in photographing by the aid of the light force obtained from an electric current passed through a vacuum tube, whereby certain substances, ordinarily opaque, are rendered practically transparent to the actinic rays, as when overlapping strips of tinfoil were photographed on to a dry plate as if they had been semi-transparent. In another instance, a photograph of a human hand exhibited the actinically opaque skeleton, which was photographed through the flesh of the hand, the flesh only presenting an appearance similar to halation. This discovery is still in an early stage, and much is expected of it when further investigated.

Mr. H. Smith gave a description of his process of

Photo-crayon

for positive prints. He first prepares a gelatino-chloride print by stripping from finely ground glass, which gives a slightly rough surface, and then retouching the print thus obtained as he would retouch a negative, only using coloured crayons kept very sharp. Faber's or Hardtmuth's pencils in cedar were found the best, and can be had in almost any colour. The colouring should be done very lightly with a slight circular motion, being careful not to block the detail, so that the work will form a delicate stipple. A jug is then filled with hot water, and the print is held face downwards over the steam, which will soften the gelatine and make the colours fast, being careful not to steam too much, or it will approach in character to an enamelled print, which is not desirable. The print can be left as it is, or stripped from plain or ground glass or flashed opal by the aid of sheet (bon-bon) gelatine, which is cut a little smaller than the print, soaked in water, and laid on the plate; the print is then placed in contact, and all air bubbles forced out; it is backed with stiff paper, and, when quite dry, stripped and mounted in any suitable manner. Mr. Smith showed some flower studies by this method, the prints having the appearance of delicate water-colour drawings.

Mr. F. Edwards read a paper on his method of

Intensifying Gelatine Dry Plates.

Many photographers have an aversion to intensifying their negatives when too thin to give satisfactory prints, and they try to get over the difficulty by printing in a weak light or through coloured glass. He (Mr. Edwards) never scrupled to strengthen his negatives when necessary, and by these formulæ never had a case of fading, or the negatives altering at all by keeping:—

A.

Perchloride of mercury	50 grains.
Potassium bromide	50 ,,
Water	10 ounces.

B.

Nitrate of silver	50 grains.
Potassium cyanide (pure crys.)	50 ,,
Water	10 ounces.

After the negative has been well washed to free it from hypo, bleach in A, and, after another good washing, proceed to darken in B. Mr. Edwards thought that this bleaching gave a purer white than the plain mercury solution, and solution B gave a good blue-black. In many cases the negative only requires a light intensification, in which case the bleaching need not be carried to any extent; and Mr. Edwards's method is to bleach the negative in the proportion of density required, it being a fallacy to always whiten through to the back of the negative.

Mr. Edwards then gave a practical demonstration of the process, cutting a stereoscopic negative in two, and intensifying one half, when the two were compared; the one treated was greatly improved.

Mr. A. E. Casson gave a demonstration of

Collodio-chloride Printing,

introducing the subject with a few remarks. The process was invented in the year 1865 by Mr. Wharton Simpson, and for some years secured a good deal of attention; but, owing to various practical difficulties in making the paper on a small scale, combined with the high cost of production, it gradually fell into disuse. Collodio-chloride emulsion consists of silver chloride in collodion in a very fine state of division, and the excellence of the paper lies in the definite and stable character of the silver salts and the thinness and non-absorbent character of the film. The chief characteristics of the paper are: Purity of the whites, ease of toning, absence of double tones, evenness of toning, and quick drying. The paper which Mr. Casson put before the meeting was the Paget C.C. paper, both smooth and matt surface, and in his hands it had acted most satisfactorily, and left nothing to be desired, in his first four dozen not having one failure, either by cracking, curling, or blistering. A great deal depends on observing the instructions laid down for this paper; for instance, by keeping the paper between weighted boards in a cool place (or alum before toning) does away with all cracking and peeling, while blistering is generally caused by an over-strong hypo bath.

Mr. Casson then proceeded to tone prints in the Paget platinum bath, any tone being obtained at will, from a rich sepia to a perfect platinum black, and, by the interest evinced by the members, and the packets of paper distributed, there should be a fresh impetus given to this the most promising of photographic printing processes.

Brixton and Clapham Camera Club.—The Seventh Annual General Meeting took place at Brixton Hall on the 7th inst., Mr. J. W. Coade (President) in the chair.

The Report of the Council

was read, from which it was evident that great progress had been made during

the past year, no fewer than thirty-two new members having been elected, the effective numerical strength of the Club being eighty. The Council noticed with regret the resignation of the Presidency in June last by Dr. J. Reynolds, who, owing to professional engagements, had been compelled to relinquish this office, which he had held for three or four years, during which he had spared no efforts to promote the interests of the Club, of which he still remains a member. Mr. W. H. Harrison, a gentleman well known in the photographic world, who joined the Club in April, 1892, and had always placed his valuable and extensive technical knowledge at the disposal of the members, had also been compelled, through continued ill health, to resign his office as a Vice-President. The report stated that the fifth Annual Exhibition in March last was the most successful hitherto held by the Club, the Members' Class showing a large increase in the number of exhibits and quality of the work, and the Open Class (the first in connexion with the Club's Exhibitions) obtaining entries from many of the most successful photographers of the day. The autumn session was opened with a *conversazione* on October 11 last, when about 250 members and friends attended. A number of interesting papers and demonstrations, covering a wide range of photographic subjects, have been given at the ordinary meetings of the Club throughout the year, and the appreciation of them was shown by the good attendance of the members on these occasions. The report concluded by drawing attention to the improved financial position of the Club, and urged upon the members the importance of their individual efforts to ensure its future prosperity. The report was unanimously adopted, and a cordial vote of thanks passed to the President, Council, and other officers for the manner in which they had performed their duties during the past year. The meeting also passed a unanimous vote of thanks to the photographic press for their notices and reports of meetings during the year. The following were elected as officers for 1896:—*President:* Mr. J. W. Coade.—*Vice-Presidents:* Messrs. W. Fraser, Horsley Hinton, W. Thomas.—*Council:* Messrs. C. F. Archer, M. Atkinson, J. Gunston, J. Price, R. G. F. Kidson, and G. W. Welham.—*Delegates to Affiliation of Photographic Societies:* Messrs. E. Dockree, W. Thomas.—*Auditors:* Messrs. F. P. Knights, T. F. Osborn.—*Lanternist:* Mr. R. G. Mason.—*Librarian and Curator:* Mr. W. H. Stoneman.—*Recorder:* Mr. A. Whittaker.—*Secretary:* Mr. F. W. Levett, 11, Corrance-road, Brixton, S.W.—*Assistant Secretary:* Mr. W. G. Dean.

Croydon Camera Club.—The meeting on Wednesday, January 8, was devoted to the consideration of the practical value of

ISOCHROMATIC PLATES.

The subject was handled by Mr. G. R. WHITE in an able and exhaustive manner, and thoroughly appreciated by the crowded gathering of members assembled. By means of a long series of experiments, the main results of which were shown upon the lantern screen, Mr. White, amongst other things, established to the satisfaction of his audience that ordinary plates will, providing a full exposure be given, yield results in colour-rendering not inferior to those of isochromatic ones; further, that the improvement in colour-rendering possible with an isochromatic plate is not exhibited unless a prodigiously dark screen be used, and exposure be given several thousand times longer than is needful with an ordinary plate used without a screen. The colour modifications produced by interposing screens of yellow, orange, green, and blue were contrasted, and the curious fact brought out that the relative values of coloured discs are strikingly changed according to whether the discs are photographed against a white or a black background. At the conclusion of a lecture which was followed with close attention, the President called upon Mr. SANDELL, who maintained that in practice the ordinary was as good as an isochromatic plate, except that, used with a screen, the ordinary required a much longer exposure. He also showed three prints of the stained-glass windows in the Livery Hall of the Goldsmiths' Company, which appear to have their colours rendered with accurate tonality. These were taken upon a double-coated Sandell plate, a screen being used equivalent to a No. 3 Ilford screen, exposure being one hour, *f*-22, mid-day in May. Others joining in an animated discussion were Messrs. S. H. Wratten, A. W. Hirst, J. Smith, A. E. Isaac, Watson, and Rogers. In moving a vote of thanks to Mr. White, the PRESIDENT referred to the extensive utilisation by a well-known French firm of photographers of isochromatic collodion plates, which they found to give far better results than the gelatine plate. Mr. SANDELL, in seconding the vote, stated that his experiments pointed to the fact that the most effective of all-colour sensitive plates was a slow lantern plate, dipped in erythrosine. Mr. WHITE, in acknowledging the thanks, explained that the superiority of collodion did not so much lie in being more amenable to colour-rendering, but that its grain was finer, and that it lent itself to a much greater degree of intensification than does a gelatine negative. Messrs. Waghorn and F. W. Kent were elected members.

Hackney Photographic Society.—January 7,—The President (Mr. E. J. Wall) in the chair.—After the preliminary business a very lucid lecture and demonstration on the

SPEED OF A PLATE

was given by Mr. R. CHILD BAYLEY. The lecturer traced the progress of the attempts made to get at some reliable method of measuring plate speeds from Hunt's book, which appeared early in the fifties, down to the investigations of Messrs. Hurter & Driffield only recently. The instruments of Warnerke and Spurge respectively were described, and finally Messrs. Hurter & Driffield's methods, Mr. Bayley giving a very complete account of their experiments and results.

Putney Photographic Society.—At the meeting on the 7th inst. Mr. JOHN A. HODGES gave a paper on

ENLARGING.

After referring to the principles on which all enlargements were made, Mr. Hodges raised the question as to whether results could be produced by enlarging equal in quality to direct work, and answered it in the affirmative if artistic results were considered, and, in a more limited sense, said the answer would be the same from a technical point of view. Hard, wiry, biting definition in pictures of large size was to be avoided. There was something, difficult to define in words, which often stamps an enlargement as such. This is more evident when an enlarged negative has been made and a print taken from it on the glossy surface papers so much in vogue. The different lights available for enlarging were described by the lecturer, and the incandescent gaslight strongly recommended. A good portrait lens or a lens of the Euryscope pattern were stated to be the best when using condensers. The most suitable negatives for enlargement are those inclined to thinness, free from fog, and having a full range of gradation; such negatives are obtained by giving generous exposure and using well-diluted developer. If pyro is employed, one grain to the ounce will be ample. In regard to the developer for bromide paper, Mr. Hodges has a decided preference for ferrous oxalate; next to this he recommends amidol. For the former, this is the formula:—Saturated solutions of sulphate of iron and oxalate of potassium; the iron to be slightly acidified with sulphuric acid, the oxalate with oxalic acid; ten per cent. solutions of bromide of potassium also required; solutions should be filtered. Procedure is as follows: Give a full exposure, and use weak developer, viz.: Saturated solution of oxalate of potassium, 3 ounces; saturated solution of sulphate of iron, ½ ounce; ten per cent. solution of bromide of potassium, 2 or 3 drops; make the bulk up to 6 ounces with distilled water. The picture will be a little longer than usual in appearing, but, if properly exposed, will come up and attain density in great regularity, the operation being quite under control. Develop the picture a little darker than desired, as there is a slight loss in the fixing. When the picture is sufficiently dense, place in clearing bath of acetic acid, 1 drachm to 20 ounces of water. Drain off, and apply second quantity of same solution. This is done to get rid of the iron, which would otherwise degrade the high lights. After second acid bath, well wash print before fixing in freshly made hypo bath (hypo, 4 ounces; water, 20 ounces). After fixing, the prints should be well washed in running water. If development in amidol is preferred, the following is the formula used:—Sulphite soda, 1 ounce; water to 20 ounces; to each ounce add 4 to 6 grains of amidol in powder, and 5 to 10 drops of ten per cent. solution of bromide of potassium. The exposure must be more accurately timed than for the weak oxalate developer, and less exposure is needed. The bromide paper must always be soaked in water before applying the developer. The image will appear more quickly in amidol than in ferrous oxalate. It will be found easier, in case of error, to modify exposure rather than alter the strength of the developer. Hints on mounting, and framing, and preparing enlarged negatives concluded a most interesting paper. A short discussion followed, during which Mr. Hodges made still more contributions to the many valuable hints contained in his paper.

South London Photographic Society.—January 6,—Mr. Maurice Howell (Vice-President) in the chair.—Mr. HOWARD ESLER showed and described a very interesting set of 120 slides illustrating the scenery of county Antrim, Ireland, including views of Belfast, Larne, Portrush, the Giant's Causeway, Glenariff, &c. Slides were afterwards shown by Messrs. French, Gardner, Pickering, and others.

Woolwich Photographic Society.—January 9, Mr. W. H. Dawson in the chair.—After the election of four new members, the Society's new lantern, which has been built expressly by Messrs. Noakes, of Greenwich, was inspected and criticised. Several members had brought slides to be tested, this being a preliminary trial before the Exhibition (which takes place on February 27, 28, and 29) of both slides and lantern. The light given was pronounced excellent, a ten-inch focus lens being used, and some good slides were exhibited. A set of about fifty by Mr. J. H. Thompson, illustrating camp life at Aldershot, were well received.

Bath Photographic Society.—Under the auspices of the Literary and Philosophical Association, a *conversazione* took place on Friday, the 3rd inst., at the Royal Literary and Scientific Institution. The company was numerous, and included many leading citizens. The Bath Photographic Society filled the programme, the principal feature of which was an illustrated lecture on

"PHOTOGRAPHING INSECT LIFE,"

given in a popular style by Colonel Linlay Blathwayt. Some very perfect illustrations were given by the aid of the lantern. Numerous photographs, direct and of large size, as well as bromide enlargements, were displayed about the hall, all of which had been prepared by Colonel Blathwayt for this lecture. Seldom has such painstaking and skilful work in this branch of photography been shown. In addition to the foregoing there was a general display of members' work on the walls and tables. The President of the Photographic Society (Mr. Perren) showed enlargements in carbon and a fine series of Scotch views. Mr. George F. Powell sent enlargements and some fifty prints in various styles, illustrative of last season's work, mostly film work. Mr. E. J. Appleby's exhibit was the most prolific. Frenagraph and pocket Kodak sizes were chosen, and these were illustrated by all-round printing methods. This gentleman also sent a frame of transparencies showing variety of treatment, and lantern slides printed by contact from pocket Kodak films. Colonel Sesley exhibited a frame of transparencies, also an enlargement, and contact prints. Mr. Ernest Lambert showed framed specimens of portraits, large heads direct, also Frenagraphs. Rev. E. A. Purvis sent several enlargements from quarter-plate snap-shots. Dr. Norman contributed enlargements, and direct prints of antiquarian interest from film negatives. Mr. Austin J. King showed Frenagraphs and stereographs. Monsignor Williams gave illustrations of snap-shot work with the stereographs from cut films. The Hon. Sec. (Mr. Middleton Ashman) showed examples of interior and exterior work done at the excursions. After tea there was an exhibition of lantern slides, nearly all of the foregoing members contributing. Mr. Perren presided, and Mr. Appleby conducted the lantern arrangements. At the close Mr. T. F. Plowman, Chairman of the Literary Association, cordially thanked the members of the Photographic Society, and expressed a hope that there would be at least one evening of the kind each year the Societies existed, the very large attendance indicating unmistakably the popularity of these evenings. The lecture was illustrated by fifty

LANTERN SLIDES MADE FROM PHOTO-MICROGRAPHS.

After giving a definition of an insect, the lecturer explained that its body forms a kind of long sac or tube, in which there are a series of constrictions dividing it into a number of apparent segments, and that the portions between

these constrictions are more or less thickened and hardened, giving support to the muscles, so that, while we have our skeleton inside our body, the insect has its body inside its skeleton. Photographs of the mouth organs of a beetle, fly, flea, plant bug, and other insects showed the very different forms the mouth organs assumed, according to the different purposes they had to serve. A number of photographs illustrated the structure of the eye. Among Invertebrates are two types of eye, simple and compound. Simple eyes may consist of a mere pigment spot, or may increase in complexity to something approaching the structure of the human eye, which was described somewhat fully, and it was explained how the simple eyes of insects perceive objects much as we do; that is to say, a reversed picture is thrown on the expansion of the nerve endings. In the compound eyes the whole principle is different; here the surface of each eye is divided into a number of facets, the article of each forming a minute lens, the number of facets varying from a very few in some species of the ant to four thousand in the house fly, and twenty-five thousand in some beetles. A section was shown through the compound eye of a fly. In this case each facet was an outer cover like a watch glass, forming the cornea, beneath which came a lens, and then a crystalline cone, the point of junction of lens and cone surrounded by pigment cells as an iris, the cone connected with the retina by a transparent rod. In the case of the compound eye, the insect sees the actual object, and not its reversed image. Several photographs were shown of portions of eyes with facets, both hexagonal and square, one showing the image of the lamp flame in each facet. An account was given of the structure of a fly's foot, also of the spiracles and air tubes. Several slides were devoted to insect parasites, acari from the house fly, &c., and also of double parasites, such as a mite parasitic on a beetle, with a small acarus parasitic on itself, showing that there is at least a foundation for the well-known lines:—

"E'en little fleas have other fleas
Upon their backs to bite 'em;
And these, again, have smaller fleas,
And so *ad infinitum*."

Some examples were shown of objects taken by reflected light—eggs of butterflies, and some of the eggs of the stone mite, which sometimes appear in immense numbers in a single night in places where they have not been seen before for years. The lecturer ended by saying that photo-micrography was a pursuit that could be taken up by any one possessing a microscope and a camera, requiring no special apparatus, so long, at least, as only simple low-power work, such as had been shown that evening, was aimed at; but that here both original and useful work might be done by any one. One was independent both of season, time, or place; if you could not go out of doors, objects might be found in the house from which faithful pictures might be made of that on which, very likely, no human eye had ever gazed before, or, if it had, of which no record had been left.

Bradford Photographic Society.—January 9, Mr. R. J. Appleton in the chair.—Mr. W. Harmsworth, of Bradford, gave his very interesting lantern lecture, entitled

A Tour to the Isle of Wight, London, and the South Coast.

A number of very good slides illustrating the journey were thrown on the screen, and the lecture was greatly enjoyed by a large number of members. The Society's own lantern was used for the first time, and was manipulated by Mr. E. Harmsworth. The lantern was presented to the Society by Mr. F. J. R. Sutcliffe, and the nine-foot square Crystal Palace opaque screen by Mr. Percy Lund, two of the Vice-Presidents of the Society. To both of these gentlemen the Society tendera its sincere thanks for their kindness in presenting these two most useful and essential articles.

Liverpool Amateur Photographic Association.—January 9.—Mr. R. Talbot Kelly, R.B.A., gave a lecture on

Egypt and the Arabs.

The lecturer, passing quickly over the ground traversed by the ordinary tourist, dealt chiefly with the lesser-known parts of Egypt, and described the habitations, customs, and manners of the native population in parts removed from European influences. He also gave a realistic account of his visit to the Bedouins or Arab tribes of the desert, with whom he remained some time, making innumerable sketches of these picturesque, roving people, to be worked up into pictures upon his return to England. The lecture, which throughout was of a highly interesting nature, was illustrated by a number of lantern slides, some of which were direct photographs, others being photographic reproductions of paintings by the lecturer.

Sheffield Photographic Society.—January 6.—The chair was occupied by Mr. Tomlinson, and a new member elected. A set of slides, illustrating the Rivers and Broads of Norfolk and Suffolk, lent by the Great Eastern Railway Company, were thrown on the screen, the lantern being ably manipulated by Mr. J. W. Charlesworth, the descriptive portion being given by Mr. S. Camp, to each of whom a hearty vote of thanks was accorded, as also to the Manager of the Great Eastern Railway Company for loan of the slides.

FORTHCOMING EXHIBITIONS.

1896.	
February 27-29	Woolwich Photographic Society.
March 2-6	*South London Photographic Society. Hon. Secretary, Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.
, 3-6	*Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PAPER NEGATIVES.

To the Editors.

Gentlemen,—Will you allow me to add some words to the letters published in The British Journal of Photography, on December 13 and 27, about paper negatives. I did not read the discussion published before, but I adhere absolutely to the opinions of the two letter-writers. The spools of paper coated with negative emulsion are the best things for photography at home and abroad. Since I got acquainted with the negative paper of the firm Morgan, at Richmond, I have employed it in several roll-holders, and even cut in sheets in ordinary dark slides, up to the size of 18×24 c.m. (the French whole-plate). The emulsion keeps perfectly on the support paper, before, or after exposure, the development is quite easy, and one gets excellent negatives without a trace of halo, be it from a window in an interior or from the sun-lighted sky in a landscape, where the tops of the trees show often traces of halo on a glass negative.

I generally develop twenty-four negatives of drawings or printing types (which are my *spécialité*) at once in an old hydroquinone bath, and they are very good, quite black and white. For portrait or landscape I prefer our old friend pyro-soda, which gives detail and intensity at will. After washing, I squeeze the negatives on metal plates (ferrotype), and the surface of the negative is as even as a glass plate, and gives excellent prints without the grain of the paper. The only drawback of this excellent method is the want of transparency of the paper, which lengthens the printing, and renders it difficult in winter. But still I prefer it to glass plates, both for its lightness and its cheapness, notwithstanding its excellent results. In latter times I sometimes, for cut sheets, use celluloid films, which are better than glass plates, but are still inferior to paper.

If several of the good firms would make proper spools I am sure the amateurs would be tempted to try and then to adopt them. Perhaps some chemists would then try to find a method for rendering the paper translucid, and there is no doubt they would find it if they willed it.

Paris, le 8 Janvier, 1896, 30 *rue Blanche*. Marie Pellechet.

P.S.—Without mentioning the landscape architecture negatives, I have made about 2000 paper negatives, 13+18 c.m. of drawings, so you can see that I have a certain experience of the paper.

USE OF THE SWING BACK.

To the Editors.

Gentlemen,—I returned last week from a southern tour, and on reading the back numbers of your Journal, to which I have been subscriber for the last ten years, I find in your No. 1850, of October 18 last, an article on the use of swing back. This article is based upon a process which I originated last autumn, and which I published in the *Bulletin* of the *Association Belge de Photographie*, Nos. 8 and 9, August and September, my article is dated September 9, entitled "le Redressement des Lignes," and this number of the *Bulletin* was posted on September 15 and you received on the 16th as usual in exchange with your good paper.

My above article, with specimen and diagrams, has been reproduced or resumed by a great number of the photographic journals, for instance, *Photographisches Central Blatt*, No. 3; *Photographische Mittheilungen*, No. 16; *St. Petersburg Photographic Journal*, No. 10; *Photo Gazette Paris*, No. 12; *Bulletin de la Société Photographique*, No. 9, all dated October, and they all mentioned my name and the origin, in connexion with the process, your Journal being the only exception.

It is true, your article extends beyond the particulars given by myself in the articles, but your second paragraph of second column shows clearly that the base of process is the one given by me, namely, the combined inclinations of the negative and the positive sensitive tissue. It is not a considerable matter to find this, but something new always takes a considerable trouble to be found out, and, when publishing the result, it is but a small compensation if our name be published in connexion with same.

I feel certain it is also generally your habit to name in your Journal the origin of the articles or processes you publish, and that it was on this occasion an oversight if it was not done.

I should be glad to learn if this is so, the more as I have other novelties relating to stereoscopic photography which I might shortly bring under notice.—I am, yours, &c., Victor Selb.

45, *Avenue Moretus, Anvers, January* 6, 1896.

The above letter has been forwarded to the writer of the article in question, who replies as follows:—

"This is a very curious instance of two writers travelling almost simultaneously over the same lines, but you can assure M. Victor Selb that the article he refers to was not inspired in any way by his communications to the Belgian journal, as neither at the time it was written nor up to the present have I seen his article nor any of the re-

productions or references to it. What I wrote was purely from work actually in hand at the time, and was scarcely put forward as presenting any novelty to ordinary photographers except in as far as I wished to demonstrate that for enlarging purposes, in order to secure the very highest class of results, it is better to avoid the use of the swing back *in taking the negative*. I do not know, of course, the general tenour of Mr. Selb's article, but I judge from the reference he makes to mine that he attaches importance to the swinging the negative and sensitive plate in contrary directions so far as swinging the negative or proof to be copied is concerned; it has, of course, been known to every one that sloping perpendiculars can be corrected by this means, and, in order to secure sharpness in the copy, it is such an obvious and necessary corollary that the sensitive plate or surface be swung in the contrary direction, that I really cannot say whether or not it is a matter that was or was not known generally. I merely mentioned these two points as being absolutely necessary to perfection in result, and, if there was anything "novel" at all in the article, it was the formula for calculating the position in which the negative must be placed in order to secure at once accuracy of lines as well as absolute sharpness. It may also be new to many that an absolutely better result can be secured under such circumstances by tilting the camera as much as may be necessary, and letting the swing back and sliding front alone when the negative is taken, and doing what is required to secure perpendicular lines when the enlargement is made."

STEREOSCOPY ON THE SCREEN.

To the EDITORS.

GENTLEMEN,—In the paper by Mr. Freshwater, given before the London and Provincial Photographic Association, and published in the JOURNAL last week, he commences by claiming that his method of obtaining a stereoscopic effect on the screen has not been shown before in this country. If I understand the method correctly, I think that it has. At the Wolverhampton Free Library Science Students' Soirée some years ago, I assisted Mr. W. Whitehouse, F.C.S., to give an entertainment by a similar method. We used an ordinary biunial lantern and limelight.

A square of specially selected red glass was placed behind the slide in one lantern and a specially selected green behind the other. A slide from one half of the stereoscopic negative was placed in one lantern (illuminated by red), and a slide from the other half of the same negative in the other lantern (illuminated by green), the two pictures being thrown nearly coincident on the screen. They were viewed through a pair of spectacles prepared with similar red and green glass to that used in the lantern, an audience of about a dozen being accommodated at once, as we only had that number of spectacles.

There was a little difficulty in getting the "effect," and I discovered afterwards it was due to the two objectives being of slightly different focus.

The exact date I cannot give from memory, and I have not the programme up here (I can obtain one), but it is at least four or five years ago, I should say.—I am, yours, &c., T. W. DERRINGTON.

12, *Guildford-road, S.W., January* 13, 1896.

DR. EMERSON AS A NOVELIST.

To the EDITORS.

GENTLEMEN,—In your kind and prominent comments upon Dr. Emerson's latest book, *Marsh Leaves*, your critic suggests that, were Dr. Emerson to devote himself to fiction, he might do for East Anglia what Mr. Hardy has done for Wessex, and Mr. Blackmore for the west.

May I point out that Dr. Emerson has already produced several works of fiction, notably, *A Son of the Fens*, *English Idyls*, *East Coast Yarns*, *Tales from Welsh Wales*, and *Signor Lippo*, all of these works having received the best of notice from the best literary papers, *e.g.*, *Saturday Review*, *National Observer*, *Athenæum*, &c., and some of the very best and most distinguished men claim that some of them 'belong to literature!' Further praise is not needed.

I assume your critic is not a student of general literature, and, as such works as the above are not sent to the photographic press for review, he has missed them. Trusting that this may lead him and others to the books themselves, books that are caviare to the public and people of school-board education.—I am, yours, &c., LITERATURE.

THE PHARMACEUTICAL SOCIETY.

To the EDITORS.

GENTLEMEN,—As one of those who, by agitation in the trade press (three or four years ago), did something to stir up the Pharmaceutical Society to take action against unqualified tradesmen, I may be allowed to say that I never imagined that Mr. Hume would find himself in the position of "defendant." For my part I always conceived him to be "one of the fraternity," at the same time I knew (and know still) of similar illegalities in high places.

I certainly consider all the sympathy expressed for Mr. Hume *ill-considered*, except, of course, from a personal point of view.

Mr. Hume says, I think, that he has been in the trade thirty years. What trade—that of an optician? I have been in Mr. Hume's shop some years ago, and it certainly looked to me uncommonly like that of a chemist and druggist. Be that as it may, he must have been perfectly well known the powers conferred upon the Pharmaceutical Society, and the exceptions allowed, which might possibly have brought Mr. Hume into line with the great body of pharmacists, had he cared to entertain the idea.

I entered the trade twenty-seven years ago, and, as my certificate is dated 1873, it will be seen that the examination was no stiffer than a person of average intellect could pass. Why could not Mr. Hume have done the same, knowing, as he must have done, of the existence of the Pharmacy Act of 1868?

My recollection is that the trade in photo-chemicals was at the time (1868) of a very limited character. In the town where I was apprenticed, *an optician* certainly did something in it. I knew him quite well, but I knew also that one of the chemists (and druggists) also made a speciality of photo-chemicals, and such pure reagents, &c., as are required by analysts, &c.

In another large town in the West of England, I know for a fact that one of the chemists there did the bulk of the trade in the apparatus and chemicals, &c., then used by the old wet-collodion workers. I was an assistant there, and saw and heard many indications and reminiscences of those old days. Going north, we know that Mawson & Swan have been from the first connected with pharmacy. Many similar cases could, no doubt, be found, proving that, *all along*, the sale of these goods has been for the most part in the hands of chemists and druggists, or men who were at some period of their lives connected with the drug trade.

Many of the statements made in the letters of your correspondents are, on the face of them, exaggerations, to say the least. It is inconceivable that a person who has had to pass a stiff examination in chemistry (see the present minor syllabus), including analysis, and who must have spent some months at least in a properly qualified laboratory (where the necessity for purity, and so on, of all reagents used would be impressed upon him), should, when in business for himself, deliberately supply any article for analytical purposes *impure* and *unfit* for such use. It is a well-known fact, that in most towns of any size there is *one* chemist and druggist who appears to be *the* man who lays himself out for the supply of chemicals and reagents, and to whom doctors, and chemists, &c., go when they want such goods. Run over a few towns, and the names of these men come naturally to the lips: Newcastle-on-Tyne, Mawson & Swan, or Brady & Martin; Leeds, Reynolds & Branson; Cheltenham, Thomas or Beetham; Leicester, Joseph Young; Great Yarmouth, Wm. S. Poll, and so on.

Many of your readers may have an idea that the profits of the druggist are *enormous*. Tell them that we pay 9*s.* 3*d.* per dozen for Beecham's, and sell at 9½*d.*; 11*s.* 6*d.* per dozen for Seigel's, and sell at 1*s.*, to take two of the best known; and that stamped medicines—even the rarer sort—are all similarly "cut," and they won't believe you. Drugs and chemicals are all "cut" in the same way, and some amateurs expect even their developers at the bare cost of the contents. *Dispensing* charges are at least fifty per cent. lower than when I was an apprentice.

All that is conserved to us is the "poison schedule," and this is, as a rule, more trouble than it is worth. For my part, I don't keep half those on the list, and rarely supply the other half. It is not worth the risk, for the fact that due precaution has been taken doesn't prevent a man poisoning himself, and also is no safeguard against uncalled-for strictures (you have only to read some reports of inquests of late years) on the part of *coroners*, who *ought to be*, but are not, better informed.

The fact is, the agitation *in re* Mr. Hume, is little more than sympathy with an undoubtedly clever and (morally) qualified, *but unregistered*, man. But who's to blame for that? I know several clever and good fellows who are much in the same boat; one of them is as good as a full-blown M.D., but, somehow, he can't get through, and another has passed *at various times* all the subjects in the minor, but has never been able to do them all at the same sitting!

For my own part I practise dentistry, surgical and mechanical; but I should not do so, nor expect to be allowed to call myself a dentist, were I not qualified and *registered*.

It is quite true that things are very different to what they were twenty-five years ago. Various new industries have grown up, but it cannot be denied that the Pharmaceutical Society has, in the matter of *education*, kept *in the front*. Pharmacists or chemists and druggists are an educated body of men, and can do all that is required of them, with, of course, the usual exceptions, as in all trades and professions.

Alter the law if you like, and if it be necessary. Many chemists will support reform. But don't run away with the idea that there are heaps of "*fat*" in pharmacy.

I was once managing a business for a gentleman whose name stands exceedingly high in the estimation of photographers. He told me that he wished "me to have all I could make there in the way of profit, he was quite satisfied if he got enough out of it to pay for his gloves;" but I could only make 3*l.* or so per week, so hampered were we by unqualified grabbers.

However, I must bring this to a close, and, with apologies for the length of this letter,—I am, yours, &c.,

D. D.

ILLINGWORTH *VERSUS* DRAYCOTT.

To the EDITORS.

GENTLEMEN,—Kindly allow me, through the medium of your valuable paper, to tender my sincere thanks to the profession for their letters of sympathy in the loss of my recent action. It is something to know that there are others who have had precisely the same experience. I much appreciate the sympathy extended towards me.—I am, yours, &c.,

J. A. DRAYCOTT.

66 *and* 67, *New-street, Birmingham; Leicester-square, Walsall; and* 11, *Gold-street, Northampton, January* 14, 1896.

SOCIETY OF LADY ARTISTS' PHOTOGRAPHIC EXHIBITION.

To the EDITORS.

GENTLEMEN,—I enclose you a prospectus of the Exhibition of the Society of Lady Artists for 1896. As art photography forms one of the classes of exhibits, it may be of interest to your readers.

I may mention that George Davison, Esq., late Secretary of the Camera Club, and Lyonel Clark, Esq., are the Judges in the photographic section; and their names are a sufficient guarantee of the class of work which will be admitted.—I am, yours, &c.,

FANNY E. PARTRIDGE, *Sec.*

9, *Nottingham-place, W., January* 13, 1896.

[Particulars of the photographic section may be obtained of Miss Partridge at the address given.—EDS.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon.*

LANTERN.—W. V. MORRIS.—If the figures be cut out and mounted on glass as a lantern slide, and used as such, they will be perfectly sharp when projected on the screen.

VEILING OF NEGATIVES.—BRAMDEAN. The veiling, when some of the negatives are treated with acid, is because, in the instances when it occurs, the negatives are not sufficiently washed.

PATENTS; CALCIUM CARBIDE.—GEO. PITCHER says: 1. "Can I make a patent for my own use in trade, not to sell? 2. Where can calcium carbide be procured."—In reply: I. We presume you mean a "patented article." No. 2. Harrington & Co., 53, City-road, E.C.

AGREEMENT.—PRINTER. We cannot say if the agreement is a legal document or not from the data given. If it is, you can, of course, claim your salary, according to the terms of it, to the end of the term. You had better submit it to a solicitor if there is any dispute in the matter.

FACTORY ACTS.—UNCERTAIN and BRAMDEAN. We should opine that neither case comes under the Factory Acts; but the abstracts and notices supplied, of course, give the necessary information if carefully read. If there is any further doubt on the subject, apply to the Factory Inspector of the district.

PROCESS SCREEN.—L. E. N. S. Wire gauze, however fine, will not do in place of a properly ruled screen. Even for experimental work you should have the right thing, or you will not be able to judge how far your failures may be due to your manipulations, or to the make-shift appliances. Small screens are not so very expensive, after all.

STUDIO.—R. HOW.—The sketch shows a very good form of studio for all-round work, and the proportions are also good, except the length. If you can get another three or four feet, you will find it a great convenience at times. Twenty-three feet is a little too short for standing figures, full length, as it necessitates the use of lenses of shorter focus than is desirable.

SCRATCHED LENS.—S. CRESSY.—The only way to remove the scratch on the lens is to regrind and polish the surface. But there is really no reason to do this, as the scratch will do no harm at all in practice. The only thing is there is a *very* slight loss of light from the scratch, and nothing more. If you try the lens, you will discern no difference in its working.

OIL STOVE.—SEPTIMUS. The fumes from this will do no harm in the dark room. There should be no smell if the wicks are kept in good trim and the stove itself is kept clean. More smell arises from the oil outside the stove than from the wick. If the stove is wiped scrupulously clean in all parts, and the wick is in good order before it is lighted, there will be no smell from it, supposing, of course, that good oil is used.

DISTILLED WATER.—LEEDS says: "We have a steam engine always running, and I notice that from the exhaust pipe there is always a small stream, or series of drops of water. Is this not distilled water, the same as sold by chemists?"—It is distilled water, but highly impure, as it is contaminated with greasy matter from the engine. Such water would not do at all for photographic purposes. Tap water, however bad, would be better.

TONING DISCOLOURED PAPER.—R. W. C. If the paper is all discoloured to the extent of the sample sent, it will be quite impossible, with any toning bath, to get pure whites. Of course, there is always a risk in buying "job lots" at miscellaneous dealers'; moreover, you say that you have had it by you some months, hence it must be in a worse condition than when you first bought it. The only suggestion we can make is to throw the stuff into the waste basket.

VARNISH.—W. PAGE asks for a varnish that can be applied to the negative cold and will dry quickly. Such a varnish is made by dissolving dammar resin in benzole. No very definite proportions can be given, as different samples of dammar make a more viscous solution than others. Better make a solution of about thirty grains to the ounce, and then dilute it if too thick. Dammar varnish is not so durable, or will bear the same rough usage as a spirit varnish, with shellac as a base.

WOODBURYTYPE.—R. W. (Glasgow) writes: "Can you tell me where I can get Woodburytype blocks made from my negatives, and if a licence is required to print photographs by the Woodburytype process?"—We are not aware that any one supplies Woodburytype blocks to the trade. You might apply, however, to those who do Woodburytype printing, and ascertain if they do—the Woodburytype Company, or Waterlow & Sons, for example. No licence is required to do Woodburytype printing.

RESIDUES.—AGENT says: "I shall be much obliged if you will give me the best means of saving gold and silver residues."—To the washing waters of the prints add common salt or hydrochloric acid. The silver will then be thrown down as chloride. To the fixing baths add sulphide of potassium, which will throw down the silver as sulphide. To the toning bath add a solution of sulphate of iron. Collect the precipitates, dry, and send to the refiner. Keep the gold and silver residues separate.

WASHING PRINTS.—E. MITCHELL writes as follows: "In the directions sent out with the new printing papers we are told to wash the prints, after fixing, one or two hours, and not longer. Is that long enough? With albumen paper many do not consider the prints are sufficiently washed unless they have been in running water all night"—The time mentioned is long enough if the prints are attended to all the time; but, if they are merely left soaking in water, they will be insufficiently washed. Albumen prints can be as well freed from the hypo salts in a couple of hours as by an all-night's washing, that, is if the work is properly done.

STAINED BACKGROUND.—Y. Z. X. says "the rain got through the roof of the studio on to the background, and has made a stain right down the middle of it. Can you tell me of any means of removing it? It is done in distemper colour."—We are afraid we cannot say how the stain is to be got rid of except by recolouring it. If, at the time the water got upon it, the background had been made evenly wet all over, it would have dried without showing a mark. Sometimes thoroughly wetting a distemper background will remove old stains, but not always, though the treatment will do no harm, if it does no good, if the dust be carefully removed before the water is applied.

UNDER-EXPOSED NEGATIVE.—F. DUNSTER says: "I send you by this same post a roll, containing the 12×10 photograph of a landslip. The photo has been printed from my negative by one of the best photographic companies in the kingdom. Will you oblige by telling me wherein the fault of its extreme darkness lies? Can anything be done to the negative, or will it print better as a platinotype or bromide than as silver? I am not a photographer, but I bought last year a very fine series of negatives, all 12×10 and, with exception of this and interior of church, they have printed off beautifully."—In reply: Judging from the print sent, the negative sent is very much under-exposed. Possibly a better result could be obtained on gelatino-chloride or collodio-chloride.

TONING AND FIXING.—E. C. PEALL writes: "I have a question which I have been troubling myself very much about. I wish you to tell me if the prints toned and fixed in one solution have the same keeping quality as those done in the sulpho-cyan-toning and fixing bath in two solutions? I find it very easy to do my prints in the toning and fixing; would it be more permanent if I transfer them from the F. and T. into a solution of hypo?"—If the toning and fixing bath is used with judgments it is said to give stable results. But there is no question that toning and fixing in separate solutions gives much greater promise of permanence. It is for this reason that is generally preferred. There would be no harm done in using a fresh solution of hypo after the combined bath, even if it did no good. If two baths be used, why not tone in one—sulphocyanide and gold—and fix in the other?

*** Several answers to correspondents, Our Editorial Table, and many other communications are held over through extreme pressure on our space.

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EX CATHEDRÂ.

The election of the Council and officers of the Royal Photographic Society, which takes place next month, is exciting great interest among the members of the Society. There are rumours of a contest for the Presidency, although what possible chance against Captain Abney most opponents could have it is difficult to discover. A self-elected caucus, however, has taken upon itself not only to run a candidate for the Chair, but also in the cause of "progress" is trying to exclude from the Council a few of the older members who have been re-elected for a good many years, but whose further presence on that body is supposed in some mysterious way to interfere with the progress of the Society—and photography.

* * *

The agitation for sending the old members of the Council to the right-about was certainly not organized with any appropriateness as regards time or opportunity, and, although the Special General Meeting at which the matter was discussed was, with the exception of two gentlemen, unanimously in favour of some inchoate plan for providing a free flow of new blood, it is possible that nothing further will be done in the matter for some considerable time to come. Some of the older members of the Council are said to make no secret of their determination not to stand for re-election; so that, if this should prove to be the case, there can be no great hurry to proceed with any ill-considered "new blood" scheme. Besides, there are many members of the Royal Photographic Society who are of opinion that in very recent years the enormous amount of time which the Society has passed in discussing questions of internal policy and detail has been, if not altogether unnecessary, at any rate largely in excess of the requirements of the case.

* * *

But why specially legislate for the introduction of "new blood" when, by the system of free election which the members still enjoy, the matter, as it always is and should be in self-governing corporations, rests entirely in the hands of the electorate, who have perfect freedom of choice—the ideal and only proper system of exercising the franchise? Time and nature are the surest agents of transfusion, as any one interested in this particular instance, may learn for himself by comparing the *personnel* of the present Council of the Royal Photographic Society with that, say, of 1890. Again, what changes and improvements have been effected in the Society during those years, all, be it noted, with the countenance and presence on the Council of this objectionable "anti-progressive" old blood! We venture to express the hope, as we expressed it last year in reference to an attempt to force gilt-edged men into the Council, that "members will vote solid for the old Council." A Society that has been governed as the Royal Photographic Society has during the last few years has nothing to complain of against its governors.

* * *

We are asked by Mr. W. I. Chadwick, of 2, St. Mary's-street, Manchester, to state that, at the request of honorary secretaries and members of photographic societies, he has arranged to attend their meetings and lecture on stereoscopy or the modern magic lantern. Of both subjects Mr. Chadwick has had many years' practical experience, and, in return for his services, he modestly asks that his out-of-pocket expenses only should be paid.

* * *

Messrs. Cadett & Neall, Ashtead, Surrey, forward us the latest price-list of their plates and other productions, with which some useful hints regarding development are given

They make the interesting statement that, since the introduction of their plates in 1892, "the sensitiveness of the gelatine dry plate has been increased six or seven times." An automatic exposure indicator, working with the dark slide, is also a recent introduction of Messrs. Cadett.

* * *

We are sorry to read in a French contemporary that M. Attout-Tailfer, whose name was associated with the introduction of orthochromatic plates as articles of commerce, died recently in Paris. The deceased gentleman, it was said, was a painter of great ability.

* * *

Professor Hubert Herkomer is a man of such marked energy and power that it would be running a serious risk to cast doubts on the probability of his being able to carry into execution all that he professed himself competent to do; nevertheless, we confess to entertaining a feeling of scepticism as to the literal feasibility of the *tour de force* in reproduction processes which, according to the *St. James's Gazette*, the Professor claims to have accomplished.

* * *

"If the reception," says our contemporary, "accorded on the Continent to Professor Herkomer's new invention is any criterion of what will happen when it is seen at the Fine Art Society's at the end of January, we may expect a cordial welcome to a process which plays so admirably into the hands of the artist. Professor Herkomer claims that he can convert a painted surface into a plate suitable for printing without the intervention of photography, or even of those preliminaries of biting, rocking, and other technicalities which have for so long deterred the painter from taking to etching or mezzotint engraving. He will now be able to be his own interpreter in black and white, with the full assurance that his direct touch and original idiosyncrasy will now, for the first time, reach the public. The Exhibition at the Fine Art Society's will consist of some forty plates, many of considerable importance, from Professor Herkomer's hand; and, as he has consented to have a demonstration of the whole process during the course of the Exhibition, those interested in this autographic art will be able, not only to see the result, but how it is arrived at." We await particulars of this process with much eagerness.

* * *

At Scarborough, during the months from May to October next, there is to be a Sports, Games, and Industrial Exhibition on a somewhat extensive scale. A class will be set aside for photography and the appliances connected therewith. Mr. Joseph Davis, Exhibition-buildings, Scarborough, is the General Manager, and all particulars may be obtained of him.

* * *

"Ignoramus," under which pseudonym an esteemed correspondent, who is a professional photographer, conceals his proper name, draws our attention to a newspaper paragraph which alludes to Mr. W. Ingles Rogers' recently recorded experiments in the development of images impressed in plates simply by the alleged persistent action of the eye. Our correspondent says: "I should like to hear what make of plate will give an image *without receiving any actinic rays*. It does not transpire at what distance the operator 'stared' at this wonderful plate, neither does it account for the fact that only an image of the coin, and *nothing else*, was developed. One is never too old to learn, so I await your reply with interest."

On the assumption that both Mr. Ingles Rogers' experiments with the retinal projections of coins and postage stamps were really performed as described, and that Professor Röntgen's remarkable results, due to the passage of the electric current through a vacuum tube and the opaque object to be reproduced, have been duplicated in this country (as is the case), the answer to our friend's question would appear to be that probably all commercial plates are sensitive to these "non-actinic" impressions. Doubtless, if Mr. Ingles Rogers sees "Ignoramus's" other questions, he will kindly answer them.

OPERATORS AND EMPLOYERS UNDER AGREEMENTS.

The lawsuit—Illingworth *versus* Draycott—tried at the recent Birmingham Assizes, before Mr. Justice Cave (see page 26, *ante*), is one of more than passing interest, as it illustrates several points in connexion with the photographic profession, such as we frequently have to deal with in the "Answers" column. Briefly, the facts of the case are these. The plaintiff, Mr. W. Illingworth, had been for some years in the employment of Mr. J. A. Draycott, as manager of a branch establishment of his. Then an agreement was entered into for the plaintiff to take the management of the Birmingham house, for a term of years, at a salary commencing at five, and rising to six, guineas a week. Under this agreement, the plaintiff undertook not to practise photography within a radius of eight miles of the defendant's establishments for five years after the expiration of the term. There was a clause, usual in such agreements, that the plaintiff could be dismissed with a month's notice for such things as gross mismanagement or neglect, insobriety, want of skill, misconduct, &c. After a few months the plaintiff was dismissed. It was on the ground of want of skill that he was dismissed.

The action was brought for damages for wrongful dismissal. Beyond the question of damages, there was another important point involved. If it was proved that the plaintiff was wrongfully dismissed, the learned Judge would hold that the agreement not to practise photography within the right eight mile for the stipulated time became void, and he could then practise the art wherever he might choose. This he can now do, as the jury found a verdict for the plaintiff with 200*l.* damages. That is but equity, as an agreement is binding on all the parties to it.

During the hearing of the case some interesting items in the internal working of studios came out. One was this: the plaintiff, it was stated, had taked 800 portraits, and out of that number there had been 153 resittings and twenty-five had second resittings, and the question arose as to whether that was an undue proportion. On this point the witnesses called for the defendant—and the learned Judge ruled, early in the case, that the onus of proof of incompetence rested with the defence—would not give any definite opinion. It was stated by one gentleman that some photographers almost courted resittings, while others would only give them with reluctance. With reference to some of the photographs called into question the Judge, in his summing up to the jury, said the defendant's order was, "Get their money and do something; and, if it is not liked, they can sit again." One of the witnesses, from London, said with regard to a group of four ladies, one of whom was going abroad, that in such a case he, to ensure a good result, would expose six plates—the plaintiff had only exposed three. This illustrates how so many plates are consumed by

some houses, and the cost at which some portraits are obtained. Six plates for one photograph would certainly be looked upon as an unnecessary expense by some employers. Those who are familiar with studio work will readily understand that out of eight hundred sitters, taken by any one, there would be some inartistic portraits, particularly with infants and young children, and the question before the Court was, under the circumstances, whether what was less than twenty per cent. was an excessively large number, and, as we have just said, none of the witnesses would say that it was. It is well known by portraitists that it often happens that a person will have several resittings, where they are given freely, and, after all, fall back on the first portrait taken.

An operator always labours under certain disadvantages in the studio, particularly if it has been worked previously by the proprietor; sitters, as a rule, prefer to be taken by the principal, although the operator may be the cleverer artist of the two. If a portrait does not please, it is no uncommon thing for complaint to be made, to the principal, of incompetence, or other fault, on the part of the operator. Out of the 800 sitters, thirty-eight letters of complaint had been received. On this point the Judge, in his summing up, said: "It was not within human possibility to please all, and, naturally enough, some complaints had been made. But were they excessive? No witnesses had said they were." Sitters will often have their own way with an operator, although he knows quite well the result will be unsatisfactory, while the principal would decline to let them have it, and with him they would acquiesce without demur.

Some parents will insist on having their infants photographed in a state of nudity, and it is frequently impossible for an artist to obtain an artistic pose, and at the same time a pleasing expression, and the results often turn out similar to some of the photographs referred to in the trial, and which might well be considered indecent by some. On the subject of photographs of nude children, Mr. Justice Cave said: "Although he should never desire such things, if parents come and say, 'I want them,' then he thought that the operator was only exhibiting that forbearance and effort to please expected from him if he endeavoured to grant their request." The learned Judge took a thoroughly practical view of the case throughout.

THE INTENSIFICATION OF NEGATIVES AFTER DRYING.

II.

Turning to collodion plates, we have, of course, entirely different conditions to meet, as the collodion itself, unlike gelatine, is impervious to water, though in most cases, at any rate of wet plates, the physical character of the film is such as to permit the water to penetrate it with considerable freedom. In many dry plates, more especially washed emulsion, however, the film is of so close and horny a nature after drying as to be absolutely impervious to aqueous solutions, and it is seldom that any satisfactory action can be obtained without proper preparation. Again, the difference between a bath plate or one on which the image has been produced by silver development must be taken into consideration as against those in which alkaline pyro or one of its congeners has been employed. In the one case the image consists of a more or less granular metallic deposit outside the film, while in the other it is embedded in the aforesaid horny layer of collodion. Wet-plate films consequently present comparatively little, if any, difficulty, while those on which chemical development has been used are always more or less troublesome to manipulate after once drying.

To prepare these films for subsequent treatment, they should be immersed, for a minute or two, in tolerably strong alcohol, and then laid in a dish of water until the spirit contained in the film has been replaced by water. When the latter is found to flow evenly over the surface, it should be poured away and a fresh lot added, which will cause a reappearance of the "greasiness," showing that all the alcohol has not yet been removed by diffusion; this must be allowed to remain until smoothness prevails, and the operation repeated, if necessary, until that end is attained. Not until the change of water ceases to produce "greasiness" should the tap or jug be resorted to, or unevenness in the after-process will be the result.

In very bad cases—where the collodion has become very horny and impervious—we have found considerable benefit from the addition of glycerine to the alcohol, in the proportion of one part of glycerine to seven of alcohol, which, in this case, may be of much lower "grade," "proof" spirit being quite strong enough. A few drops—a very few only can be safely used—of sulphuric ether may also be added, but this is an addition that must be resorted to with the greatest caution, and only in extreme cases. Wood naphtha or pyroxylic spirit also answers well, better indeed than ordinary alcohol, as it appears to open up the pores of the collodion more effectively. In using any of these latter solutions or mixtures of them, the same precautions must be observed as in the case of alcohol, namely, the water must be allowed to displace them as gradually as possible, and, this attended to, the final state of those films will differ little, if at all, from such as have not been dried.

As a matter of course, if the films have been varnished, the removal of the varnish is the first necessity; and, if this be properly effected, it follows that the film will be restored to a sufficiently porous condition, whatever its original character. The alcoholic varnish penetrates more or less into the "horniest" collodion film, consequently it acts directly in keeping it "open."

If any doubt exists as to whether a collodion negative will require subsequent treatment, it is advisable, before trying it, to flow it over with a weak aqueous solution of some substance soluble in water, that can afterwards be dissolved out. Very weak gum water, or albumen, or a five-grain solution of tannin, answers well; failing anything else at hand, a solution of loaf sugar may be used, but, owing to its hygroscopic nature, this should always be removed before finally varnishing the negative.

Pyro and Ammonia.—The cause of what might be termed the differential action of the various alkalies when added to solutions of pyro is still an undetermined problem. As a contribution to its solution there may be noted an extract from a paper, "Experiments in the formation of the so-called ammonium amalgam," communicated to the last meeting of the Chemical Society by Messrs. James Proud and W. H. Wood, F.I.C. They have found that sodium amalgam does not form the so-called ammonium amalgam when added to an aqueous solution of ammonia, and hence it can be used as a test for ammonium salts, even in the presence of free ammonia. They were able to show by these means that solutions of pyro and aqueous ammonia contained a compound in the nature of an ammonium salt. The amount of ammonia so taken up is, however, not stated.

Photography at the North Pole.—Our readers are, doubtless, familiar with the project of the Norwegian aeronaut, M. Andrée, who intends to try to reach the North Pole in a balloon. The project is only so far advanced as the final choosing of the material the balloon is to be composed of. This, however, is settled, and, at the same time, general arrangements have been planned. The Swedish physician who is to accompany the expedition will have charge of the photographic department, some idea of the expectations with regard to which may be formed when we state that it is said that 20,000 plates are to be taken. Films, we presume, will be used; but whether we are likely to see any views of the region so enveloped in mystery and speculation is very problematical.

Panoramic Projection.—A novelty in lantern projection has been devised by an American, Mr. Charr, and is fully described and illustrated in a recent number of *La Nature*, which acknowledges its indebtedness to the *Western Electrician* of Chicago. Briefly, the apparatus consists of a huge lantern installation, suspended from the ceiling like a chandelier. This contrivance holds the operator and eight lanterns, each lighted by an electric arc, and throwing a combined picture on a screen of cylindrical section, ninety metres in circumference and ten high. Extremely accurate registration is required, that in the junction of the views no awkward overlapping takes place. This is brought about by the accurate placing of the chandelier-like lanterns and lanternist stand. The pictures once arranged and planned for continuing in series, a further improvement is carried out by introducing kinetoscope pictures in motion, thrown upon the screen in the usual manner from a second lantern system. The apparatus is as ingenious as it must be costly, but we much doubt the commercial success of the scheme, especially at the present time, when, judging from provincial and other accounts, the public seem to be surfeited with lantern shows.

The Solar Eclipse.—The advertising columns of the scientific papers seem to be leading to lively incidents. The Orient Steam Navigation Company advertise the dispatch of two steamers Cook & Son personally conduct. Messrs. Gaze & Son send the *Norse King* to Vadsoe. *Nature* writes last week: "We notice with some astonishment, in a circular issued by Messrs. Gaze & Son, the statement that an official party of observers, arranged by a joint committee of the Royal Society and of the Astronomical Society, are proceeding to Norway, and will travel by the ss. *Norse King*. We can hardly think," continues *Nature*, "that this statement is authoritative, for scientific committees are not in the habit of advertising their intention to patronise any particular line of steamers; and, further, astronomers usually require more than five days to adjust and set up their instruments, if any work of real use to science is to be done." Then comes a sneer at photography which much surprises us in the pages of this esteemed journal. "Of course, those photographers who merely wish to take snap-shots at the corona do not need to make any elaborate preparations, and, if the steamship they travel by carries them into harbour two or three days before August 9, they will have ample time to point their cameras properly."

Liquid Air.—We have already drawn attention to the fact that the production of liquid air is now a realised commercial project. Whether the consequent expected separation of a portion of the nitrogen from air at one stage of the process will be of any value as a practical supply of gas for lantern purposes remains to be seen. Meanwhile the processes of Dr. Dewar for the liquefaction and solidification of atmospheric air continue to excite great interest, and, incidentally we may state, acrimonious discussion, and at a recent meeting Dr. Dewar read a paper of absorbing interest on the subject.

He stated that when a litre of liquid air is placed in a globular silver vacuum vessel, and subjected to exhaustion, as much as half a litre of solid air can be obtained and maintained in this condition for half an hour. The solid state is comparable to a jelly, which, when examined in a magnetic field, has the liquid oxygen drawn out of it to the poles. The jelly is clear and transparent, but is milky if the carbonic acid be not removed. Of course this would be no commercial mode of obtaining oxygen and air, but the large apparatus he describes "can be arranged to deliver liquid air containing forty-nine per cent. of oxygen, which gives off gas containing twenty per cent. of oxygen, rising, after six hours, to 72·6 per cent. The percentage of oxygen can be increased by a slight change in the manner of working." By Linde's process, the plans of which are not yet published, liquid air containing seventy per cent. of oxygen in fifteen hours is obtained.

Dark-room Windows.—Now is the time to examine dark-room windows, especially those in which paper or "fabric" is used, in order to see that they are safe. Such materials, we may say, invariably fade, or become lighter with time, and especially if subjected to damp or moisture. During the past month or two this condition has prevailed naturally, but at the same time the light has been so feeble that any fading of the window colour may have escaped detection—indeed, it is not by any means improbable that many of our readers may have been forced to intentionally "lighten their darkness" during the winter months, in order to be able to see at all. Now, however, the light is increasing in photographic value daily by leaps and bounds, and a window that may have been "safe" last week will, perhaps, be far from it next. This fact was forcibly impressed on us one bright day last week, in the case of a ruby glass window, over which, during the summer, we had stretched a sheet of yellow paper, which, however, has been removed during the winter. The bare glass alone has proved quite safe until an unusually bright and improving light, in conjunction with a fairly rapid plate, aroused us to the fact that it was becoming dangerous.

We may remark that it is a good plan, when paper or fabric is used, to employ a thin coloured glass also as a sort of protection to the paper. Coloured (yellow, or so-called "ruby") glass may be obtained cheaply enough that is quite unsuited for dark-room purposes, but a long price must be paid for such as is really fit to use; hence the general employment of such cheaper makeshifts as the paper and fabrics so widely used, which, however, suffer from want of permanence. But the cheap coloured glass, if not fit for use alone, suffices to protect the paper or fabric, and prevent its bleaching by the light; so a combination of the two affords a cheap, and at the same time efficient, substitute for the more expensive glass. For this purpose cheap pot-orange or yellow is dark enough to prevent the paper fading, and at the same time is light enough to admit of the use of a "safe" fabric.

SOLUBILITY OF SILVER IN HYPOSULPHITE OF SODA.*

From this experiment it seemed clear to us that access of air had something to do with the reduction of the density of the image, and in order to test this the following experiments were made:—

A glass tube, about eight inches long, was closed at one end and a strip of graduated paper introduced; the open end was then drawn out, and, when cold, a twenty-five per cent. solution of pure hypo introduced by means of a funnel. The tube was filled as full as possible and then sealed. It was not until a week had elapsed that the image turned somewhat yellow, and, though a reduction in density took place, it was not carried as far as in the case of the paper which was freely exposed, nor yet did it become as yellow, the gradations being plainly visible. The absence of air, therefore, considerably retarded the action of the hypo on the silver image.

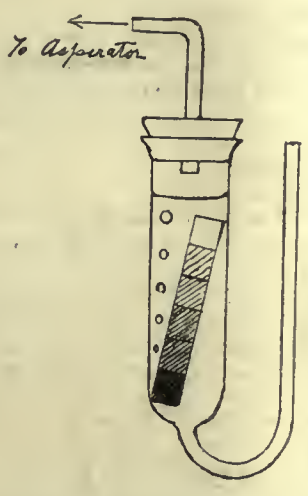
A piece of gelatino-bromide paper was then exposed to light, developed, fixed, and washed; it was then subdivided, one piece was placed in a glass tube, and the remainder in a beaker. A saturated solution of hypo was then prepared, and made faintly alkaline with a few drops of dilute ammonia; the water, previous to dissolving the hypo, was boiled so as to expel dissolved air. The glass tube was then drawn out and by means of a small funnel filled with the hypo solution as soon

* Concluded from page 9.

as it was cold, the remainder being transferred to a beaker, in which were placed the other pieces of paper. The printed paper placed in the beaker was, at the end of four days, completely changed in colour, the greater portion of the density was gone, and, though the paper has now been in the same solution for twenty-five days, no further change has taken place. The discolouration of the paper commenced at the water line in the case of a piece which had a corner projecting above the solution of the hypo; the paper sealed in the tube so as to exclude air is, to all appearances, still of the same density and colour as when originally placed in the solution. In the case of the paper immersed in hypo in the beaker and exposed to air, the bulk of the silver seems to be in the hypo, as, on testing with ammonium sulphide, distinct evidence of the presence of silver was found. It is not possible to determine the quantity that is left in the paper and that which goes into solution, as the quantity of silver on a half-plate sheet of paper is too small for an accurate analysis. From this experiment we conclude that access of air is a necessary condition for the change of colour of the silver image and its solution in hypo-sulphite of soda.

The next point we endeavoured to clear up was whether, by bubbling air through hypo pure and simple, and then immersing a silver image in it, the action would go on at the same rate, or whether it was necessary for the silver to be present at the same time as the air was bubbled through.

For this purpose air was passed through a solution of hypo, nearly saturated, for twenty hours; then (1) a strip of a graduated lantern plate was placed in it, and the tube sealed; another portion of the original hypo was placed in a glass tube of the accompanying shape,



Method of bubbling air through hypo solution containing silver image.

together with (2) a strip of the same lantern plate, and air bubbled through for twenty hours; a third strip was sealed in a tube, air having been previously driven out of the water by boiling. The original lantern plate was exposed, so that there were six tints on it, each succeeding tint in the direction of increased opacity being exposed twice as long as the one preceding.

In the case of (1), at the end of nine days, tint No. 5 was as dense as tint No. 4 on the original plate, a slight change in colour accompanying the reduction in density, thus showing that the dissolved air had produced a certain effect in reducing the density and altering the colour.

(2)—In this case, at the end of four hours, tint No. 6 corresponded in density to tint No. 3, at the end of eight hours it equalled No. 1, and at the end of the period above stated, twenty hours, the density was completely gone, and only a yellow stain left in the gelatine, the different gradations being still visible on the plate when placed on a sheet of white paper.

(3)—This portion of the plate, though sealed in the same strength of hypo for the same time as in the previous experiments, viz., nine days, has not altered in the least; the only difference, in this case, being that the solution of hypo was, as nearly as possible, air free. These experiments point conclusively to the necessity of air being present, in order to bring about a rapid change in density and solution of the silver.

The above experiments show that a silver image may or may not be attacked when left in hypo of any strength, depending upon the circumstances at and during the time of immersion. In the experiments made by Mr. T. C. White, his films and silver were contained, respectively, in microscopic cells, and a test tube; in neither case had air free access, and it was in consequence of this that he noticed no change in the density of the film, and but little loss in the quantity of silver contained in the test tube.

In the experiments carried out by Mr. Sexton, though it is not stated, yet one may assume that the strips of paper were immersed in a horizontal dish containing hypo, to which air had free access; under these circumstances we should now expect a tolerably rapid change in colour and solution of the silver image.

With regard to Mr. Albert Levy's conclusion, we must say, from what we now know, that a photographic image cannot be appreciably reduced in the short time that it is immersed in hypo in order to ensure complete fixation. The experiment made with the mixture of metallic silver and silver bromide tends to prove this; also the experiment made with a developed plate, which was immersed for twenty minutes, being tested photometrically both before and after treatment, and which showed no difference in density. It is a fact well known to photographers that, if, after a plate has been developed and fixed, it is exposed to the air for a short time, instead of being washed, that the density becomes less; and that, if the image on removal from the hypo bath was black, after exposure it changes to a yellowish brown, which colour no after treatment with ordinary clearing solutions will remove. Here we have just those conditions which are best suited for attacking and dissolving the silver image. If the plate had been left in the hypo for the same length of time that it was exposed to the air after it had been fixed, no such reduction would have taken place. In the first case the hypo is exposed to the air in a thin stratum and in contact with the silver, and thus the air is able to act with much greater rapidity than when it has to penetrate a thick layer of hypo solution.

In examining the silver deposits on the gelatino-bromide plates which had been acted on by air and hypo, we were struck by the deep yellowish brown colour of the remaining silver, which was very different to its original black colour, and it appeared probable that as the hypo required the aid of air to effect the solution of the silver, this yellowish deposit was not metallic silver, but either a mixture of silver and silver sulphide or an oxysulphur compound; and, in order to investigate this point, we prepared some pure metallic silver and subjected this to the action of the hypo and air. Pure silver nitrate was taken, precipitated by means of ferrous sulphate, and the reduced silver boiled half a dozen times with dilute sulphuric acid, then with distilled water, and then treated with moderately strong ammonia to dissolve any soluble silver compounds, and finally washed six or seven times with distilled water, dried at 100° C., and placed in a stoppered bottle.

A portion of this was placed in the apparatus already described (fig. 2) and subjected to the action of hyposulphite of soda and air. At the end of two hours a slight change was visible in the colour of the metal, and at the end of fifty-seven hours it had changed to a dark reddish-brown. The action was then stopped, and the altered silver filtered off from the hyposulphite of soda solution, washed, and dried. The filtrate and washings were then treated with sulphide of ammonium in order to estimate the amount of silver that had gone into solution. This was found to amount to ·0420 grammes of silver. The reddish-brown body, which was found to weigh 1·7598 grammes, was then dissolved in dilute nitric acid and the silver precipitated with hydrochloric acid, filtered off, washed, and dried. On weighing this it was found to equal 1·7527 grammes of silver. The filtrate from the silver chloride was then taken down to dryness, with the addition of a little sodium carbonate on a water bath, hydrochloric acid added, and again taken down to dryness in order to get rid of the nitric acid. It was then taken up with water acidulated with hydrochloric acid, and, after being heated to the boiling point, precipitated with barium chloride, and the barium sulphate formed estimated in the usual way. This was found on

weighing to be equal to ·003 grammes of sulphur. Calculating from these figures the composition of the original compound, we get—

Silver	99·58	per cent.
Sulphur	·17	„
Oxygen (by difference)	·25	„
	100·00	

The amount of silver in solution was equal to 2·33 per cent. of the original silver taken.

The fact that silver is soluble in hypo in the presence of air has not been, we believe, observed previously, and we have made a few experiments in order to ascertain, if possible, the reason.

It is well known that, if a silver salt be dissolved, even in a large excess of hypo, it will after a time deposit silver sulphide in the form of a deep black precipitate, and it seemed probable that, if we heated together metallic silver with pure hyposulphite of soda, we should obtain silver sulphide and sodium sulphite. This was carried out by sealing in a glass tube some pure metallic silver and pure hypo, and heating the whole in a water bath to 100° C. When the tube was opened after boiling for five hours, the silver was quite black, and, on testing, was found to have become partly converted into silver sulphide, and the solution, which was kindly examined for us by W. P. Bloxam, B.Sc., by the method he recently published in the *Chemical News* for the detection of sulphides, polysulphides, sulphites, thiosulphates, and sulphates in the presence of each other, was found to contain sodium sulphite. On testing the solution for silver, only the merest trace was detected.

What happens in a solution of hypo through which air is bubbled in the presence of metallic silver is that the metal attracts sulphur from the sodium hyposulphite and forms silver sulphide, and the presence of dissolved air oxidises the silver sulphide to silver sulphate, which goes into solution in the excess of hypo.

We offer this as a possible explanation, subject to the correction of further experiments which we are now proceeding with, and we hope at some future date to communicate the results in a second paper.

A. Haddon,
F. B. Grundy.

THE SWELLING OF PHOTOGRAPHIC GELATINES.

It is known that a piece of gelatine soaked in water will take up a certain quantity and swell, says R. Ed. Liesegang, in the *Photographisches Archiv*. The so-called "hard" gelatines absorb less proportionately, and the "soft" more. Alum and other tanning substances bring gelatines into the harder condition.

These substances are therefore used to give photographic films sufficient capacity for resistance. The following also happens, to a certain extent. Let, for example, a commercial dry plate be soaked in water, it will take up much less than will a piece of pure gelatine of the same size, in the same time. More especially is this observable if we wish to remove the films from spoilt plates.

If, however, the same dry plate had been first developed and fixed, the swelling in the washing water would have been much greater. The susceptibility to mechanical pressure is increased. The film eventually becomes detached at the edges, &c. This can be referred partly to the influence of the developer, which, if strongly alkaline, has a softening effect. But the greater swelling capacity is also present, if development be effected with amidol or ferrous oxalate, which contain no alkali. Moreover, the swelling does not generally appear in development, but ultimately in the washing after fixing. This points to the fact, that the swelling of the film may be caused by other means than the softening compounds of the developer. Whilst the plate remains in the fixing bath, the effect does not appear. Usually the relief first becomes visible in pyro-developed negatives after they have been fixed and washed.

My researches respecting the formation of blisters on dry plates (vid *Photographisches Archiv*, 1895, p. 321) led me to make an experiment, which elucidates these peculiar phenomena of swelling.

Soak one corner of a bromide plate in a twenty per cent. solution of hyposulphite of soda, and another corner of the same for an equal time in pure water, and it will be observed that both parts have swollen equally. Now soak the entire plate in pure water, and the whole surface will become equally swollen, excepting the corner that has been treated with hyposulphite of soda, which is in much greater relief. The greater absorption of water at this spot is, moreover, very noticeable if, after thorough removal of the salt by washing, the plate is dried. The corner remains damp twice as long as the rest of the plate.

This peculiarity is not confined exclusively to hyposulphite of soda. If a portion of the plate is first treated with chloride of sodium or bromide of potassium, those parts swell more, similarly. Even treated with a powerful tanning substance—chrome alum—the parts appeared first in greater relief than where they had been simply washed; but, after prolonged action, the tanning effect asserted itself, and those parts again contracted.

Salts in solution therefore play an important part in the greater swelling of gelatine. But how? A direct softening does not occur. The modern physicist will fly to the theory of osmose, and explain that salts diffuse themselves through the film of gelatine, and pass into the water more slowly than the pure water penetrates the film. I prefer, myself, another explanation, which I should also like to apply to many other so-called osmotic processes.

It is not only the difference in rapidity of diffusion which brings about the pronounced swelling. The attraction of the surrounding water, by the concentrated solution of the salt in the gelatine, has much more effect. As this solution does not diffuse itself outwards with sufficient rapidity, the gelatine must yield. *The salt consequently presses the water into it.* If the gelatine cannot yield because it has been too strongly tanned, blisters arise, as described by me a short time ago.

The following facts are thus explained:—

(*a*) Why a finished negative, which has been once dried, seems to be much harder than one which has just been finished. It no longer contains any salts that could make the film swell more.

(*b*) Why printing-out gelatine papers cannot be hardened as much as development papers.

(*c*) The occurrence of blisters.

The following may also be inferred:—

(*a*) That the gelatine film swells less if weaker fixing solutions are used, or if salts in weak solution are used between fixing and washing.

(*b*) That plates or papers may be freed from hyposulphite of soda rather more quickly by a succession of baths—for instance, by introducing a salt in weak solution, or by using a more dilute fixing bath. The gelatine will then swell less, and consequently retain less of the solution.

(*c*) A few hints for the collotype process, to which I may refer more closely on a future occasion.

(*d*) Besides the interest this may have for photographers, there are the inferences physicists and biologists may draw therefrom in their departments.

ON THE PRINTING OF SINGLE FIGURES IN GROUP NEGATIVES.

I.

Of the many and varied commissions a professional photographer finds himself called upon to execute, perhaps there is none which he undertakes with more reluctance than that of abstracting some particular figure which is contained in a group negative, and which it is desired should be so enlarged as to form a cabinet picture by itself.

An operation of this kind will frequently be found to entail a good deal of careful manipulation, and at the same time take up a good deal of time in accomplishing, when the work necessitates the removal of the original background and the substitution of another and more suitable one for the same.

No doubt, in the majority of cases where groups are being dealt with, it will be found that, in nine cases out of ten, such have been photographed in the open air, and, as a consequence of this, very many of the sitters will be found posed with their hats or bonnets on: others, again, will be found who invariably prefer to remove such, even when being photographed in outside situations. In cases where the figures are found wearing their hats or bonnets, it may

frequently happen that advantage may be taken of the existing background, in which case the operation is performed with much less trouble than in cases where such has to be got rid of and another substituted.

The nature and suitability of the background is undoubtedly the main factor that has to be considered when undertaking work of this kind.

In instances where any figure is so posed that a reasonable amount of space is found to encircle the head and shoulders, and where the next figure in the group does not overlap in such a manner as to obstruct the head of the figure it is desired to operate, upon either in front or behind, the entire operation is easily and rapidly performed by treating that portion of the negative alone which contains the head and shoulders as an ordinary operation of enlarging would be executed on a single head picture. In the one case, however, recourse must be had to some method of blocking out or vignetting off all the surrounding figures, in such a manner that they will be entirely invisible in the resulting photograph. Much will at all times depend upon the space that intervenes between the figures in the original negatives in determining as to whether the operation should be conducted by vignetting or blocking off; the latter is undoubtedly the most easy of accomplishments, although any one who has never had such a job to perform would, no doubt, hardly consider this to be the case.

A very common example of this kind is where, say, a half-inch head, with hat and a fair amount of bust, is free to be worked upon without any objectionable background. In order to enlarge such to a reasonable extent, so as to form a pleasing cabinet picture, the simplest method to follow is to surround the head and shoulders with a small oval mask of a suitable size and shape, and then, by blocking out by means of black paper on the glass side of the negative all the rest of the original, the operation is very easily accomplished by simply enlarging the now masked-out head directly on to any desired sensitive support. To those who may say, "Oh, yes; but how are you to get an oval mask of such small and exactly suitable dimensions to enable this work being performed so easily?" To such, no doubt, this method would seem to offer insuperable difficulties; but, in reality, such is easily provided once any one knows how to set about making it. To cut a small oval mask is not a feat that requires much pains or trouble; but there is another way of making them with the greatest ease, and it is a method quite within the scope of any photographer. Here is how to set about it. Every professional will have beside him a few cut out—whole-plate or other sizes of masks—if not, for a trifling sum he can acquire such from any dealer. Along with these cut-out masks the makers supply the cuts-out or centre discs which correspond to the shape and size of the masks. Let any one desirous of making, say, a small oval-shape mask, of about one inch in size or any other dimensions, take one of these cuts-out, and, by attaching it to a white card or sheet of opal, let him proceed to photograph this black shape to the exact size he wants his little oval to assume. There is certainly no great trouble in doing a job of this kind. In photographing this, sufficient density may be gained by development and after intensification of the negative so produced, provided the operator knows how to make black-and-white negatives; if not, the sooner he learns the better. If it be found that sufficient contrast has not been gained, i.e., the centre does not appear as absolute clear glass and the blacks so dense as a candle flame is hardly perceptible through the opacity at a distance of eighteen inches from the flame, then the operation has not been skilfully performed, and, as I have said, the operator should learn how to do work of this kind, for in these days of line and half-tone process blocks, a thorough knowledge of black-and white working on a photographer's part is an absolute essential to success.

Should it, however, be found that sufficient density has not been gained, then there is no great difficulty in tracing the form of the oval with a good sable or camel's-hair pencil charged with a good black pigment. This will at all times give the desired opacity. Having provided the mask, which is nothing more nor less than a negative image of the block cut out and the white card, let this be placed in position over the head and bust of the figure it is desired to abstract. This is best done on the glass side, by simply attaching it to the desired spot by means of strips of gum paper. One of these cuts-out is a very handy key to keep in stock in the manner I have indicated, and for this reason, that any size of oval, either large or small, is easily produced, by photographing it in the manner I have described.

Should it be desired to print the head by means of one or other of the modern excellent platino-bromide papers which are now so deservedly popular, then a dozen or so copies are easily pulled off by means of placing the negative in the copying box, and making a small enlargement by daylight after any of the approved methods. When the operation is gone about in this manner, very excellent results are rapidly produced. Should it, on the other hand, be desired to print the picture on a less suitable medium, such as albumenised or other printing-out papers, then it becomes a more roundabout operation, and necessitates the making of an enlarged duplicate negative by any of the most convenient methods. These platino-bromide prints, however, are very easily worked up in black-and-white by those having a little experience at this branch of work, and with a reasonable amount of care in exposing and development exactly similar proofs are easily obtained.

It is not in every case, however, that an oval shape will be found to suit the requirements of the particular head being dealt with. Sometimes, owing to the nature of the surroundings in the original negative, other shapes, such as rounds or squares, will be found more suitable to adopt, for the purpose of stopping out those portions not desired. The cutting of a very small round mask is also easily performed, once an operator knows how to do it; but there is also in this case a far simpler way of providing a round aperture to encircle the head, and it is so ridiculously easy to do, that no doubt many will smile when they read the remarks which I now pen.

Suppose any one wants a small round mask of, say, half, three-quarters, or one inch in size: all he has to do is to take for this temporary purpose one of his stops. This is easily gummed on the negative in the same manner as I have described. Necessity is the mother of invention, and I hit on this dodge one day when I needed a three-quarter inch round badly. I can assure the readers of The British Journal of Photography that any of their stops will be found useful for this purpose; in fact, they are the very things required. Squares or oblongs are quite as easily provided, and sometimes such will be found more suitable than either ovals or rounds; all will depend on the nature of the backgrounds and the surroundings of the figure.

In cases where it is desired to furnish a vignetted head, the operation entails considerably more trouble, particulars of which I hope to give in my next article.

T. N. Armstrong.

CLOUD PHOTOGRAPHY.*

[Nature.]

The blue colour of the sky has as much action on an ordinary sensitive plate as the white colour of light clouds (cirrus and cirro-cumulus); it is therefore necessary to diminish the action of the blue background of the sky. For this purpose a yellow screen is placed so as to intercept the rays; the light coming from the sky contains very few yellow and green rays, and is thus extinguished to a great extent; but, on the other hand, the great proportion of yellow and green rays which exists in the white light of the clouds passes the screen and makes an impression on the plate, if it has been made more sensitive to the action of yellow and green rays than the ordinary plates.

There are, therefore, three points to be considered: (1) the coloured screens; (2) the sensitive plate; (3) the method of development of the images.

(1) The Coloured Screens.

Coloured screens formed of films of gelatine or collodion must be rejected, because their tint changes very quickly in the light, and they easily lose their transparency. Either yellow glass must be used, or cells containing a suitable liquid.

Yellow glasses make the most convenient screens of all; but the difficulty is to find suitable glasses which are always the same, and of sufficiently graduated shade. Some are excellent, others not worth anything. Before recommending the use of coloured glasses exclusively, some experiments ought to be made with the help of a glass-maker, in order to ascertain what ought to be the exact composition of the glass so that it may be reproduced with the exact tone at any time. It is unnecessary to add that the glass must be homogeneous and polished with quite parallel surfaces; only glass ought to be used which is coloured in mass, and not white covered with a superficial layer of enamel.

The surest method, in the case of not being able to get glass of which the composition is known, would be to use liquid screens, as I do. They are made with two parallel square glasses cemented together on three sides by square glass rods also with parallel sides, and with a thickness of six or seven millimetres, and length of side seven to eight centimetres, one side remaining open. If one does not wish to go to the trouble of

* Translated from *Cosmos*, November 23, 1895.

making them, these cells can be obtained from instrument-makers. Needless to say that, before cementing, the glasses must be carefully cleaned with a solution of carbonate of soda, then with water, and lastly by being well rubbed with a piece of cotton-wool dipped in alcohol; with these precautions, no air is to be feared along the sides of the cells. Before introducing the liquid, care must be taken to dip the open end of the cell in a bath of resin (a mixture of yellow wax and resin of equal parts). For ultimately closing the cell, it suffices to fasten on the edges, thus covered with resin, a little plate of glass cut to a suitable size, and which must be heated on a plate of copper to prevent its breaking. If found desirable, the aperture may be still more securely closed with sealing-wax. Thus cells are obtained hermetically sealed, which can be used at every inclination without the liquid spilling and without air getting along the joints.

The easiest way of fixing these cells in position is to pierce a circular hole in the centre of a flat piece of cork, the size of the sunshade of the lens of the camera. The plate is fitted into the sunshade and held by indiarubber. The screen is thus in front of the lens, and it can be easily replaced by others more or less dark.

For the liquid I have had to reject all solutions of organic colours, such as aurantia, primuline, chrysoidine, for they alter in the light. The simplest one is to use the bichromate of potash. A saturated solution is prepared at ordinary temperature, to which is added, after straining, a few drops of hydrochloric acid. This saturated solution, introduced into one of the previously described cells, constitutes screen (1), which should be used when the clouds are very light, and the sky of a pale blue. A solution of half the strength forms screen (2), which may be used for well-lighted detached cirrus on a really blue sky; lastly, screen (3), consisting of one part of the saturated solution to three of water, should be reserved for very luminous clouds as cumulus and cumulo-nimbus.

It is certainly more convenient and more simple to use coloured glasses as screens; but, while there is a doubt as to finding suitable glass, we can always be certain when using bichromate cells of straightway obtaining excellent screens, always precisely the same. The ones I possess have been in use two years, and no precautions have been taken to preserve them.

(2) Sensitive Plates.

Special plates must be used for yellow light. The way of preparing these plates by means of ordinary plates is already well known; I did this at first. But I am certain that the necessity of preparing the plates is the principal obstacle which stops people taking photographs of clouds who are really desirous of doing so. However, prepared plates are to be had in the trade, and they serve the purpose admirably.

Among the types of plates called orthochromatic or isochromatic, two have given me excellent results: Lumière's orthochromatic plates, sensitive to yellow and green light, and Edwards's orthochromatic plates.

There is, therefore, no necessity to prepare plates, as they are to be had ready-made, and at least, in most cases, quite as good as those one could prepare personally. It has been said that the sensitiveness of these plates alters very soon, so much so that they are useless at the end of a few months. With regard to this, I can but quote the following fact. In February 1893, I received from the firm of Lumière three boxes of orthochromatic plates, of which the date of manufacture is unknown to me. These three boxes were simply placed in a cupboard of my bureau without any other precautions. The first box of twelve plates was used in the course of 1893, the second only opened at the beginning of 1894, and used between the months of March and November; lastly, the third box was opened only in November 1894, and the two first plates gave negatives which did not differ at all from those obtained from similar plates twenty months before.

Other similar boxes opened, then forgotten for some months in a cupboard, have always given me excellent results.

I intend to continue these studies; but it seems to me now established that, if the sensitiveness of these plates diminishes with time, this diminution is small enough to permit of the plates being used after more than eighteen months. Under these conditions nothing can be said against their use.

Focussing is done without any difficulty on a distant object—for instance, on a house in bright light. If the horizon is not far enough distant, an object can be taken comparatively near (at least twenty-five or thirty metres); then, in order that the position shall correspond with infinity, move the ground glass towards the lens a distance $\frac{f}{k-1}$, f being the focal distance of the lens, and k the number of times that the distance of the object which has been focussed contains the focal length of the lens. For instance, if an object twenty metres distant has been focussed with a lens of which the focal length is twenty-five centimetres, then we get $k = \frac{2000}{25} = 80$. In order that the clouds may be in focus, the ground glass must be brought a distance of $\frac{25}{79} = 0{\cdot}32$ cm., about three millimetres, nearer the lens. Of course, the focus must be got with the coloured screen, and the position thus found must be marked on the base of the camera, in order that the position of the frame may be known.

(3) Development.

No mode of development must be rejected *à priori*; even developers called *automatic*, which can be bought ready-prepared, and which have been very much run down, for they are by far the most convenient, and often give excellent results.

If the negative that we wish to develop contains only clouds of more or less the same intensity, the automatic developers may be used without any risk. I have used baths of hydroquinone, Lumière's developer (of para-amidophenol), &c. with success. It is advantageous to use baths which have already been used, and consequently containing a good proportion of bromide; a greater contrast is then obtained between the clouds and sky, and the development can be carried further without fear of fogging.

If, on the contrary, the negative consists of clouds of very unequal luminous intensity, as, for instance, delicate cirrus and strongly lighted cumulus, the negative would not turn out well with automatic developers containing much bromide; the image of the cumulus would appear, and be over-developed, before that of the cirrus had begun to show itself. In this case either a new bath must be used, very diluted, without bromide, and the development is then very slow, or else (which is preferable) use pyrogallic acid, in employing the method recommended by M. Londe. In this case the development must be commenced with a very small quantity of pyrogallic acid, a little bromide, and relatively enough carbonate of soda, in such a way as to make all the parts of the image appear at first, without much intensity; then the necessary intensity will be obtained, little by little, by the successive additions of pyrogallic acid. It is in this case only, where the intensity of the clouds is very different, that I think it advantageous to recommend progressive development instead of pyrogallic acid. In most ordinary cases, however, the automatic developers, which are more rapid, and more convenient to use, act very well.

In fact, it is always as well to continue the development till the image is sufficiently dense, without intensifying, which is almost always possible. Negatives ought only very exceptionally to be intensified; to my mind, the intensification is always bad, it spoils the detail; a renewed or feeble negative is never worth as much as one that was made sufficiently dense in the first instance.

If I have gone into all these details, it is only to show that photography of clouds is a very easy operation, and within the reach of all amateurs. And let me just add that, with the darkest screen (saturated bichromate) and Prazmowski's lens, with a focus of 160 millimetres, and diaphragm of $\frac{1}{30}$, I obtain negatives with a maximum exposure of six seconds for cirrus, with an ordinary amount of light with a Zeiss object-glass, a diaphragm of $\frac{1}{15}$ and very bright cirrus, having an exposure of $\frac{1}{30}$ of a second, has sometimes been more than sufficient, even too much.

It would be very interesting if amateurs in photography, so numerous at the present time, would try to photograph clouds which strike them as having interesting shapes, noting with care the hour when they were taken, and also the direction in which the clouds appeared.

LANTERN SLIDES AND THEIR MAKING.

At the meeting of the Brixton and Clapham Camera Club, held at Brixton Hall on Tuesday, January 14, the President, Mr. J. W. Coade, in the chair, a large number of the members and friends were in attendance, the fixture being *Lantern Slides and their Making*, by Mr. E. Dookree. The lecturer, in his opening remarks, pointed out the fallacy of attempting to proffer practical information to those present by the development of a lantern slide, as only those near the object itself would be able to gain any knowledge by his manipulations; he therefore proposed to touch as concisely as possible on all the technicalities of making a slide, from the negative to be chosen to the binding of the finished slide, concluding his remarks by projecting on the screen magnificent slides by some of the best-known workers of the day. Continuing, he touched upon the two methods of making a slide, viz., reduction and contact, of which he always preferred the former, averring there was always an indescribable

something about a picture obtained by reduction, not obtained by contact printing. The camera he used was one of Griffiths' fixed focus, fitted with a Taylor, Taylor, & Hobson lens, altering the aperture of the same as circumstances required. The class of negative which gave the finest result in his hands was that of a soft but vigorous class, in fact that which would yield a good platinum print, was first class for slides and developed to that end. The lecturer then handed some six half-plate negatives, bound up with ground glass, round for the inspection of those present, touched briefly upon the processes—albumen, collodio-bromide, and chloride, carbon, and gelatino-bromide and chloride, saying he had found it possible to obtain all he required on a gelatino-bromide (slow) plate—giving the preference to Paget's, by reduction. Proceeding to give the formula of the Paget developer and times of exposure according to the light available, he said, after a little experience the tone required by the manipulator was easily obtained, judicious use of bromide of ammonium being a most important point, tones ranging from velvet blacks to purple and red varying according to the exposure and restrained development. The advantage of a slight veiling of the slide was shown, adding a softness to the resulting picture when projected on the screen. Should intensification be deemed necessary, he invariably used that of Mr. Boothroyd's formula, and published by Messrs. Cadett & Neal, in the November 1894 number of their *Dry Plates*. It is possible by this intensifier to build up a ghost of an image into a very fine slide. It is as follows:—

A.

Pyro	6 grains.
Citric acid	15 ,,
Water	1 ounce.

B.

Silver nitrate	30 grains.
Water	1 ounce.

Distilled water should be used, or milkiness of solution will result.

For use, take sufficient of A to cover plate, and add to it two or three drops of B. But the plates must be absolutely freed from all hypo by washing, or stains will result. Before binding up a slide, varnishing is recommended, that composed of amber dissolved in chloroform being the best as it dries immediately, and also forms a very fine tooth should retouching be necessary. As regards masking, he strongly pointed out that as much care is required as would be bestowed on the shaping of a print, square corners, except in portrait, photo-micrographic, or flower studies being essential for a good appearance on the screen. He always made his own masks out of the thin, opaque, black paper in which the lantern plates were wrapped. By making them himself, he obtained "real square corners." Spotting, binding, and titling being unnecessary to go into, Mr. Dockree concluded by mentioning the following points. It was as possible to obtain an artistic result by photography in a lantern slide as on paper, notwithstanding what had been said to the contrary by those who excelled in the one branch and not in the other, as the audience would see by the specimens projected on the screen later on. Let the worker's watchwords be "detail first, density afterwards," which, combined with good technique and an "artistic composition" in the negative, the result would be pleasing to the most critical. After an animated discussion, in which the demonstrator explained points which he had not touched upon, such as brush development and the great advantages obtained by a judicious use of ferridcyanide of potassium, printing in clouds, either on cover glass or subject glass, &c., some magnificent specimens of slide work by such well-known workers as Messrs. J. Hankins, J. H. Gear, Edgar Lee, and E. R. Ashton, were projected on to the screen, and met with the applause they so richly deserved.

THE BIRMINGHAM AND MIDLAND INSTITUTE
CONVERSAZIONE.

This annual *conversazione* is probably one of the most successful held out of London, and is attended by very large numbers of the inhabitants of Birmingham and district, and, besides the attractions held out by numerous scientific exhibits, there is dancing every night, and an opera by some of the principal amateurs of Birmingham, who this year chose the *Pirates of Penzance*.

The photographic exhibits included a very fine series of prints of Warwickshire windmills by Messrs. E. C. Middleton and Harold Baker, which have been made in connexion with the photographic survey of Warwickshire. The diversity of shape of the windmills was extraordinary, and, although they could hardly be said to be artistic, they attracted a good deal of attention and the interest of archæological students.

Mr. Charles Pumphrey showed some stereoscopic slides of compound curved lines, drawn by machines, which were not only pretty, but exceedingly delusive, the lines looking like so many solid wires interwoven in the most intricate patterns.

The tintometer, which was shown by Mr. E. J. Wall, is used for analysing colours of all kinds, and is, we learn, to be applied to the reading of the speed of plates and the printing powers of negatives, some work already having been done on these lines.

The incandescent gaslight has before now been applied to artificial light portraiture, and Mr. J. W. Beaufort, of Colmore-row Birmingham, had one of Best's patent Beaufort lights fitted up on a stand in one of the rooms. This light consists of a cluster of nine incandescent gas lamps, without chimneys, arranged under a parabolic metal reflector, lined inside with white asbestos, the whole being swung on a weighted and pivoted arm, so as to be adjustable in every direction. The consumption of gas is by no means heavy, and complete control of the lighting is obtainable, the exposure for an ordinary bust portrait being about two or three seconds.

Dr. Hall Edwards' exhibit, whilst including some stereo-photo-micrographs by Mr. Iles, and some lantern slides chemically coloured by glaucotone, mounted by Mr. Iles, which certainly produces the most wonderful tones on commercial lantern plates, ranging from pale pink through every shade of colour to deep black brown, consisted mainly of some marvellous figures, produced in the form of lantern slides, which illustrated the forces of cohesion, adhesion, and diffusion. Every evening too, were projected on a screen, by means of an electric lantern (specially lent by Messrs. W. Watson & Son, of Holborn) the formation of coloured figures by means of various dye solutions.

The Aerograph or Fountain air brush was also shown by Mr. Chas. Burdick, and the results, produced by means of this instrument, in water colours were much admired.

The general exhibits included the application of the Milver portable batteries to electric lighting and motor carriages. Microscopes with various interesting subjects, under ordinary and polarised light, also drew large numbers, and the sound generators invented by Mr. Gould, of Nottingham, drove many out of the room in which they were exhibited, by the terrible volume of sound they generated. They consist of steel bars of various thicknesses and length, and which were excited by vibrating rubbers on flexible steel rods, producing notes of remarkable purity and volume, and in which the sound waves were distinctly heard and felt by a sensitive ear. One of the most generally attractive exhibits was the living ants shown by Mr. Henry Burns, who, at intervals, gave interesting details of their mode of life, &c., and who excited considerable surprise by making an ant hold a sixpence and rather heavy pencil case with its mandibles.

ALLEGED SHAM PHOTOGRAPHERS.

On Tuesday, January 14, at the Bristol Police-court, Messrs. Alfred Robinson and W. H. Budgett dealt with an adjourned case in which John Saunders, of respectable appearance, and his son, John Saunders, were charged with obtaining various sums of money by false pretences, there being seven charges in all.

Mr. H. H. Gore, who prosecuted, stated that since the end of September or early part of October last the prisoners had been carrying on business as photographers, of 2, Melville-terrace, North-street, Bedminster. They took a number of photographs of houses in different parts of Bristol, including, he believed, that of Mr. Budgett. (Laughter.) Early in November they began a course of systematic frauds. In one case the elder prisoner called at 25, Great George-street, the residence of Archdeacon Robeson, and, having asked permission to photograph the house, he suggested to the servants that they should appear in the view. This was done, and the prisoner, after making a pretence of taking the photograph, induced the servants to pay him 10*s.* for copies which he promised them. Afterwards the prisoner visited the Deaf and Dumb Institution, and, after taking a photograph of that building, with the children in front, he obtained 6*s.* from the Superintendent by promising copies. In the same way he obtained small sums of money at Stanhope House Industrial School, at Carlton Industrial School, and at Park-row Industrial School. But the cruellest case of all was at St. Raphael's Almshouse, the inmates of which had no money except trifles given them by visitors. Going there, the elder prisoner induced the poor old folk to borrow 1*s.* each to pay for copies of a photograph which he promised and pretended to take. In most cases the loss had fallen upon people who could ill afford to be defrauded. Although the prisoner, when making a call, pretended to make an entry of the order, the pages of the book in which he appeared to do so were covered more or less with scribble marks indicating nothing at all, and obviously a mere pretence of writing. Mr. Gore concluded by saying that, if he satisfied the Bench that there was not a *bonâ fide* entry with regard to any one of the seven cases on the charge sheet, he should submit it was evidence that he did not mean to carry the orders into effect.

The evidence given by Elizabeth Mutlow, in the Archdeacon's service, was read over. In reply to further questions, she stated that on Sunday, January 5, the day on which the elder prisoner was arrested, his son came to 25, Great George-street, and wanted to take a photograph, saying the one taken in November had been lost. She paid the elder prisoner 10*s.* in November. On January 6 she told the younger prisoner he must come next day, and he took a photograph, in which none of the servants appeared as on the former occasion.

Louisa Richards, also in service at 25, Great George-street, gave corroborative evidence.

Catherine Macfarlane, matron at Carlton House School, said the prisoner called there on November 21, and said he had come to take a photograph of the house for an architect's society in London. It was arranged, on the suggestion of the prisoner, that the children should sit

in front, and the prisoner made a pretence of taking a photograph. Afterwards she gave him 1*s.* 6*d.* for a copy, which he promised, but she would not advance 10*s.* or 10*s.* 6*d.*, which he wanted to pay for copies for several of the girls. She never received the photograph.

Annie Williams, laundry mistress at Carlton House School, said she also paid 1*s.* 6*d.* for a photograph, which she never received. The prisoner pretended to write the order in the book produced.

Similar evidence was given by Isabel White, assistant teacher at Carlton House.

William Barnes Smith, master of the Deaf and Dumb Institution, deposed that on November 9 the elder prisoner asked for permission to take a photograph of the building, and it was arranged that the children should be included. Witness thought the man took the photograph in a slipshod way, and suggested that he should take another, but the prisoner replied that it was a very good one. He paid 6*s.* for copies, but never received them. About a week after the prisoner's visit witness received a postcard from him, saying the photograph, which should have been completed by that time, was not satisfactory. Witness asked for his money back, but did not get it.

The elder prisoner said it was true that the negative was not satisfactory. It was taken with real apparatus.

Edwin Chaffey, headmaster of Park-row Industrial School, said the prisoner visited that place as he had called at others, and obtained 4*s.* 3*d.* The prisoner pretended to write something in his book.

Fanny Chandler, matron of Stanhope House School, said she paid the prisoner 10*s.*, and he appeared to enter the order. About a fortnight later the younger prisoner called, and, in connexion with a complaint by her with reference to his father, he stated that the weather had been unfavourable for the printing.

Thomas Chamberlain, an inmate of St. Raphael's Almshouse, said he was induced to borrow 1*s.* to pay to the prisoner. He called at the prisoner's house two or three times, but could not get the photographs

Mary Cogswell, of 25, Somerset street, Kingsdown, said she paid 7*s.* for photographs of the outside and of the inside of her premises.

The prisoner stated that he had a negative of the St. Raphael Almshouse, and it was produced. He added that a photographer could not be held responsible for bad negatives.

Detective Perry said it was the only negative in the case that was produced.

The case was adjourned, the prosecution intimating that other charges would be entered against both prisoners.

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PROSECUTION UNDER THE PHARMACY ACT.

THE Pharmaceutical Society, of 67, Lower Mount-street, Dublin, were the complainants, and the defendants were Matthew Ballantine and James C. Carson, proprietors of the firm of, and trading as "J. Lizars," of 73, Victoria-street, Belfast. There were three summonses in the case, in the first of which the defendants were charged with having, on October 7, last, sold a poison—bichloride of mercury—to Andrew Downey, the said Andrew Downey being a person unknown to them, and not having been introduced by a person known to them, contrary to the provisions of the Sale of Poisons (Ireland) Act, 33 and 34 Vic., cap. 26, sec. 2. In the second summons the defendants were charged with keeping open shop for retailing and dispensing poisons, they not being properly qualified under the Pharmacy Act (Ireland), 1875. In a third summons, the defendants were charged with selling and retailing and dispensing a poison on the day named.

Mr. S. Millin, barrister-at-law (instructed by Messrs. Galway & Clark) appeared for the plaintiffs, and Mr. E. J. Shaw (of Dinnen & Shaw, solicitors) appeared for the defendants.

Mr. Millin, in stating the case, said that there were three summonses against the defendants—for keeping open shop for retailing poisons, for selling a certain poison, and also for dispensing poisons, they not being properly qualified to do so. The principal Act was the Act of 1875, but that had been followed by the Amendment Act of 1890. Sections 15 and 17 of the Amendment Act of 1890 really contained the exact words of section 30 of the principal Act of 1875. Then, in 1893, section 30 of the principal Act of 1875 was repealed in part, because it had been already enacted in sections 15 and 17 of the Amendment Act of 1890. He would ask that an addition should be made to the summonses embracing these two sections of the Amendment Act, as he preferred to rely upon them.

Mr. Shaw objected to any amendment of or addition to the summonses. The Society had had three months within which to issue proper summons. He would ask their Worships to refuse to amend, and instead to give him a dismiss.

Mr. Nagle said, as the defendants did not seem to be damnified in any way by it, there was no reason why the addition should not be made.

The Bench then made the addition asked by the complainants.

Andrew Downey deposed that on October 7 last he purchased an ounce of pyrogallic acid, an ounce of sal-ammoniac acid, and an ounce of bichloride of mercury in the defendants' shop from a young man. He gave the bichloride of mercury to Mr. Templeton for analysis.

By Mr. Shaw: He told the young man that he wanted the bichloride of mercury for the purpose of intensifying negatives. He signed his name on the usual book as provided under the Poisons Act. He had a camera at home, and knew a little about photography. He purchased some bromide paper. He was instructed by the Society to purchase these articles.

Samuel Templeton, analytical chemist, said the article submitted to him was a deadly poison, and sufficient to kill the legal fraternity in Belfast. (Laughter.)

Mr. Millin said neither of the defendants were entered on the register of druggists and chemists.

Mr. Shaw submitted that no case had been made out. The defendants employed a registered druggist, and all the chemicals and poisons used for photographic purposes were under the control of Mr. Hogg, who, it was admitted, was a registered druggist. The summons charged them with having sold these articles to a person unknown to them, but, as a matter of fact, they knew he was employed by the Society.

Mr. Nagle: Is it admitted that the assistant is registered?

Mr. Millin: Yes.

Mr. Nagle said he would like to know on what basis Mr. Millin was going with his case.

Mr. Millin said his contention was that, if a person was himself registered, he could employ another, but that a non-registered person could not employ one who was registered.

Mr. Nagle: You have really a case, but the question is, Has the summons been properly framed?

Mr. Millin said the summons was framed under Section 30 of the Act of 1875. The section had been partially repealed, but re-enacted in Sections 15 and 17 of the Amendment Act of 1890.

Mr. Nagle said it was clear that the charge was not framed according to Sections 15 and 17 of the Act 1890.

Mr. Hogg said he was the manager for the defendants. He detailed the facts regarding the sale of the articles to Downey. When he asked for the bichloride of mercury witness said he supposed he was going to intensify negatives, and he said he was. Witness said he would require to be cautious, and he said he had used it dozens of times. He had seen Downey before this date, and knew that he was a servant of the Pharmaceutical Society.

To the Court: He knew that he was a servant of the Society before he wrote his name on the book.

Mr. Nagle said: On the whole evidence, the magistrates considered that the man was not known to the defendants strictly within the meaning of the Act of Parliament. They considered it really only a technical offence. A little more care would have obviated the difficulty. Under the circumstances they would make a nominal penalty in the first summons of 10*s.*

Mr. Milne said, if they considered it necessary to ask to have a case stated, they could apply within the three days allowed.

Mr. Nagle: Certainly.

Mr. Shaw asked to have the other two summonses dismissed with costs.

Mr. Nagle said they would not give costs.

LANTERN SLIDES OF CATHODIC PHOTOGRAPHS.

Last week we referred to the fact that, following on the lines laid down by Professor Röntgen, Mr. A. A. C. Swinton had succeeded in obtaining photographs by the agency of radiations from a Crookes tube through an ordinarily opaque body. These photographs were shown at the Camera Club meeting of Thursday, January 16, and excited much attention. We have since had an opportunity of examining the negatives. In the case of one—a negative of Mr. Swinton's hand—the bone structure is shown with remarkable effect. Other subjects are not less surprising as illustrating this new adaptation of photography.

Messrs. Newton & Co., of Fleet-street, are supplying lantern slides from Mr. Swinton's negatives, and, doubtless, many of our readers will be glad to avail themselves of the opportunity of studying these interesting subjects.

Our Editorial Table.

The Photographer's Miniature Annual.

By T. Bolas, F.I.C. London: Carter & Co., 5, Furnival-street, E.C.

This is a volume measuring 2¾ inches by 2 inches, which claims to supply the want of "a book which, while containing varied information, may be of such a size as to be carried in the pocket for handy reference at any time." If we are not misinformed, our own Almanac, in the early stages of its career, was the object of a like aim on the part of its compilers. The *Miniature Annual* contains 58 pp. of ably selected and condensed information, the few formulæ, tables, the calendar, and other information printed being such as one would look for and be glad to find in the book.

The London Photographic Supply Company's Price-list.

The Company, writing from 63, Great Dover-street, Borough, inform us that they send this Catalogue free to the trade. It is a book of about 260 pages, which recapitulates and illustrates the requirements, in great variety, of professional and amateur photographers.

Modern Magic Lanterns and their Management.

By R. Child Bayley. London: L. Upcott Gill, 170, Strand, W.C.

Mr. Child Bayley's little book is a complete and not too diffuse introductory guide to optical lantern work. As regards illuminants, oil and limelight are fully treated of, and the author, while rightly thinking it not worth while to say more of saturators than is demanded by the slight vogue they have obtained in practice, wisely includes chapters on home-made oxygen and the electric light—two subjects that are likely to interest the lanternist for a good while to come. The final chapters of the book are devoted to experimental work with the lantern, projection spectroscopy, polariscopy, and microscopy also coming in for descriptive treatment. This section, appearing in a work issued at the small price of 1s., will therefore be doubly welcome. The book throughout has been carefully and judgmatically compiled, and is calculated to be of great practical use to lanternists—beginners, or otherwise.

Photography and Architecture.

By E. M. Cosgreave. Bradford: Percy Lund & Co.

Mr. Cosgreave is an enthusiast in the photography of ecclesiastical architecture, and his booklet, the sub-title of which is, "How each lends interest to the other," contains forty-three illustrations from his architectural photographs. A few hints to the photographer contemplating this kind of work are given, and the various styles of church architecture are illustrated and described. It is an unpretentious, but, nevertheless, useful little book.

La Photographie durant l'Hiver.

By L. Mathet. Paris: Charles Mendel.

M. Mathet's work is directed to pointing out the great field photography offers for cultivation during the winter months, and incidentally it is a capital guide-book to the main subject, prominence, of course, being given to the influence which a fall in the temperature exercises on photographic economics. Collodion, as well as gelatine, work comes in for treatment.

The Grammar of Photo-engraving.

There is just now much demand for information relating to photo-reproduction processes, and this, no doubt, explains the importation of this work. It is, in fact, an American work, dealing, to quote the title-page, with "drawing, chemistry, and optics as applied to photo-engraving," and claiming to be "a practical treatise on the art of half-tone, zinc etching, swelled gelatine, lithotype, and chalk-plate engraving as practised in the United States." The book is replete with useful, and, so far as we have been able to gather, accurate information relating to photo-engraving, and as such will, doubtless, find its way to the studios of many process workers.

Pictorial Photographs: A Record of the Photographic Salon in Twenty Plates. Reproduced in Photogravure.

By W. L. Colls. London: Walter L. Colls, Castlenau-gardens, Barnes; or Kegan Paul & Co., Charing Cross-road.

This collection of photogravures, the work of Mr. W. L. Colls, has been happily chosen, as it includes examples of the various "schools" that contributed to the last Exhibition of the Salon, although possibly there is an unnecessary preponderance in favour of foreign workers. Among the twenty pictures selected for reproduction may be mentioned Henneberg's *At the Rushy Pool*, H. P. Robinson's *In Kilbrennan Sound*, Sutcliffe's *Fog*, Craig Annan's *A Little Princess*, Horsley Hinton's *Day's Decline*, Striglitz's *Scurrying Home*, Demachy's *Rouen*, &c. It goes without saying that Mr. Colls' photogravures are capitally done, and he has, in most cases, very successfully reproduced the colours of the originals. If we demur to the implied theory of the preface that modern pictorial photography is only to be dated from 1893, we none the less recognise this collection of pictures as one of which not only the Salon and Mr. Colls, but photography itself may be proud.

News and Notes.

Royal Photographic Society.—Technical Meeting, January 28. *Dr. Rudolph's Method of Lens-testing and some of his Results*, by Mr. J. H. Agar Baugh. *Stereo-micrographs with New Colour-tone Effects*, by Mr. Fred Iles.

We have to record the death, at Ilfracombe, of Mr. W. Harding Warner. The name of Mr. Warner will be familiar to many of the readers of this Journal and its Almanac, to both of which he was a frequent contributor. Essentially one of the old school in matters photographic, Mr. Warner was endowed with considerable ability.

Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening January 29. Travellers' Night. The *Avon Valley*, illustrated by lantern slides from negatives taken by the lecturer, Mr. Harold Baker, of Birmingham. Visitors are always welcomed by the members.

Leeds Photographic Society.—The first meeting of the new Committee was held at 12, East Parade, when the officers for the current year were elected as follows:—*President:* Mr. Peter Gilston, J.P., ex-Major.—*Vice-Presidents:* Messrs. John H. Walker and Herbert Denison.—*Hon. Librarian:* Mr. J. C. P. Atkinson.—*Hon. Lanternist:* Mr. A. W. Atkinson.—*Hon. Treasurer:* Mr. Alfred Naylor.—*Hon. Secretaries:* Messrs. Alfred Naylor and Thomas Coombs; these, together with Messrs. Godfrey Bingley, B. A. Bussell, F.I.C., and R. W. Savage forming the Committee for 1896. It was arranged the opening meeting of the session should take the form of a social gathering, members and one friend to be admitted free, the reception to take place in the Board-room of the Leeds Mechanics' Institute at a quarter to eight p.m. Coffee and light refreshments provided. President's address at a quarter past eight in the Society's room, the remainder of the evening to be spent in an exhibition (by limelight) of slides, procured by Mr. J. H. Walker. The Annual Lantern Exhibition is fixed to take place on February 6, in the Albert Hall. In past years these have been much appreciated by local lovers of art and photography, between twelve and thirteen hundred tickets being issued by the members of the Society to their friends. It consists chiefly of the work done during the past year, about 600 slides usually being sent in to the Selection Committee, from which the requisite number are chosen. We have no doubt the programme on the 6th prox. will be a good one, several of the members of the Leeds Photographic Society having taken medals at the photographic Exhibition held last autumn in the Municipal Art Gallery. Some remarks have been applied to this Society suggestive of a petrified condition, but the Committee, while not endorsing any statement to this effect, are earnest in their endeavour to make all connected with it and the Convention meetings in our city this year a success. The Convention Committee has commenced a subscription list in connexion with the local expenses, and have already had several hearty responses. We hope for and will help so fair a start to a good finish.

THE Moonlight Patent Lamp Company, Liverpool, notify us that their telegraphic and cable address has been altered from "Iredale, Liverpool," to "Moonlight, Liverpool."

WE are asked to state that the *Englishwoman* is publishing a series of photographs of beautiful young Englishwomen, and the editor of that magazine will be glad to receive from amateur or professional photographers suitable pictures for reproduction. A fee will be paid for all photographs published. Photographs should be addressed to the editor of the *Englishwoman*, 125, Fleet-street, London, E.C.

BOSTON CAMERA CLUB.—Established January, 1894. Meetings are held at Shodfriar's Hall, Boston. *President:* Rev. W. FitzHarry Curtis.—*Vice-President:* Mr. W. H. J. Wood, M.R.C.S., L.R.C.S.—*Committee:* Rev. H. Curtis, Messrs. J. Best, A. R. Beaumont, G. Warner, and H. Wood.—*Treasurer:* Mr. C. G. W. Phillips.—*Secretary:* Mr. A. Hopewell Smith, M.R.C.S., L.R.C.P., L.D.S., Linden House, Boston, Lincolnshire.

CARDIFF PHOTOGRAPHIC SOCIETY.—An International Photographic Exhibition of photographs, photographic apparatus, and appliances and photographic processes will be held in a specially erected building in Gathays Park, Cardiff, in conjunction with the Cardiff Fine Art, Maritime, and Industrial Exhibition. The Exhibition will open early in May, and continue open for a period of six months or thereabouts. The Honorary Secretary is Mr. T. H. Faulks, 127, Bute-road, Cardiff.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
27	Camera Club	*Photo-micrography.* T. Charters White.
27	Croydon Camera Club	Rehearsal of Members' Slides to be shown on the 29th.
27	Richmond	*My Camera, Hand and Stand, and How I Use it.* The President.
28	Birmingham Photo. Society	Demonstration upon the Manipulation of the New Enlarging Lantern. Messrs. W. Bateman and C. S. Baynton.
28	Brixton and Clapham	*Elementary Photo-micrography.* R. G. Mason.
28	East London	*Composition, and Light and Shade.* E. Atkinson.
28	Hackney	Open Night.
28	Royal Photographic Society	*Dr. Rudolph's Method of Lens-testing and some of his Results.* J. H. Agar Baugh.—*Stereomicrographs with New Colour-tone Effects.* Fred. Iles.
29	Borough Polytechnic	*Photographic Apparatus.* T. F. Bunce.
29	Croydon Camera Club	*In Eastern Lands (Tunis and Egypt).* Ernest R. Ashton.—Members' Slides.
29	Leytonstone	Members' Lantern Evening.
29	Photographic Club	*The Avon Valley.* Harold Baker.
29	Newton Heath	Social Evening and Lantern Exhibition.
30	Ashton-under-Lyne	*What is a Picture?* Charles Taylor.
30	Bradford	Second Annual Social.
30	Camera Club	*Nature's Method of Correcting Astigmatism, &c.* Dr. Lindsay Johnson, M.A.
30	Leeds Camera Club	*Toning of Platinotype Prints.* Rev. J. Beanland.
30	Leigh	Lantern Evening.
30	Liverpool Amateur	*The Golden Valley and the Black Mountains, a Holiday in King Arthur's Country.* Dr. J. W. Ellis.
30	Oldham	*Amongst the Dutch.* S. L. Coulthurst.
31	Birkenhead Photo. Asso.	*The Carbon Process.* Mr. Rae.
31	Bournemouth	*Photo-ceramics.* W. Ethelbert Henry, C E.
31	Croydon Microscopical	Conversational Meeting.
31	West London	*Through County Donegal with a Camera.* G. Lamley and H. Selby.

ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 21,—Photo-mechanical Meeting,—Mr. T. Bolas, F.I.C., F.C.S., in the chair.

Mr. E. SANGER SHEPHERD read a paper on

IRREGULAR GRAINED SCREENS.

He said that, of the methods at present adopted for producing an irregular grain, probably that most used was transferring from a collotype plate to stone; but by this means one was never sure of getting any particular grain, whereas, if the grain was in the screen, one could select a grain suitable for the subject, and, on developing the negative, the result was seen at once. The irregular-grained screen which he recommended was used in much the same manner as a cross-line screen, *i.e.*, placed a short distance in front of the plate in the camera, and he had found that good results might be obtained by either the wet or dry-plate process, but the distance from screen to negative must be less than in the case of the cross-line screen. The screen was made by flowing an aquatint ground over a sheet of glass, etching with hydrofluoric acid, then repolishing the glass, and filling in with printing ink, and such screens were practically permanent, as, in case of damage by access of nitrate of silver, &c., the ink could be removed and the etched parts refilled. These screens could be used in three ways: the etched screen as described might be used, and this was the most useful form; a copy of it on a dry-collodion plate, which was liable to stains, and other disadvantages; or a bitumen grain could be laid on the grain and heated, but this is only useful for photo-lithographic work. Other methods of utilisation were to first expose a dry plate under the screen, afterwards exposing to the subject to be copied; or to print from a negative on autotype tissue, and then expose the tissue in contact with the screen. The screens could be made in large sizes, and were applicable to the poster work; they were also very useful in photogravure. His experience was that "devils" were due to impurities in the copper plate, generally iron. He had found it difficult to obtain samples of hydrofluoric acid suitable for etching, it was not strong enough. He had tried very many forms of resist, but none would stand the action of the acid for more than about three-quarters of a minute.

The ASSISTANT SECRETARY (Mr. Child Bayley) suggested the addition of ammonia to the hydrofluoric acid.

Mr. SHEPHERD said the use of fluoride of ammonium caused a ragged, instead of a clean, line, but with hydrofluoric acid the lines were clear and brilliant. There was, however, considerable difficulty attending the production of irregular-grained screens, more so than with etched line screens. He believed ruled screens would be less expensive.

Mr. LEON WARNERKE referred to the use of the dusting box, but

Mr. SHEPHERD said the dusting box was one of the most aggravating tools it was possible to use.

Some discussion took place with regard to various means of securing a uniform grain by means of dusting asphalt, at the conclusion of which a vote of thanks was passed to Mr. Shepherd, who exhibited a number of screens, negatives, blocks, and prints in illustration of his remarks.

PROFESSOR RÖNTGEN'S DISCOVERY.

Mr. J. W. GIFFORD, of Chard, exhibited some results which he had obtained in photography by the invisible rays of a Crookes radiant-matter tube, upon the lines of Professor Röntgen's recent investigations. He detailed his method of procedure, from which it appeared that, having set up the radiating tube, he placed a very rapid dry plate in a wooden box, situated at a distance of three inches from the source of radiation; a child then held his hand between the box and the tube, and an exposure of five minutes served to impress a very distinct image of the hand, showing indications of the bones and a much clearer representation of the finger nails. A second experiment was then described, similar to the first, except that an ebonite developing dish was interposed between the wooden box, containing the plate, and the child's hand, and it was found that the ebonite offered no obstruction to the radiations, but the ribs at the bottom of the dish appeared to cause a refractive action. The interposition of a thick porcelain dish caused an appreciable obstruction to the rays, and increased the necessary exposure to ten minutes. The next experiment described showed that a somewhat similar effect might be produced without a Crookes tube, the sparking electrodes of a coil apparently emitting similar radiations, by means of which Mr. Gifford obtained an image of a child's hand which was placed outside a wooden box which contained the photographic plate. This looked like an electrical effect, and, although at the present stage of the inquiry he could only speak with the greatest reserve, he thought it might prove that Professor Röntgen's effects were to be explained by electrical induction as set forth in the doctrines of Hertz, as well at least as by regarding them as due to the light and the ultra-violet; perhaps, indeed, we might be on the "No-man's-land" between them. However this might be, the thanks of all photographers were certainly due to Professor Röntgen for having first drawn attention to these effects.

A long discussion ensued with regard to some apparently inexplicable problems with which Mr. Gifford had been confronted in the course of his experiments, and the meeting closed, after a prolonged sitting, with a cordial vote of thanks to him for his most interesting communication. Mr. Gifford's results may be inspected on application to the Assistant Secretary of the Society, at 12, Hanover-square.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 16, 1896.—Mr. Walter D. Welford in the chair.

Mr. H. C. Rapson showed two lenses or combinations of lenses by Ross, both marked No. 2, and wanted to know of what they were parts. It was suggested that they were the back combinations of two portrait lenses for a stereoscopic camera.

Mr. Walker passed round some plates, stripped for examination, and backed with an anti-halation paper, and asked the opinion of the members as to its efficiency.

The question of its perfect optical contact was raised, and it was pointed out that double reflections could be seen through the glass, thereby demonstrating its unsuitableness as a preventive of halation.

COLLOTYPE.

The HON. SECRETARY passed round some collotypes by Mr. Wilkinson, and prints by the photo-autocopyist process, and said that at a previous meeting a question was raised as to the comparative merits of these processes, and he had lent Mr. Wilkinson negatives for this purpose. In the results he noticed there was a certain amount of spottiness in the autocopyist print—not grain, but spots of ink, which he thought an imperfection in the printing method. It was not noticeable in the prints on rough paper, but only on the surface paper. He considered the collotype had the advantage, with which most of the members agreed.

The CHAIRMAN said that, the photo-autocopyist film being so much thicker than that of the collotype, the gelatine might be more liable to attack, and thus cause the defects.

Mr. J. E. HODD did not think that the papers used—one rough and one smooth—conduced to a fair comparison of the merits of the processes. He mentioned a print by the autocopyist of a castle or abbey, which, in his opinion, would take a lot of beating by the collotype process.

The question as to whether rough or smooth paper gave the greater contrast was discussed, but opinions were divided.

The HON. SECRETARY thought the superiority of the collotypes was very largely in the evenness of the prints, and the absence of defects such as spots, &c. One could get a clean print with collotype, but very rarely with the autocopyist.

Mr. J. E. HODD inquired the result of any trials of Cadett's spectrum plate by the members, but nobody seemed to have used them.

STRIPPING NEGATIVES.

The HON. SECRETARY asked for members' experience in stripping negatives

and which was the best process. He had tried one published by Burton, consisting of—

Methylated spirit	2 ounces,
Water	3 drachms,
Hydrochloric acid	1 drachm,

and found that, after an immersion of five or six minutes, the film readily stripped off, remaining almost its original size.

The CHAIRMAN considered that the quality of the water influenced stripping to a large extent. He had noticed that it was most difficult to strip a negative from which a great number of prints had been taken, and inquired the action that rendered the film firmer after excessive printing.

The HON SECRETARY passed round an enlargement of a snap-shot of the late Mr. Traill Taylor, presented by the Chairman, which he considered a very characteristic likeness, and proposed that it be framed with the other decided upon, and hung in the room.

This was seconded by Mr. DRAGE and carried, and a vote of thanks accorded to the donor.

THE WATKINS COMPETITION.

The CHAIRMAN drew attention to the result of the developing competition instituted by Mr. Alfred Watkins, which has been to award the first prize to Mr. B. J. Edwards, who was Watkins's strongest opponent, proving that it is possible to alter the relative gradation of a negative in the development.

Mr. R. BECKETT said he had received two strips from Mr. Cowan, in which he had altered the gradations very much more than a good many had an idea that it could be altered, and without fog.

The HON. SECRETARY said that the experiments, as shown at the Photographic Club, seemed to him a very curious way of arriving at a conclusion. They have judged by the silver print from the negative. He asked whether the scale of gradations in the silver print was the counterpart of the scale of gradations in the negative.

Mr. A. MACKIE pointed out that it was Watkins's own idea to use the print. He agreed with Mr. Edwards that the scale of gradations could be altered.

A long discussion ensued on this point, and on the new discovery by Professor Röntgen.

PHOTOGRAPHIC CLUB.

JANUARY 15,—Mr. E. A. Newell in the chair.

Mr. BIRT ACRES gave a demonstration of his new

KINETOSCOPIC LANTERN.

By means of this instrument, which is Mr. Acres' original invention, he is able to show upon the lantern screen enlarged pictures representing consecutive phases of motion. He showed pictures of the Derby, the course being cleared, the actual race, with the group of horses rushing to the front of the picture and out of it, and the subsequent thronging of the crowd across the course. He also threw upon the screen a series of representations, taken from the life, of three skirt dancers, a boxing match, and a set-to between the boxing kangaroo and its master. In another set of pictures the German Emperor, attended by his little sons, walking up and down the lines of one of the German crack regiments drawn up for review purposes. Mr. Acres' masterpiece, however, is a series representing "breaking" waves on the seashore. The great and striking difference between Mr. Acres' pictures of waves followed by fresh waves, and each breaking with the thousand variations of form which obtain in nature, and the zoetropic semblance of motion followed by identical semblance of motion, is most marked. The Photographic Clubbers present testified to their admiration by round after round of hearty and spontaneous applause. The instruments for showing the pictures and the series of negatives themselves are Mr. Acres' own work. The negative impressions are made at an average rate of thirty to forty per second, on lengths of film of from forty to sixy feet; if necessary, as many as one hundred exposures per second can be made; the size of the original negative is approximately $1 \times \frac{3}{4}$.

Mr. SUNDERLAND then gave an interesting paper upon the subject of the engraving and printing of half-tone blocks, which was followed with interest.

Mr. ISENTHALL showed a camera which he said he believed was the smallest working camera in the world. It was made for taking photographs of the larynx. The lens, which is of a rectilinear form, is by Steinheil, and the plate, which is contained in a minature slide, is one inch square. The camera is fixed and adjusted in the ordinary manner. The pictures, however, are made by reflection from a silvered mirror, the patient's larynx being illuminated by a one-candle power incandescent lamp. The average exposure is about twelve seconds, but some practice on the part of the patient is required to sit for this length of time without movement, as it is said that considerable irritation results from the insertion of the apparatus into the mouth and throat.

Croydon Camera Club.—The meeting on Wednesday, January 15, was a members' Lantern Night, when a large and varied number of slides were shown upon the screen, the best of these being chosen for public exhibition at the Braithwaite Hall on the 29th inst. The following members contributed:—Messrs. Maclean, Watson, James, J. Noakes, A. J. Noakes, Hirst, Rogers, Holland, Myrtle, and Bowen. During the evening the PRESIDENT explained a newly invented automatic photo-printing machine, which prints, develops, and finishes several thousands of prints a day at an estimated cost of about eight half-plate prints for one penny. The image was on silver bromide paper, and he showed a long strip of prints which had been thus printed. Messrs. Gosheron and Morgan were elected members.

Croydon Microscopical and Natural History Club (Photographic Section).—On Wednesday evening, the 15th, twenty-two of the members of this Club availed themselves of the kind invitation of Brin's Oxygen Company to visit their works. Arriving at seven o'clock, they were most courteously received by Mr. K. S. Murray, by whom they were conducted over the whole of the works, and by whom every step in the process of obtaining and

COMPRESSING OXYGEN

was most minutely explained. The process has been so often described, and is so fully dealt with in Mr. Murray's book on *Compressed Oxygen*—a book which, by the way, ought to be in the hands of all users of compressed gases—that it is hardly necessary to recapitulate all the details here. Suffice it to say, that the members saw the working in every stage, from the purification of the air by means of caustic lime and soda, the passing of the dried and purified air into the retorts at a pressure of about ten pounds per square inch, such retorts being charged with masses of porous barium monoxide (obtained by heating barium nitrate), and arranged in a furnace, which is heated to 1300 degrees by means of burning carbon monoxide, a system causing less damage to the retorts and furnaces than direct firing. At the end of five minutes this part of the process stops automatically, and, a series of valves being reversed, the pumps, instead of forcing air into the retorts, create a partial vacuum, and the oxygen which was absorbed by the barium monoxide, converting it into peroxide, is given up, and passes on to the oxygen gas-holder. After another five minutes, this part of the process stops, a reversal of the valves again takes place, and air is once more forced into the retorts, and so on indefinitely. The process of annealing cylinders—*i.e.*, heating them to a dull red heat in furnaces heated also by burning carbon monoxide, and allowing them gradually to cool—was then shown, as also was the testing of them by means of the hydraulic pump, to ascertain that no "permanent stretch" was imparted to the metal. Finally, the filling of cylinders with oxygen at a pressure of 120 atmospheres, or 1800 pounds per square inch, was shown, and, after having spent a most interesting visit of one and a half hour's duration, the members, after according a hearty vote of thanks to Mr. Murray, returned to Croydon.

ON Friday, the 17th, a very crowded audience attended to witness the exhibition on the screen of some 150 lantern slides by Captain ABNEY, who most kindly attended and gave a full explanation of each slide. The views consisted of Alpine scenery in the winter time, and comprised not only such parts of the mountains as are perpetually covered with ice, and the glaciers, but also some remarkably fine effects of snow and hoar frost. Not less remarkable, and certainly not less beautiful, were the cloud effects in these cold and lofty regions. No one who has not visited the Alps, or been fortunate enough to see such a selection of slides as these, can form any clear notion of the splendid, though frigid, scenes there to be met with. A most cordial vote of thanks was proposed, seconded, and carried unanimously to Captain Abney, not only for the use of his slides, but for his kindness in coming down to explain them.

East London Photographic Society.—January 14, Mr. Walter R. Gould presiding.—A lecture and demonstration on

PLATINO-BROMIDE PAPERS

was given by Mr. NAHUM LUSBOSHEZ, of the Eastman Company, which was attentively listened to. The examples brought for inspection—some of them measuring about six feet by five feet—were perfect specimens of their kind, and spoke volumes for the capability of the paper. The exposure and development of the paper was thoroughly explained, the lecturer preferring, in place of some of the newer developers, the old-fashioned ferrous oxalate, giving, as his reason for such preference, that, with this developer, the image was more under control, and allowed the operator time to modify the result if necessary, whereas, with the newer kinds, the image flashed up at once, and gave one little or no time to rectify the exposure. The instability of uranium toning for bromide papers was remarked upon, and, for those who were desirous of altering the steely appearance of their prints, he gave the following formula, which would produce a pleasing brown tone:—Hypo, 10 ounces; alum, 1 ounce: water, 80 ounces. To make the bath work quickly, it was advised to heat the solution to almost boiling point, the print first being put in the liquid before the operation commenced, having previously been developed and fixed in the ordinary way. When the toning is accomplished, the solution, with the print still in it, should be allowed to cool, and then the print should be taken out and thoroughly washed. To illustrate his remarks, the lecturer toned a print before the audience, which amply confirmed what he had said. Difficulties which the less experienced photographers are likely to meet with in working these papers were commented upon, and cleared up in a way as to leave no room for future failures.

Hackney Photographic Society.—Mr. E. Puttock in the chair.—A discussion on the question as to

WHETHER NEGATIVES LOST DENSITY

in the fixing bath took place. Mr. HUDSON thought that there was a distinct loss when fixing out negatives which had been developed with eikonogen. Mr. HENSLER thought that the loss in density was more apparent than real, arising from the increase of transparency by the fixing out of the bromide of silver, &c. Mr. GARDNER considered that there was a loss, and more so with rapid plates than with slow. Mr. A. BARKER had noticed it in cases of under-exposure, when forced development gave an image seemingly very dense, but which, on fixing out, became a mere ghost. Mr. R. BECKETT said that the quicker the development the greater the loss in fixing. There was a difference in the respective actions of old and new fixing baths. The latter caused more loss in fixation than the former, particularly with some brands of plates. He advised instead of using entirely fresh baths, to use a mixture of old and new, they would work much more evenly. Mr. BUTCHER, of Blackheath, then showed the capabilities of the firm's incandescent gas lantern. He said that they did not claim that the light was equal to limelight, but was superior to the majority of oil lamps in power, and to all in the qualities of portability, cleanliness, freedom from smell, and comparative coolness. A six-foot disc was illuminated at the meeting, and the light, although by no means comparable with the oxyhydrogen, was considered to fully bear out Mr. Butcher's claims.

North Surrey Photographic Society.—Mr. R. W. Wilson, who has fulfilled the duties of Hon. Secretary for the last four years, has, to the great regret of the members, been obliged to resign, in consequence of increased demands on his private time. Mr. W. H. Baldwin, of 49, Christ Church-road, Streatham Hill, has been appointed his successor, and has arranged an attractive programme of demonstrations, competitions, &c., for the new year. The first demonstration of the season was given on Tuesday, January 7, before a large

gathering of members, when Mr. E. CECIL HERTSLET, after explaining Hübl's method of

TONING PLATINUM PRINTS

with ferridcyanide of iron, toned several prints, and then invited some of the members present to do the same. The operation worked with great rapidity and smoothness, the prints acquiring colours varying, in accordance with the length of their immersion in the toning bath, from a pale slate to a bright sky blue. In order to show how completely the print could be restored to its original black, if so desired, Mr. Hertslet considerably over-toned one specimen, after which he easily removed the whole of the acquired colour by immersing it in a bath made strongly alkaline by carbonate of soda. The print was, when rinsed, placed in an acid bath for a few seconds, and then toned again to the proper colour. At the conclusion of the demonstration Mr. Hertslet passed round for inspection a number of prints which he had previously toned, in order that the members might be able to judge the different shades of colour when dry. He said that, as the tone would yield to alkalies, it was not to be expected that the colour would be permanent, unless the prints were framed and glazed, and mounted with a solution which was strongly acid.

Birmingham Photographic Society.—January 14.—The Annual Meeting of this Society was held at the rooms, Exchange-buildings, Sir J. Benjamin Stone, M.P. (President), in the chair. There were also present Messrs. G. F. Lyndon, J. H. Pickard, C. J. Fowler (Hon. Secretary), T. W. Robinson, W. Jones, A. J. Leeson, W. Bateman, G. Thomason, T. Taylor, Underwood, and W. T. Greatbatch. In their eleventh annual report the Council expressed their pleasure in being able to record the continued success and satisfactory position of the Society. The removal to the new rooms chronicled last year had proved beneficial in every way, and had fully justified the Council in taking the responsibility of the experiment. Many excellent papers and demonstrations of a practical nature had been given, together with an instructive discourse upon the artistic elements of photography, by Mr. Charles Morgan, of the Birmingham School of Art. Manufacturers of novelties had also favoured them with interesting descriptions of their appliances. The average attendance at technical meetings had been about thirty-five. Seventeen new members had been added during the year. No further Exhibition had been held at the Crystal Palace, so that the Challenge Cup still remained in the hands of the winners for 1893. To meet a generally expressed desire, the Council had had constructed a thoroughly efficient enlarging lantern, fitted with all modern appliances for use with artificial light. The Exhibition was held on May 6, being opened by the President, in place of Mr. Sam. Timmins, who was unfortunately unable to attend. It was, for the first time, open during the whole of the week, and the numerous attendance, in spite of remarkable summer weather, together with the handsome profit made, would justify the experiment being repeated upon similar lines. The Open Classes included rather more outside entries than last year. The quality of the exhibits was good, and showed a distinct advance in the general evenness of the work. The total number of exhibits was 437, from 45 competitors. There were also many excellent pictures kindly lent for exhibition only. The silver Challenge Cup for the highest number of awards in all classes was won by Mr. W. T. Greatbatch, who gained three firsts and three honourable mentions. The HON. SECRETARY of the Warwickshire Photographic Survey Section reported that progress had been made during the year, in that a number of photographs had been handed in to the Hon. Curator, sufficient to fill the frames belonging to the Survey Council. Arrangements had been made for a third Exhibition of the pictures in the Art Gallery in February next, when they would be presented to the Council of the city of Birmingham. This would bring the number of photographs so presented to over two thousand, mainly the gratuitous work of the Survey Section of the Society. The funds of the Section were well in hand. With regard to the excursions, a slightly lower average attendance was secured than in the previous year. The majority of the excursions were, however, very enjoyable ones, and resulted in some good pictures being obtained. The accounts showed a balance of 7*l.* in hand. The CHAIRMAN, in moving the adoption of the report, alluded to its satisfactory nature. The progress of photography was, he said, so wide that, in order to encourage further development, they, as an association, should hold the very widest views and largest sympathies. In their exhibitions the classes should be as wide as possible. Apart from the fact that the members were competing with each other, the outside world looked upon them as representing the photographic world, and everything which was progressive in the art should be brought before the public through their medium. He hoped, therefore, that the Exhibition would become more popular and illustrative of photographic advancement each year. There had been two or three striking developments in the art during the year, particularly in the direction of colour photography and in photographic illustrations in newspapers. In the latter department he thought such societies as theirs might do much to raise the tone of the illustrations. It was impossible to conceive more wretched work than some of that which was published in this manner. He hoped that public taste would make itself felt with regard to those publications which were merely advertisements of artists, &c., and the artistic merit of which was bad. The paragraph relating to the photographic survey of the county was satisfactory so far as it went, but he hoped they might do still more work in that direction. Warwickshire pictures were by no means exhausted yet. There was a great deal to be done in the way of detail, which he hoped would be accomplished in future. He still hoped that the national scheme to survey the country would be taken up before long. He had had a number of letters from most influential people on the subject, urging him to push forward the movement. Mr. PICKARD seconded the motion, which was adopted unanimously. The retiring officers having been thanked, the following elections were made:—*President:* Sir. J. Benjamin Stone, M.P.—*Vice-Presidents:* Messrs. G. F. Lyndon, W. Jones, J. H. Pickard, and G. A. Thomason.—*Hon. Treasurer:* Mr. F. J. Penn.—*Hon. Librarian:* Mr. W. S. Horton.—*Hon. Secretary:* Mr. C. J. Fowler. The proceedings concluded with a vote of thanks to the Chairman.

Bolton Photographic Society.—January 14.—Mr. J. Boothroyd gave a practical demonstration of the exposure and development of lantern plates. The skate-blade cutting board, manufactured by Messrs. R. & J. Beck, was exhibited, and met with great approval.

Bradford Photographic Society.—January 16, Mr. A. P. Rendell in the chair.—Mr. P. R. SALMON gave a lecture, entitled

"MY AIM IN PHOTOGRAPHY,"

in the course of which he pointed out the desirability of working with a purpose and an end in view. The lecturer who was on the syllabus for that evening had, for some reason or other, withdrawn at the last minute, and Mr. Salmon kindly came forward to fill in the evening. Although the notice was so short, Mr. Salmon managed to prepare no less than ninety slides to illustrate his remarks. Thirty slides were used to point out the various aims that could be taken up, such as landscape, seascape, hand-camera work, astronomical, microscopical, historical work, &c. The remainder illustrated studies of country life of the Robinsonian type, in which branch the lecturer was aiming at perfection, several slides from Mr. Salmon's negatives including Hood's *Song of the Shirt, Cinderella, Red Riding Hood*, &c., were shown. A vote of thanks, proposed by Mr. O. Nicholson and seconded by Mr. W. Booth to Mr. Salmon, and also to Mr. W. Harnsworth, of Appleton & Co., for manipulating the Club's lantern, were passed unanimously.

Darwen Photographic Association.—January 16, the President (Rev. Henry Irving) in the chair.—A number of slides, kindly lent by Messrs. R. W. Thomas & Co., photographic dry-plate manufacturers, were projected on to the screen, comprising many very difficult subjects of Westminster Abbey, exteriors and interiors of all the leading cathedrals, Windsor Castle, St. George's Chapel, and the Albert Memorial Chapel, Windsor; the Royal Mausoleum, Frogmore, and many other places of interest. To photograph the two latter places Messrs. Thomas & Co. have had to obtain special permission from her Majesty, and it is believed that the slides which this firm have in circulation are the only ones extant. The views were taken on Thomas's anti-halation plates, and the beautiful definition obtained in the high lights and also the quality of the lantern slides speak well for the plates on which the photographs were taken.

Dewsbury Photographic Society.—January 14.—The Secretary was kept fairly busy entering new members and taking subscriptions. He announced that the February meeting would be filled by the showing of some prize slides, and the March meeting by other prize slides. The Society's quarterly competitions were eagerly discussed by the members, most of whom said they should compete. The handing round of specimen copies of a paper which was well spoken of by those who already took it, and a discussion on lenses, by the Secretary, Mr. E. Human, and Mr. Earl, brought a very enjoyable evening to a close.

Leeds Camera Club.—The optical lantern, or, to give it its more popular title, the "magic" lantern, possesses such a power of fascination for old and young alike as almost to justify its better-known name. Most particularly amongst photographers is this the case, and the lantern and camera may fairly be looked upon as twin sisters. It will be readily understood, therefore, that Mr. R. BOURKE's demonstration upon

"THE OPTICAL LANTERN AND ITS USE"

on Thursday last had been looked forward to by the members of the Leeds Camera Club with considerable interest Nor were their expectations in any way misplaced, for Mr. Bourke furnished them with a most instructive series of experiments, and his lecture throughout was brimful of useful hints on lantern matters. After describing the construction and optical system of the lantern, the demonstrator dealt fully with the oxy-hydrogen light for the lantern, which he recommends for all purposes in preference to oil. Using both single and biunial lanterns, Mr. Bourke lucidly explained the principles of the light, using oxygen under pressure in cylinders, and hydrogen (coal gas) from the mains; he showed the use of the pressure gauge for ascertaining the contents of a gas cylinder, and also the advantages of employing a suitable regulator for the supply of the gas to the jets. A comparison was made between the light intensity through an ordinary blow-through jet and the Ejector jet, much to the advantage of the latter. The Optimus safety ether-oxygen saturator was also tested, and proved very satisfactory, the light being considered by many lanternists present to be quite equal to that of a oxyhydrogen mixed jet. Experiments were also made with the incandescent gas burner for lantern use, but the results were not very encouraging, the mantles being pronounced too fragile for the purpose. Mr. Bourke exhibited several novelties in lantern accessories, including an improved slide box of his own design, and at a late hour was accorded a hearty vote of thanks for one of the most practical and useful lectures of the session.

Liverpool Amateur Photographic Association.—Owing to ill health, Mr. Anyon was unable to give his demonstration on bromide printing, which had been arranged for Thursday evening, the 16th inst., but his place was taken by Mr. H. W. SEARLE, who gave a demonstration on the

A B C DEVELOPER FOR GELATINO-CHLORIDE PAPER,

by the aid of which prints can be obtained on ordinary printing-out paper after an exposure to a short length of magnesium ribbon. Mr. Searle went through the whole process of printing, developing, toning, and fixing in the presence of the members, the development occupying less than three minutes. Two different samples of paper were used, the results in each case being very satisfactory. All the operations can be conducted by ordinary gaslight, no dark room being necessary.

Edinburgh Photographic Society.—January 8, Mr. J. C. Oliphant, M.A. (President), in the chair.—Thirteen new members were enrolled. A number of slides, kindly sent by R. W. Thomas & Co., illustrating the value of their anti-halation plates, were shown. Mr. PATRICK (Vice-President) spoke of the death of Mr J. Traill Taylor, and it was agreed to notify the reference in the minutes of the Society. The Lothian stereoscope was then shown by Mr. A. H. Baird, the inventor, who is a member of the Society. It was explained that with this form of stereoscope any observer can adjust the centres of the lenses to suit himself, and that the design of the instrument allowed the eyes to come close to the lenses.

FORTHCOMING EXHIBITIONS.

1896.
February 27–29 ..... Woolwich Photographic Society.
March 2–6 ..... *South London Photographic Society. Hon. Secretary, Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.
" 3–6 ..... *Cheltenham Amateur Photographic Society. Phillp Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

"NEGATIVE PAPER."

To the EDITORS.

GENTLEMEN,—Kindly allow me to add my wishes to the request for a revival of the above. I have a roll-holder, which I have not used lately, but would gladly put it into use again with paper.

I may state that some years ago I used it with Eastman transferotype paper, and found it very convenient for many purposes in landscape and architectural photography. The great fault was its great slowness and the occasional failure in stripping. The Eastman Company withdrew it from the market, but, I understand, have again put it on sale, vastly improved, and I am therefore going to try it once more.

If they would put it in rolls to suit their holders, and quicken the speed, I feel sure there would be a big demand. It gave remarkably fine detail and gradation, and developed clean and without fog, a great boon for lantern and microscopic work. Surely their great enterprise is equal to this.—I am, yours, &c., J. A. C. O.

SAPIENT SUGGESTIONS.

To the EDITORS.

GENTLEMEN,—Many a wise word is spoken in jest. In your last, "Cosmos," who often has an attack of inspiration, and, like Charles II., never spoke a foolish word, suggests "the conferment of the Honorary Fellowship of the Royal Photographic Society on Mr. H. P. Robinson, Mr. A. Maskell, or" (it should be "and") "Mr. G. Davison; the admission of the Linked Ring to Affiliation; the bestowal of the Progress Medal on Dr. Burton Coxe; the increase of the Assistant Secretary's salary to 1000*l.* a year."

It is claimed that the Society has greatly improved since the three gentlemen mentioned retired from it. If the improvement was due to their secession, it was therefore due to them; but they have done more than that—although they left not too amicably, they have been constant objects of admiration and imitation by the Society in all matters, except, perhaps, the mechanical hanging of the Exhibition, of which they do not understand the science, and resort to all sorts of dodges and artful massing of pictures so that they shall be seen.

I don't know about Dr. Burton Coxe. I am afraid he tries to be reasonable, which never succeeds; but the last proposition, I am sure, would meet with the approbation of every member of Council who did not see a better way of disposing of the increased income in other pockets than the genial Secretary's. The money came easy. There was a large profit on the goods for which it was paid, and, if we may judge by the proceedings in the past, there is no better way of disposing of it yet proposed or discovered. There is only one question to consider? Is 1000*l.* enough? Don't let us be mean.—I am, yours, &c., AN OLD MEMBER.

METOL.

To the EDITORS.

GENTLEMEN,—I have been using metol for several months, and shortly before the end of last year my skin began to peel off in scales, and the inflammation going under the finger nails caused great pain, that I got alarmed, and wrote to Mr. J. Hauff as to his advice what would be the best cure.

As I had seen in your paper that others had suffered from the same cause, I think it best in the interests of humanity to send you the letter, and ask you to kindly make it known as being the maker's own views. I feel it would be a great pity if the valuable developer metol were compelled, through its one defect, to take a back seat.—I am, yours, &c.,
Oelsnitz, January 1, 1896. E. S. DOUGHTY.

[TRANSLATION.]

TO MR. E. S. DOUGHTY.

Oelsnitz.

IN reply to your letter of yesterday, I beg to inform you that it is possible that metol may affect very sensitive skins. I am, unfortunately, not in the position to give you an absolutely certain remedy for this trouble, but can only advise you to observe the greatest cleanliness when using it, and to rub the hands well in with vaseline, and then dry them before beginning to develop, and then after finishing to wash the hands immediately.

By observing these precautions I feel sure you will not be troubled with this unpleasantness again. Yours very truly,
(Signed) J. HAUFF.

THE PRODUCTION OF STEREOSCOPIC EFFECTS.

To the EDITORS.

GENTLEMEN,—IN THE BRITISH JOURNAL OF PHOTOGRAPHY, early in the year 1895, the present writer, whilst dealing with a kindred topic—the initial stage of composite portraiture—drew attention to the results produced by the superposition of two similar negatives, slightly differentiated in position. Some details were also given of the mode by which this purpose might be satisfactorily effected. He expressly noted that the resultant appearances were stereoscopic, and the phrase employed was varied, by designating it as presenting a "medallion-like appearance." In his experiments, the writer did not fail to note that, when the interior outline differed in depth of tone from the outer, the effect was enhanced, such variation being in some degree equivalent to a difference of tint.

With a view to secure the more complete results which have been recently aimed at, the writer would here take occasion to point out that the employment of the paraphernalia of coloured spectacles, with eye-glasses tinted differently, and supplied separately to each spectator, is a somewhat burdensome complication, and is not without remedy. The purpose would certainly be better served by the provision of one or two coloured lenses, rotating upon their axes, and at such sufficient speed as should flash the alternate illuminants upon the picture, so as to adapt themselves to the correspondent retaining power of the retina. In this manner the suffused intermittent lights would mask momentarily the medley of colour presented by the picture, whilst the lifelike impression of rotundity which is desired would be duly conferred.—I am, yours, &c., W. MATHEWS.
Clifton, Bristol.

ILLINGWORTH *VERSUS* DRAYCOTT.

To the EDITORS.

GENTLEMEN,—With your kind permission, I take this opportunity of thanking my numerous correspondents for their letters of sympathy and congratulation. As they are from all parts of the kingdom, it almost seems unanimous, and it is gratifying to know that so many of the profession agree with, and confirm, the Judge's summing up and the finding of the jury.—I am, yours, &c., WM. ILLINGWORTH.
Clifton Cottage, 168, *Heathfield-road, Handsworth, Birmingham, January* 21, 1896.

ANNUAL LADIES' NIGHT OF THE PHOTOGRAPHIC CLUB.

To the EDITORS.

GENTLEMEN,—I beg to inform you that the Annual Lantern and Musical Entertainment (Ladies' Night) will take place at Anderton's Hotel, Fleet-street, on Wednesday evening, February 12, 1896, at eight o'clock.

As on previous occasions, in order to ensure the comfort of the visitors, the Committee has decided to issue only a limited number of tickets; also that admission for both members and visitors shall be by ticket only. Tickets will be sent only to those members who apply for them.

It is desirable that as many members as possible should contribute slides on this—the most important lantern meeting of the season; so, if members have any they would like exhibited on the occasion, they are requested to send them to Anderton's Hotel not later than Wednesday, February 5, that a suitable selection may be made.

At the end of the present month, the Club will lose the valuable services of Mr. J. A. Sinclair, as Hon. Sec. and Treasurer, and all communications relating to matters arranged to take place after January 31 should be addressed to yours truly, F. A. BRIDGE.
East Lodge, 55, *Dalston-lane, London, N.E. January* 18, 1896.

CHELTENHAM PHOTOGRAPHIC EXHIBITION.

To the EDITORS.

GENTLEMEN,—I shall be obliged if you will allow me to point out in your columns that entry forms for this Exhibition, to be included in the catalogue, should reach me during the first week in February.—With thanks, I am, yours, &c., PHILIP THOMAS, *Hon. Sec.*
Cheltenham, January 30, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPH REGISTERED:—

Frederick Argall, High Cross, Truro.—*Photograph of the wreck of the "Cornish Lass" at St. Agnes.*

HISTORICAL.—A. MACDONALD. The best history of the early photographic processes will be found in Hunt's works on photography. They are out of print, but may at times be met with at second-hand bookshops for a small sum.

LANTERN-SLIDE BINDING.—SLIDE. Strips of black paper are sold by all the photographic dealers. They are more neatly cut than you could probably cut them yourself, unless you had proper appliances, and they are inexpensive.

SALARIES.—OPERATOR. It is impossible to answer the query, "What proportion of operators now obtain the salaries referred to last week?" The best houses still pay good salaries for really competent men. They often complain that really first-class operators and artistic posers are not easily obtained even now.

CARBON PRINTING.—T. HILL asks what is the reason that he cannot get the printed tissue to stick to the single transfer paper, if it has been kept a few days before it is used? When first received, there is no trouble if used then.—The reason is that the tissue has become insoluble by the keeping. Insoluble tissue will not adhere.

WOODEN DISHES.—T. BRADY asks: "What is the best thing to coat a wooden tray with that has to be used for the silver bath in the wet-collodion process, something that will not be harmful to the solution?"—There is nothing better for the purpose than paraffin wax. The wood must be perfectly dry and warm at the time it is applied.

METHYLATED SPIRIT.—T. ROMER. There is no way of obtaining methylated spirit free from the mineral spirit, except by getting a licence from the Excise in due form. Wholesale chemists are not allowed to sell it, any more than are the oil shops. Even if the licence is obtained, you will not be able to purchase absolute alcohol methylated.

RIGHT TO PHOTOGRAPH.—T. C. W. The caretaker had no right to prevent you from photographing the Abbey from the public highway; it was simply a bit of "bluff" on his part. You should have been more firm at the time. Be so the next time you go; defy him, and, if he touches you or the apparatus, summon him before the magistrates for assault.

COLLOTYPE.—X. A. B. A properly constructed drying box is absolutely necessary. A very important feature of the successful working of the collotype process is the drying of the plates—the time and the temperature. If you are handy at carpentry, you can construct one for much less than the price quoted. The design given in the book is a very good one.

SOCIETY FOR ASSISTANTS.—PHOTO says: "Will you kindly inform me if there is in existence a Benevolent or Protection Society for photographic assistants? if so, where to communicate." In reply: Alas! no, "Photo;" there is no such Society. You are one of scores that have put a similar question to us. Why do not you and they start a society which seems so much needed?

ACETYLENE.—A. B. WILSON says: "I have read the article in SUPPLEMENT of your paper on above, and have tried to get quotation in London for the calcium carbide, but have failed. Would you say where it can be bought and means of getting it? if the railway carrier will only carry it under special conditions? Your kind answer will greatly oblige."—Write Messrs. Harrington & Co., 53, City-road, E.C.

SATZ LENS.—L. MELDON says: 1. "What is the new Satz anastigmat I see mentioned on page 39? and, 2, in what does it differ from the Goerz? 3. Who makes it?"—In reply: 1. The Satz is, briefly, a system for providing a series of lenses of different foci in one sitting. See pages 46-52 of the ALMANAC for 1896. 2. The Goerz is a symmetrical doublet, each combination being composed of three lenses; 3. Messrs. Ross & Co. are the makers in England.

WINNERS OF PHOTOGRAPHIC PRIZES.—W. H. K. says: "Will you kindly inform me if there is a work published which gives the names of the winners, also a description of the titles of the photographs that have been awarded medals at the different photographic exhibitions held in this country?"—In reply: No such work is published. The information you require can only be obtained by diligent searching through the back volumes of the photographic journals.

QUICK LENS.—W. PAGE wishes to know what is the quickest lens made? He says he wants the quickest lens possible for taking street views of small size, about two and a half inches square. The most rapid lenses made are what are known as the baby lenses of the Petzval type. They are not well adapted for the work required. What we should recommend is one of the rapid stereoscopic lenses. They have a ratio of *f*-4, and will cover a small plate with the full aperture.

REMOVING SILVER STAINS.—W. J. HERBERT says: "In looking through your valuable book, THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, a few weeks back, I came upon a solution for removing silver stains on the negatives, sold by one of your advertisers. This last week I have had two or three negatives spoiled with the paper sticking to negatives. I have looked through the JOURNAL again, and I cannot find the advertisement."—In reply: Messrs. Marion & Co., Soho-square, supply such a solution.

GLASS POSITIVES.—ITINERANT.—Any work on photography of twenty year ago will give you the desired information about glass positives; so will the article on *Wet Collodion* in the ALMANAC for the current year.

LENS.—J. SIMPSON. "1. Would a No. 5D Dallmeyer lens, 12×10, be suitable for general studio work, *carte-de-visite* up to 12×10 groups—studio is twenty-nine feet long—or would I require to have a portrait lens suitable for *cartes-de-visite* and cabinets as well? 2. Would 5D Dallmeyer lens be rapid enough for all-round studio work?"—In reply: 1. The lens would be of too long a focus for *cartes* or cabinets. If a cabinet lens be obtained, that may, in that length of studio, be used for *cartes* as well. 2. Yes.

VARNISHING.—B. writes: "Can you please tell me how to prevent matt varnish, which it is desired to keep on the back of the plate, from running on to the gelatine film. I have tried tallow on edges of plate as well as indarubber solution, but have never succeeded in keeping the film side free from the varnish."—There should be no difficulty in the matter. Simply pour the varnish on, as with collodion, and flow it over the plate, taking care that it does not run over the edges. A little practice (very little) is all that is required.

FACSIMILE.—T. H. says: "I should feel obliged if you could inform me in your 'Answers to Correspondents' whether there is any process for reproducing writing in facsimile—one not taking too much time or requiring a press. The purpose for which it is required is for printing names, &c., on the back of prints."—Photo-lithography would be the most practical way, but that will necessitate a litho press; but they are not expensive, if of small size, and are purchased second hand. A negative could be made of the writing, and printed from, and the print mounted on the back of the photograph.

CLUB RULES.—F. DREW (Sheerness-on-Sea) says: "I am taking the liberty of writing you, asking you to send me a sample card or two of rules and prices of printed matter, &c., connected with a club. We are now trying to form a club; have no rules drawn up yet, and should like to see some rules of other clubs. I have no doubt you have printed some for others."—In reply: Write to the Secretary of the (London) Photographic Club, Mr. J. A. Sinclair, 26, Charing Cross-road, W.C., asking him to oblige you with a copy of the Club's rules. These rules have, we believe, formed the basis of many photographic societies' rules.

SHORT WEIGHT (?).—SALOP writes as follows: "I bought two ounces of silver nitrate at an apparently respectable chemist's. I used it four drachms at a time, and when I got to the last four drachms I found it only weighed a little over two drachms instead of four. Ought not this cheating to be exposed? Here is the label with the address of the chemist."—Our correspondent may subdue his wrath, as there is no fraud in the matter. Nitrate of silver is sold by avoirdupois weight, 437½ grains to the ounce, and he has weighed it out by apothecaries' weight, sixty grains to the drachm; consequently there are but fourteen drachms and thirty-five grains in two ounces of nitrate of silver.

COPYRIGHT.—S. R. M. says: "When I took this business, I, of course, bought all the negatives taken by my predecessor; some few of them he made copyright, but the majority of them he did not. An illustrated paper has pirated one of the latter. I have now registered the copyright at Stationers' Hall, and written to the paper asking for a guinea, and threatening proceedings if it were not sent at once. They coolly write back, some days after, saying they have made inquiries, and find that I have no copyright in the picture, and am attempting to obtain money from them that I am not entitled to. Kindly tell me the quickest way to bring them to book, as I will not be done by them."—What the paper says is perfectly correct. You have no copyright in the picture whatever. You are not the author of the work, as the picture was taken by your predecessor. You have no remedy at all.

PROCESS BLOCKS.—A. HOYLES asks: "Will you be good enough to inform me *re* the following:—1. Would it be worth while for, say, a dozen or so half-tone blocks that I require, to take up the process myself? A block-maker would do the twelve for 6*l*. 2. Can you give me a vague idea as to cost of necessary apparatus? I have ordinary studio and field cameras. I suppose these could be utilised? 3. I have read with interest an article in the ALMANAC this year by W. A. Whiston, F.C.S., entitled *Half-tone Work for Amateurs*. Would you be good enough to give me this gentleman's address, as I should like to correspond with him on the subject?"—Reply: 1. If the blocks can be obtained from a professional block-maker, it would certainly not be worth while to learn the process expressly to make them yourself. It would be false economy. 2. Write to Messrs. Penrose & Co., Upper Baker-street, W.C., for their price-list. 3. If you send the letter to us, we will address it and post it on. We do not give private addresses in this column.

HAND CAMERA.—HUNTSMAN says: "I am in want of a hand camera for the purpose of photographing the hounds and hunters and the various local meets. The lens should be very quick, and give a good definition. Would a ——— lens be the most desirable? I should like to be able to photograph while in the act of leaping. The camera should be small, and give a quarter-plate picture, or nearly so, and would a focal-plane shutter be best? Are you in a position to recommend a special maker by name or the name of his camera? I have not had any experience with a hand camera, and I am not familiar with any of the hand cameras in the market; they are so numerous and confusing that it is difficult to select."—In reply: We do not institute comparisons between the goods of one maker and those of another. For the kind of work our correspondent is about to undertake we should select a magazine focussing hand camera, with a flat field lens working at *f*-7 approximately, and a shutter whose maximum speed was not less than one-one-hundredth of a second. Our correspondent will find several hand cameras answering to the description here given advertised in our last ALMANAC.

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EX CATHEDRÂ.

One-man shows at the Camera Club were, some years ago, very popular both with exhibitors and visitors. Several good men had opportunities of displaying their work in its progressive stages, and lovers of photography had the exceptional advantage, which is of course denied them at an ordinary photographic exhibition, of studying the entire range of a man's photographic sympathies—and his limitations. We do not know whether these "shows" had to be dropped for lack of available material upon which to draw, or because the executive of the club has not considered it worth while to continue them.

* * *

However, although no public announcement has been made of the fact, there has been on view for some weeks, at the Camera Club, a one-man show by Colonel Gale, who contributes nearly a hundred of his works, so that possibly there is an intention on the part of the Club to resuscitate these happy and pleasant little exhibitions. We think we could supply the Club with the names of at least half a dozen men who, during the last few years, have "come on" sufficiently in their work to deserve the compliment of being invited to contribute.

Of Colonel Gale's work it is not here necessary for us to speak critically or in detail. Who does not know it, and, knowing it, does not recognise it as evincing artistic charm, produced by what is called, now and then, pure photography? Gale is equally at home in a sheep pasture or with a ploughing team, at a cottage doorway, on the Thames, or at a river-side quay. His effects strike one as being obtained without trickery; there is definition and detail present where the impression produced may partake of the nature of "breadth," and equally so where atmosphere has been introduced. Then, the care and attention he gives to the technique of his art, the accurate focussing and definition, the correctness of exposure, and the conscientiousness of his printing—are not these so many object-lessons to the young photographer in danger of being persuaded that the cultivation of photographic art is bound up with diffusion of focus and other fads? Colonel Gale's one-man show is well worth visiting and studying.

* * *

We are indebted to our contemporary *Nature*, of January 23, for Mr. Arthur Stanton's translation of Professor Röntgen's paper descriptive of his experiments with what he calls the X rays. Two of the Professor's photographs referred to in the paper are also reproduced by *Nature*, as well as one by Mr. Campbell Swinton, illustrative of that gentleman's experiments.

* * *

Mr. Alfred Watkins draws our attention to his Relative Speed List, which is published by Messrs. R. Field & Co., of Birmingham. The speeds given, to quote from the card, are "approximate only, for use with the Watkins exposure meter, compiled from actual daylight camera tests (pyro-soda developer)" by Mr. Watkins himself. English and American plates, lantern plates, and bromide papers are here "speeded," and the card, which is sold for twopence, is frequently reprinted so as to keep up with changes.

* * *

Speaking of this card, Mr. Watkins says: "It, of course, only gives the result of individual judgment, but great pains are taken, and I think it is useful to those who do not use meters." Doubtless this is so. Here and there we note that Mr. Watkins's figures quite square with our own experiences with certain brands of plates in the camera, and where we are not in accord with him the differences between us are not fatal. On the whole, this little card is calculated to be distinctly

helpful in enabling one who has to work with a variety of brands of plates to gauge, approximately, the exposures required.

* * *

Albumen paper certainly dies very hard. It might be thought that at such a late period, with gelatine and collodion papers disputing for pride of place, nobody could be found with so much confidence in the successful future of albumen paper as to embark afresh in its preparation and sale. The Electric Photo Company of 30, Fleet-street, however, are so moved and in sending us a sample of a new paper for trial they remark: "Before putting it on the market, we have pleasure in submitting to your notice a sample of our sensitised albumen paper, the qualities of which may, we hope, do something to prevent the use of this hitherto popular class of paper being discarded. The paper itself is the very best Rives, and is doubly coated with egg albumen, so that it is quite free from smell. The sensitising process is conducted with the utmost care in every detail, with the result that a paper is produced which is rich in silver, prints quickly, tones easily and of any desired colour. We claim for it that it is thoroughly reliable and economical both of time and material in working. With it can be produced prints as pleasing and as permanent as it is possible for a silver print to be."

* * *

We hope to take an early opportunity of trying the new paper. Without desiring to institute comparisons between albumen and gelatine or collodion we are, undoubtedly, of opinion that, if up to within four or five years ago the qualities of most of the commerical albumen papers had been what the Electro Photo Company desiderate in their letter, very many photographers would not have given up using it. There are features in good albumen prints which compel admiration for the process and are not always possessed by other methods of printing.

* * *

The Thornton-Pickard Manufacturing Company, Altrincham, send us a book of photographs showing the different departments of their works. The views, which are admirably executed and appear to be collotypes, depict the woodworking machinery shop, the cabinet-makers at work, the metal-workers, the brass finishers, shutter fitters, the examining and finishing room, the general office. Not merely as illustrating, step by step, the evolution of that universally admired specimen of mechanical ingenuity, the Thornton-Pickard shutter, but also as giving evidence of the enterprise and success of the firm, these photographs are interesting to a degree.

* * *

The Company also forward us their latest catalogue, a handsomely printed booklet, in which their specialities are fully described. The Ruby camera has been improved in several details, and is now made so that it can be used either as a hand camera or on a tripod. The camera is so constructed that the half-plate (as well as the larger sizes) can be used for stereoscopic work, in addition to ordinary pictures, if desired.

* * *

The Scovill & Adams Company, New York, write to us: "We regret to announce the death of our late honoured President, Mr. Washington Irving Adams, which occurred at his residence, in Montclair, New Jersey, Thursday, January 2, 1896. We beg, gratefully, to acknowledge the expressions of sympathy and good will which we have already received, and to state that Mr. W. I. Lincoln Adams, who has been our Vice-President, has now succeeded his father in the official position, which he has practically been filling for the past several months, during his father's retirement owing to ill health, so that the management of the business will continue the same as heretofore."—We are sorry to hear of the death of Mr. Irving Adams, whose conduct of the Company, of which he was so long President, was marked by great ability and success. If we mistake not, his son will form a worthy and admirable successor.

THE SULPHOCYANIDES AS FIXING AGENTS.

I.

Sulphocyanide of ammonium has recently being mentioned as a fixing agent for negative purposes in preference to hypo when it is desired to resort to intensification, as is frequently the case after fixing. As the sulphocyanides were tried and found wanting, as applied to positive prints, upwards of twenty years ago, it may be interesting to consider whether the circumstances differ sufficiently to warrant their use for modern negatives. At first sight it would appear, if we look at the relative solubilities of the different silver haloids in hypo and sulphocyanide of ammonium respectively, that the former should be the better agent to employ for proofs in silver chloride, and the latter where negatives or developed bromide prints are in question; but there are other circumstances to consider besides mere solubility.

The great objection to sodium hyposulphite is found in the fact of its being a sulphur compound which very readily decomposes, parting with its sulphur both in the free state as well as in various combinations of more or less doubtful character. The sulphocyanides also are sulphur compounds but it was urged in their favour, when introduced for fixing purposes, that they possess a more stable character than hypo, especially in that they do not part with sulphur in the free state. So far as the last point is concerned the claim is well founded, for, whereas sodium hyposulphite or thiosulphate almost immediately on the addition of an acid, deposits sulphur, this does not occur in the case of the sulphocyanides. But other decompositions occur both spontaneously and under the action of heat or reagents which scarcely leave the latter salts a better reputation than hypo. For instance, according to Watts the stronger acids decompose the sulphocyanides with elimination of sulphocyanic acid, and this in turn is resolved spontaneously in the cold, and more rapidly at a higher temperature into other compounds including sulphydric acid or sulphuretted hydrogen, as well as carbonic disulphide and ammonia. All the metallic sulphocyanides, we learn from the same source, are decomposed by heat with formation, amongst other compounds, of metallic sulphide.

From this it would appear that the formation of silver sulphide in imperfectly fixed or insufficiently washed films is no less likely to occur when the sulphocyanides are employed than is the case with hypo, at least with the ordinary conditions under which hypo-fixed proofs are found to fade—that is to say, under the influences of time and moisture; although it is only fair to say that, under the action of reagents, the changes that occur are not so rapid nor so apparently injurious in the case of sulphocyanide as of hypo; still the danger lurks about, and should be guarded against.

The real danger seems to us to exist, not so much in the liability of the sulphocyanides to decompose into other and dangerous compounds as to the imperfect way in which they perform the work of fixing. In the course of experiments made upwards of twenty years ago it was found that, although prints fixed with sulphocyanide retained their whiteness—*i.e.*, resisted sulphuration far better and for longer periods than others fixed with hypo, *when preserved in* the dark—yet exposure to light in a very short time caused a degradation of the high lights, showing that the prints had not been perfectly fixed, that is, had not had the whole of the unreduced silver removed from them; and this result was the same, no matter how long the fixing was continued or what strength of solution was employed. It was suggested at the time that this effect was due to the fact that the albumenate of silver, or some other organic compound, formed in the print, was not perfectly soluble in the new fixing agent; but, on the other hand, it was shown, by Mr. John Spiller, amongst others, that in this respect, so far at any rate as concerns the albumenate, that sulphocyanide was superior to hypo; yet the fact of imperfect fixation undoubtedly remains.

The Late Prince Henry of Battenburg.—The death of Prince Henry has caused quite a run on his portraits, and those who are fortunate enough to possess negatives, of recent taking, are doing a good business with them. Apart from being the husband of the Princess Beatrice, he was credited with being a very handsome man, and that, no doubt, has materially increased the demand for his portrait. It may not be generally known that the late Prince was, like some others of the Royal Family, a great lover of photography, and he had a well-appointed dark room at Windsor in which he worked.

The National Portrait Gallery.—It is announced that the First Lord of the Treasury has appointed Mr. Leslie Stephen as a Trustee of the National Portrait Gallery, which is to be opened to the public at Easter, in place of Mr. Gladstone, who resigned the post a few weeks back. It seems a pity that the Trustees cannot be induced to have a department for photographic portraits. As we have said before, in a gallery of national portraits it is the likeness of the illustrious individuals that should be one of the chief considerations, and not whether the portraits be works of art or not. Oil paintings of many who have distinguished themselves in various ways in the arts, &c., are not in existence, yet their portraits would be an acquisition to the Gallery, and photographs might be forthcoming; also, we now have permanent processes for their reproduction.

Photographic Spies.—It would appear that Venezuela is not just now a desirable place for tourist photographers, or, at least, English ones, to visit. A telegram from New York says that a correspondent of the *Herald* was arrested at La Guayra one day last week while taking photographs in the street. He was, however, subsequently released on being identified. The Judge before whom he was taken explained, as the reason for the arrest, that he was informed that many British spies were in the country for the purpose of obtaining photographs of the defences. Had the one arrested been an English traveller, instead of the correspondent of an American newspaper, he would, doubtless, have found himself in an unpleasant position. However, we surmise there are not many English photographic tourists who are likely to visit that district at present. If any do, however, let them beware, for it seems it is an offence even to photograph in the streets.

The Poisons Act Again. — The Pharmaceutical Society (Dublin) at Belfast have been prosecuting the firm of J. Lizars under their vexatious Act for selling an ounce of bichloride of mercury; but here, again, they only succeeded in obtaining nominal damages on one summons, and the two others were dismissed. The magistrates in the sister isle evidently take the same view of the Society's proceedings as do the majority of them in England. One of the features in this case was that the poison was actually sold by a duly registered pharmaceutical chemist; but the prosecution was instituted on the ground. that his employers were not pharmaceutical chemists and qualified under the Pharmacy Act (Ireland), and therefore they were said to be liable to penalties for "keeping open shop," &c. Hence it will be seen that, although the chemical branch of a business may be under the management of a duly qualified and registered chemist, that is not sufficient to relieve the employers from persecution. This is strange, because, according to the Act, in the case of the death of a chemist, any executor, or administrator, or trustee of his estate, may continue the business, provided they employ a duly qualified assistant. This is trade unionism with a vengeance. Is it not time that some agitation was instituted to obtain a repeal, or some amendment, of this obnoxious Act and the way it is administered? The thing will have to be done, and the sooner the better.

Trilby.—Visitors to the Haymarket Theatre on Monday night had a pleasant surprise in store for them in the shape of a souvenir, which was presented to every person present, from gods to pittites, to commemorate the one hundredth performance of *Trilby*. This took the form of a small portfolio containing seven beautiful photogravures, with the title, "A Souvenir of *Trilby*, by Paul M. Potter (founded on George du Maurier's novel), produced for the first time in London, at the Theatre Royal, Haymarket, on October 30, by Herbert Beerbohm Tree." Inside the cover is the original cast of *Trilby*, and then follow the photogravures. These are from negatives taken for the purpose by Mr. T. C. Turner (Turner & Drinkwater), of Hull, and that gentleman has every reason to be proud of his work. The pictures comprise a fine study of Mr. Tree as Svengali, which is followed by a most charming photograph of Miss Dorothea Baird as Trilby. The thorough manner in which this young lady looks Trilby and acts up to the character is quite wonderful. From the crown of her head to her pretty bare feet she is Trilby, and no one but Trilby. The other photogravures in this handsome souvenir are of Mr. Edward Maurice, as Taffy; Mr. Lionel Brough, as the Laird; Mr. Esmond, as Little Billee; Miss Fillippi, as Madame Vinard; and Miss Ivor and Mr. Allan, as the mother and uncle of Little Billee. The photogravures are excellently produced, presumably by Messrs. Virtue & Co., whose name is attached to the publication as printers. Should it become the custom to present audiences with such handsome books on the hundredth night of every play, such occasions will assume more importance than first nights, and quite a new opening will arise for the almost ubiquitous photographer.

Iris Diaphragms and Screen Work.—The convenience of the iris diaphragm, now so universally adapted to the better class of lenses, is beyond all question for ordinary purposes; but, when they are required for use in conjunction with the screen for half-tone work, Waterhouse stops, no doubt, offer greater facilities for the employment of openings of other than circular shape. In fact, as a diaphragm, the iris is useless except for circular apertures. But it requires the exercise of very little ingenuity to adapt lenses, so fitted, to the purpose in view with any form of diaphragm, though, perhaps, a little more trouble may be involved in changing the stops when necessary than would be the case if the usual Waterhouse slot were available. All that is necessary is to provide discs of blackened cardboard, or metal, with the desired shape of aperture, and made to fit either into the tube of the lens or its hood, the iris being kept permanently open or at its full aperture.

The best position—of course, theoretically—is in the tube of the lens, where the disc is readily kept in place, close to the iris, by means of a ring of rubber, similar to the adapters for instantaneous

shutters; but this will be found a decidedly inconvenient plan when the system of giving separate exposures with different sized stops is followed. In this case the simpler plan will be to place the diaphragm in the hood of the lens, as was formerly frequently done with portrait lenses; and, though this will necessitate a comparatively longer exposure than would be required if the same stop were fitted centrally, no other practical objection will be found, and the stops will be easily accessible when a change is necessary. With square and oblong-shaped apertures, we have not found any difference in the result produced, whether the stop is used in the body or on the hood of the lens, but we cannot speak to the effect of the more complicated shapes affected by some operators.

In using a diaphragm opening of other than circular shape, perfection of result, of course, depends as much upon the position of the stop in regard to the direction of the lines of the screen as upon anything else; for, clearly, an entirely different shape of dot would be produced when the diagonal of a square stop, or the longer dimension of an oblong one, lies in the same direction as the diagonals of the squares in the screen to what would be obtained if it were rotated through an angle of 45°. The correct position of the stop can readily be secured by carefully rotating the lens in its flange, or, better, if the stop be in the hood, by causing the latter to revolve, while the effect is watched on the focussing glass with a magnifier. If the body of the lens be revolved, it will be necessary to do the fine focussing after the position of the stop is secured.

Important Copyright Case.—Photographers often complain that, after having given permission, for a fee, for a reproduction of a picture in an illustrated paper, the block is used in other papers without permission or further fee being paid. In such cases the law will give redress, as it did one day last week. It appears that *Black and White*, the defendants, wrote to Mr. Reynolds-Stephens, the plaintiff, for permission to have a representation of his Academy picture, *In the Arms of Morpheus*, in their illustrated supplement, and in their hand-book for the Royal Academy and the New Gallery. This he consented to give for the fee of a guinea; but, instead of the picture appearing in the work for which the permission was given, it was, after a time, reproduced in an ordinary number of the paper. The plaintiff then took proceedings for damages for infringement of copyright, and an injunction to prevent any further infringement. It was stated at the trial that, had the picture been reproduced in the work for which consent had been given, it would have been an advantage to the plaintiff, but its appearing the following year in the ordinary newspaper would prejudice the chances of the picture being reproduced as a photogravure. A number of artists and print publishers were called to substantiate the plaintiff's case, and in the result the jury found that there had been an infringement, and awarded the plaintiff 100*l.* as damages.

In the forms issued by the Photographic Copyright Union there is a stipulation that the photograph for which the fee is paid is not to be used for any other purpose than that for which the permission is given and the fee paid. The above case, however, appears to show that this stipulation is really not necessary, although it makes it clearly understood that, if consent is given to reproduce a picture in one publication, it must not be used in another, even if it is not used in the one for which the permission was accorded. Photographers will, however, do well to make the stipulation, as it makes the matter quite clear to the purchaser of the right to reproduce that it is only for the purpose agreed for, and that alone.

RÖNTGEN'S DISCOVERY.

Now that the original paper by Professor Röntgen has reached us in England it is evident that the importance of his discovery cannot be at present gauged, even if we set aside altogether the somewhat curious but interesting experiments of photographing through wood and other substances. In the first place, it is obvious from Röntgen's paper that he has not rediscovered Lenard's cathodic rays, nor has he merely proved that the radiations at the ultra-violet end of the spectrum possess somewhat similar properties to those in the infra-red.

That they are not of the ultra-violet rays is surely proved by the fact that they cannot be refracted or reflected; that they are not cathodic rays is proved by their non-deflection by a magnet, and, according to Röntgen, start from that spot in the wall of the tube where the cathodic rays strike, not from the cathode itself.

A very important paper bearing upon the subject appears in the current issue of *Wiedemann's Annalen*, No. 1., 1896, p. 147, by Herr Jaumann, in which he points out that it is more than probable that the cathodic rays are longitudinal electric oscillations, as they are strongest in the axis of symmetry of the discharge space, and gradually decrease outward. Jaumann points out that the influence of the conducting wire upon cathodic rays proves that their period of vibration is of similar magnitude as the waves in the wires, that is, between 10–8 and 10–9 seconds; therefore, they are not ultra-violet rays, and further, if they were transverse without being ultra-violet, they would be ordinary light or Hertzian-waves. That the vibration of cathodic rays coincides with the direction of propagation, that is, that they are longitudinal, was proved by Lenard's experiments of their discharging influence when falling normally upon the surface of an electrode.

The essential difference between these X rays and ordinary rays will be at once seen if we recall the definition of ordinary light as vibrations of the ether particles in all directions *across* the line of propagation, or, in other words, the vibrations of ordinary light take place in every plane in succession perpendicular to the direction of the wave's motion.

That Röntgen's rays are not light in the ordinary sense of the word is obvious, and, further, his experiments prove that they are absolutely invisible to the eye even when the latter be placed close to their source.

An interesting experiment would be to try the effect of very thin plates of tourmaline on these rays, first with the optic axes of the crystals parallel, secondly with their axes at an angle of 45°, and then at right angles to see whether there is any connexion between polarised light and these new rays. E. J. WALL.

PROFESSOR RÖNTGEN'S DISCOVERY: ON A NEW KIND OF RAYS.*

[Nature.]

(1) A DISCHARGE from a large induction coil is passed through a Hittorf's vacuum tube, or through a well-exhausted Crookes' or Lenard's tube. The tube is surrounded by a fairly close-fitting shield of black paper; it is then possible to see, in a completely darkened room, that paper covered on one side with barium platino-cyanide lights up with brilliant fluorescence when brought into the neighbourhood of the tube, whether the painted side or the other be turned towards the tube. The fluorescence is still visible at two metres distance. It is easy to show that the origin of the fluorescence lies within the vacuum tube.

(2) It is seen, therefore, that some agent is capable of penetrating black cardboard which is quite opaque to ultra-violet light, sunlight, or arc-light. It is, therefore, of interest to investigate how far other bodies can be penetrated by the same agent. It is readily shown that all bodies possess this same transparency, but in very varying degrees. For example, paper is very transparent; the fluorescent screen will light up when placed behind a book of a thousand pages; printer's ink offers no marked resistance. Similarly the fluorescence shows behind two packs of cards; a single card does not visibly diminish the brilliancy of the light. So, again, a single thickness of tinfoil hardly casts a shadow on the screen; several have to be superposed to produce a marked effect. Thick blocks of wood are still transparent. Boards of pine two or three centimetres thick absorb only very little. A piece of sheet aluminium, 15 mm. thick, still allowed the X rays (as I will call the rays, for the sake of brevity) to pass, but greatly reduced the fluorescence. Glass plates of similar thickness behave similarly; lead glass is, however, much more opaque than glass free from lead. Ebonite several centimetres thick is transparent. If the hand be held before the fluorescent screen, the

* Translated by Arthur Stanton from the *Sitzungsberichte der Würzburger Physik-medic. Gesellschaft*, 1895.

shadow shows the bones darkly, with only faint outlines of the surrounding tissues.

Water and several other fluids are very transparent. Hydrogen is not markedly more permeable than air. Plates of copper, silver, lead, gold, and platinum also allow the rays to pass, but only when the metal is thin. Platinum ·2 mm. thick allows some rays to pass; silver and copper are more transparent. Lead 1·5 mm. thick is practically opaque. If a square rod of wood 20 mm. in the side be painted on one face with white lead, it casts little shadow when it is so turned that the painted face is parallel to the X rays, but a strong shadow if the rays have to pass through the painted side. The salts of the metals, either solid or in solution, behave generally as the metals themselves.

(3) The preceding experiments lead to the conclusion that the density of the bodies is the property whose variation mainly affects their permeability. At least no other property seems so marked in this connexion. But that the density alone does not determine the transparency is shown by an experiment wherein plates of similar thickness of Iceland spar, glass, aluminium, and quartz were employed as screens. Then the Iceland spar showed itself much less transparent than the other bodies, though of approximately the same density. I have not remarked any strong fluorescence of Iceland spar compared with glass (see below, No. 4).

(4) Increasing thickness increases the hindrance offered to the rays by all bodies. A picture has been impressed on a photographic plate of a number of superposed layers of tinfoil, like steps, presenting thus a regularly increasing thickness. This is to be submitted to photometric processes when a suitable instrument is available.

(5) Pieces of platinum, lead, zinc, and aluminium foil were so arranged as to produce the same weakening of the effect. The annexed table shows the relative thickness and density of the equivalent sheets of metal:—

	Thickness.	Relative thickness.	Density.
Platinum.....	·018 mm.	1	21·5
Lead.....	·050 „	3	11·3
Zinc.....	·100 „	6	7·1
Aluminium	3·500 „	200	2·6

From these values it is clear that in no case can we obtain the transparency of a body from the product of its density and thickness. The transparency increases much more rapidly than the product decreases.

(6) The fluorescence of barium platinocyanide is not the only noticeable action of the X rays. It is to be observed that other bodies exhibit fluorescence, *e.g.*, calcium sulphide, uranium glass, Iceland spar, rock salt, &c.

Of special interest in this connexion is the fact that photographic dry plates are sensitive to the X rays. It is thus possible to exhibit the phenomena so as to exclude the danger of error. I have thus confirmed many observations, originally made by eye observation with the fluorescent screen. Here the power of the X rays to pass through wood or cardboard becomes useful. The photographic plate can be exposed to the action without removal of the shutter of the dark slide or other protecting case, so that the experiment need not be conducted in darkness.

Manifestly, unexposed plates must not be left in their box near the vacuum tube.

It seems now questionable whether the impression on the plate is a direct effect of the X rays, or a secondary result induced by the fluorescence of the material of the plate. Films can receive the impression as well as ordinary dry plates.

I have not been able to show experimentally that the X rays give rise to any calorific effects. These, however, may be assumed, for the phenomena of fluorescence shows that the X rays are capable of transformation. It is also certain that all the X rays falling on a body do not leave it as such.

The retina of the eye is quite insensitive to these rays; the eye placed close to the apparatus sees nothing. It is clear from the experiments that this is not due to want of permeability on the part of the structures of the eye.

(7) After my experiments on the transparency of increasing thicknesses of different media, I proceeded to investigate whether the X rays could be deflected by a prism. Investigations with water and carbon bisulphide in mica prisms of 30° showed no deviation either on the photographic or the fluorescent plate. For comparison, light rays were allowed to fall on the prism as the apparatus was set up for the experiment. They were deviated 10 mm. and 20 mm. respectively in the case of the two prisms.

With prisms of ebonite and aluminium I have obtained images on the photographic plate which point to a possible deviation. It is, however, uncertain, and at most would point to a refractive index 1·05. No deviation can be observed by means of the fluorescent screen. Investigations with the heavier metals have not as yet led to any result, because of their small transparency and the consequent enfeebling of the transmitted rays.

On account of the importance of the question it is desirable to try in other ways whether the X rays are susceptible of refraction. Finely powdered bodies allow, in thick layers, but little of the incident light to pass through, in consequence of refraction and reflection. In the case of the X rays, however, such layers of powder are for equal masses of substance equally transparent with the coherent solid itself. Hence we cannot conclude any regular reflection or refraction of the X rays. The research was conducted by the aid of finely powdered rock salt, fine electrolytic silver powder, and zinc dust already many times employed in chemical work. In all these cases the result, whether by the fluorescent screen or the photographic method, indicated no difference in transparency between the powder and the coherent solid.

It is, hence, obvious that lenses cannot be looked upon as capable of concentrating the X rays; in effect, both an ebonite and a glass lens of large size proved to be without action. The shadow photograph of a round rod is darker in the middle than at the edge; the image of a cylinder filled with a body more transparent than its walls exhibits the middle brighter than the edge.

(8) The preceding experiments, and others which I pass over, point to the rays being incapable of regular reflection. It is, however, well to detail an observation which at first sight seemed to lead to an opposite conclusion.

I exposed a plate, protected by a black paper sheath, to the X rays, so that the glass side lay next to the vacuum tube. The sensitive film was partly covered with star-shaped pieces of platinum, lead, zinc, and aluminium. On the developed negative the star shaped impression showed dark under platinum, lead, and, more markedly, under zinc; the aluminium gave no image. It seems, therefore, that these three metals can reflect the X rays; as, however, another explanation is possible, I repeated the experiment, with this only difference, that a film of thin aluminium foil was interposed between the sensitive film and the metal stars. Such an aluminium plate is opaque to ultra-violet rays, but transparent to X rays. In the result the images appeared as before, this pointing still to the existence of reflection at metal surfaces.

If one considers this observation in connexion with others, namely, on the transparency of powders, and on the state of the surface not being effective in altering the passage of the X rays through a body, it leads to the probable conclusion that regular reflection does not exist, but that bodies behave to the X rays as turbid media to light.

Since I have obtained no evidence of refraction at the surface of different media, it seems probable that the X rays move with the same velocity in all bodies, and in a medium which penetrates everything, and in which the molecules of bodies are embedded. The molecules obstruct the X rays, the more effectively as the density of the body concerned is greater.

(9) It seemed possible that the geometrical arrangement of the molecules might affect the action of a body upon the X rays, so that, for example, Iceland spar might exhibit different phenomena according to the relation of the surface of the plate to the axis of the crystal. Experiments with quartz and Iceland spar on this point lead to a negative result.

(10) It is known that Lenard, in his investigations on kathode rays, has shown that they belong to the ether, and can pass through all bodies. Concerning the X rays the same may be said.

In his latest work Lenard has investigated the absorption coefficients of various bodies for the cathode rays, including air at atmospheric pressure, which gives 4·10, 3·40, 3·10 for 1 cm., according to the degree of exhaustion of the gas in discharge tube. To judge from the nature of the discharge, I have worked at about the same pressure, but occasionally at greater or smaller pressures. I find, using a Webber's photometer, that the intensity of the fluorescent light varies nearly as the inverse square of the distance between screen and discharge tube. This result is obtained from three very consistent sets of observations at distances of 100 and 200 mm. Hence air absorbs the X rays much less than the cathode rays. This result is in complete agreement with the previously described result, that the fluorescence of the screen can be still observed at 2 metres from the vacuum tube. In general, other bodies behave like air; they are more transparent for the X rays than for the cathode rays.

(11) A further distinction, and a noteworthy one, results from the action of a magnet. I have not succeeded in observing any deviation of the X rays even in very strong magnetic fields.

The deviation of cathode rays by the magnet is one of their peculiar

characteristics; it has been observed by Hertz and Lenard, that several kinds of cathode rays exist, which differ by their power of exciting phosphorescence, their susceptibility of absorption, and their deviation by the magnet; but a notable deviation has been observed in all cases which have yet been investigated, and I think that such deviation affords a characteristic not to be set aside lightly.

(12) As the result of many researches, it appears that the place of most brilliant phosphorescence of the walls of the discharge tube is the chief seat whence the X rays originate and spread in all directions; that is, the X rays proceed from the front where the cathode rays strike the glass. If one deviates the cathode rays within the tube by means of a magnet, it is seen that the X rays proceed from a new point, *i.e.*, again from the end of the cathode rays.

Also for this reason the X rays, which are not deflected by a magnet, cannot be regarded as cathode rays which have passed through the glass, for that passage cannot, according to Lenard, be the cause of the different deflection of the rays. Hence I conclude that the X rays are not identical with the cathode rays, but are produced from the cathode rays at the glass surface of the tube.

(13) The rays are generated not only in glass. I have obtained them in an apparatus closed by an aluminium plate 2 mm. thick. I purpose later to investigate the behaviour of other substances.

(14) The justification of the term "rays," applied to the phenomena, lies partly in the regular shadow pictures produced by the interposition of a more or less permeable body between the source and a photographic plate or fluorescence screen.

I have observed and photographed many such shadow pictures. Thus, I have an outline of part of a door covered with lead paint; the image was produced by placing the discharge tube on one side of the door, and the sensitive plate on the other. I have also a shadow of the bones of the hand, of a wire wound upon a bobbin, of a set of weights in a box, of a compass card and needle completely enclosed in a metal case, of a piece of metal where the X rays show the want of homogeneity and of other things.

For the rectilinear propagation of the rays, I have a pinhole photograph of the discharge apparatus covered with black paper. It is faint, but unmistakable.

(15) I have sought for interference effects of the X rays, but possibly, in consequence of their small intensity, without result.

(16) Researches to investigate whether electrostatic forces act on the X rays are begun, but not yet concluded.

(17) If one asks, What, then, are these X rays; since they are not cathode rays, one might suppose, from their power of exciting fluorescence and chemical action, them to be due to ultra-violet light? In opposition to this view, a weighty set of considerations presents itself. If X rays be indeed ultra-violet light, then that light must possess the following properties:—

(*a*) It is not refracted in passing from air into water, carbon bisulphide, aluminium, rock salt, glass, or zinc.

(*b*) It is incapable of regular reflection at the surfaces of the above bodies.

(*c*) It cannot be polarised by any ordinary polarising media.

(*d*) The absorption by various bodies must depend chiefly on their density.

That is to say, these ultra-violet rays must behave quite differently from the visible, infra-red, and hitherto known ultra-violet rays.

These things appear so unlikely that I have sought for another hypothesis.

A kind of relationship between the new rays and light rays appears to exist; at least the formation of shadows, fluorescence, and the production of chemical action point in this direction. Now, it has been known for a long time that, besides the transverse vibrations which account for the phenomena of light, it is possible that longitudinal vibrations should exist in the ether, and, according to the view of some physicists, must exist. It is granted that their existence has not yet been made clear, and their properties are not experimentally demonstrated. Should not the new rays be ascribed to longitudinal waves in the ether?

I must confess that I have in the course of this research made myself more and more familiar with this thought, and venture to put the opinion forward, while I am quite conscious that the hypothesis advanced still requires a more solid foundation. PROFESSOR W. C RÖNTGEN.

In regard to Professor Röntgen's discovery, Mr. A. A. C. Swinton writes in *Nature*:—

Working upon the lines indicated in the telegrams from Vienna recently published in the daily papers, I have with the assistance of Mr J. C. M. Stanton, repeated many of Professor Röntgen's experiments with entire success. According to one of our first experiments, an ordinary gelatinous bromide dry photographic plate was placed in an ordinary camera back. The wooden shutter of the back was kept closed, and upon it were placed miscellaneous articles, such as coins, pieces of wood, carbon, ebonite, vulcanised fibre, aluminium, &c., all being quite opaque to ordinary light. Above was supported a Crookes tube, which was excited for some minutes. On development, shadows of all the articles placed on the slide were clearly visible, some being more opaque than others. Further experiments were tried with thin plates of aluminium or of black vulcanised fibre interposed between the objects to be photographed and the sensitive surface, this thin plate being used in place of the wood of the camera back. In this manner sharper shadow pictures were obtained. While most thick metal sheets appear to be entirely opaque to the radiations, aluminium appears to be relatively transparent. Ebonite, vulcanised fibre, carbon, wood, cardboard, leather, and slate are all very transparent, while, on the other hand, glass is exceedingly opaque. Thin metal foils are moderately opaque, but not altogether so.

As tending to the view that the radiations are more akin to ultra-violet than to infra-red light, it may be mentioned that a solution of alum in water is distinctly more transparent to them than a solution of iodine in bisulphide of carbon.

So far as our own experiments go, it appears that, at any rate without very long exposures, a sufficiently active excitation of the Crookes tube is not obtained by direct connexion to an ordinary Rhumkorff induction coil, even of a large size. So-called high-frequency currents, however, appear to give good results, and our own experiments have been made with the tube excited by current obtained from the secondary circuit of a Tesla oil coil, through the primary of which were continually discharged twelve half-gallon Leyden jars, charged by an alternating current of about 20,000 volts' pressure, produced by a transformer with a spark gap across its high-pressure terminals.

For obtaining shadow photographs of inanimate objects, and for testing the relative transparency of different substances, the particular form of Crookes tube employed does not appear to greatly signify, though some forms are, we find, better than others. When, however, the human hand is to be photographed, and it is important to obtain sharp shadows of the bones, the particular form of tube used, and its position relative to the hand and sensitive plate, appear to be of great importance. So far, owing to the frequent destruction of the tubes, due to overheating of the terminals, we have not been able to ascertain exactly the best form and arrangement for this purpose, except that it appears desirable that the electrodes in the tube should consist of flat and not curved plates, and that these plates should be of small dimensions.

The accompanying photograph of a living human hand was exposed for twenty minutes through an aluminium sheet ·0075 in thickness, the Crookes tube, which was one of the kind containing some white phosphorescent material (probably sulphide of barium), being held vertically upside down, with its lowest point about two inches above the centre of the hand.

By substituting a thin sheet of black vulcanised fibre for the aluminium plate, we have since been able to reduce the exposure required to four minutes. Indeed, with the aluminium plate the twenty minutes' exposure appears to have been longer than was necessary. Further, having regard to the great opacity of glass, it seems probable that, where ordinary Crookes tubes are employed, a large proportion of the active radiations must be absorbed by the glass of the tube itself. If this is so, by the employment of a tube partly constructed of aluminium, as used by Lenard, the necessary length of exposure could be much reduced.

A. A. C. SWINTON.

ON A NEW METHOD OF PREPARING PLATES SENSITIVE TO THE ULTRA-VIOLET RAYS.*

[Communicated by Colonel J. Waterhouse, I.S.C.]

IT frequently happens that, for various experimental purposes, plates with a sensitive surface of pure silver bromide, or bromo-iodide, are required, and are not always easy to prepare. Some few years ago, Herr V. Schumann reported that he had found a means of preparing plates sensitive to the ultra-violet rays in regions hitherto quite unrecorded by photography. The full details of Herr Schumann's method of preparing these plates have now appeared in the Transactions of the Vienna Academy of Sciences, and present so many points of interest, and show

* Translated from the *Sitzungsbericht der Kaiserlichen Akademie der Wissenschaften, Math-Naturwiss. Classe.* Band cii. Heft. 8, Wien, October, 1893, pp. 994-1024,

such thorough working out by Herr Schumann, that a translation of the paper seemed desirable. It was intended originally to be merely an abstract for my own use, but it was found very difficult to condense it without loss. The paper forms the sequel of two papers on the "Photography of the Rays of Shortest Wave-length," published in the same volume of the *Sitzungsberichte* (pages 415–475 and 625–694), which deal with the instruments and the necessary optical and electrical arrangements for taking these photographs of the region of the spectrum between w. l. 231·35 and 100·0 $\mu\mu$, and the many difficulties to be surmounted in doing so, especially in the case of the wave-lengths between 182 $\mu\mu$ and 100 $\mu\mu$, for which entirely special arrangements had to be adopted.—J. W.

Introduction.

In my previous papers (noted above), I have followed out the spectrum of electric discharges far beyond the hitherto known limits of the ultra-violet (185·2 $\mu\mu$), up to the neighbourhood of wave-length 100 $\mu\mu$. The observations were carried out by photographic methods as far as w. l. 182 $\mu\mu$ with gelatino-bromide plates, and thence to w. l. 100 $\mu\mu$, with a plate which I prepared specially for this purpose by a new method.

The rays beyond w. l. 182 $\mu\mu$ have remained quite inactive by any method of spectroscopic observation hitherto employed. They are only perceptible with the above-mentioned plates, with lenses and prisms of fluor spar, and with the spectroscopic apparatus in a vacuum.

The method of preparation of these plates is the result of a research not yet finished, which I only noticed briefly in the first part of the papers mentioned. It yields a coating for the plates of the desired fineness and sensitiveness, films which are more sensitive for the new rays than for the remaining part of the spectrum, and which, on this account, as I shall show later on, fulfil their purpose in two ways.

The plates are less satisfactory in other respects; they suffer in time from large and small defects in the surface, which can only be checked by proper exposure and by skilful application of definite precautionary measures for the development of the image. But, as soon as this precaution is put aside, numberless spots appear of different intensity and size which overrun the image and destroy its otherwise so remarkable sharpness. This is the direction in which my process requires improvement, and is, at the same time, the principal reason why I have not published it earlier. I certainly hope still to be able to overcome this defect, as a result of further researches, if more time is available to me for them, as my earlier observations lead me to believe.

Under such circumstances, it might have happened that the free publication of my process, which I had not intended until this improvement had been made, would have been indefinitely postponed; but this would not have agreed with the final object of my investigations, which was to make the spectroscopy of the new region of rays accessible as soon as possible.

The following circumstances have also influenced me:—The above-mentioned account of my researches on the shortest wave-lengths has, since its appearance met with such a friendly reception, that a more active interest in the investigation of the new region of rays seems to have already been secured. This is shown especially by the efforts that are being directed to the problem of extending our knowledge of the molecular theory by means of the spectrum. It may be remarked thereon, that the earlier researches in this direction, which first of all only aimed at the discovery of a regular connexion between the lines of an element and between the spectra of different elements have, up to the present time, given the most favourable results the nearer they have approached the hitherto known boundaries of the ultra-violet region. The shorter the wave-lengths of the region under observation were, so much the more markedly this regularity was disclosed. From this it may be expected that the new region of rays, with its incomparably shorter wave-lengths, will yield rich material for observation towards the completion, as well as for the verification of the results hitherto obtained; and so much the more that the investigation of a whole series of elements, which has hitherto been quite without result in the direction mentioned, is directed on this part of the spectrum alone. For observations of this kind the new plates, even before their improvement, should be a welcome help. It is this especially which has, in the first place, decided me to abandon my original intention and publish my process at once.

The following paper treats of my own personal labours. These include a series of researches which, in consequence of the not inconsiderable difficulties which were caused at first by the necessity for taking these pictures of the spectrum in a vacuum, have occasioned great expenditure of time and trouble. I have, therefore, contented myself with single trials of the respective experiments in cases where the verifying of the first results seemed to me superfluous. These results are naturally of inferior value, and it might, perhaps, have been better if I had passed them over in silence. My paper would then have been so incomplete, that their admission into it seemed to me to be the least of two evils. I shall, however, suitably note them in what follows, so that the possibly doubtful worth of one or the other of them may not influence the principal results of the investigation.

Spectrographic Preparatory Work.

The spectrum in the ultra-violet was already known as far as w. l. 185·2 $\mu\mu$. In 1890 I succeeded in discovering waves of shorter length as far as w. l. 182 $\mu\mu$ by means of photography. Beyond this the photographic plates failed; whether from want of sensitiveness or from the insufficient energy of the source of light, nothing further could be determined. The only possibility of obtaining an elucidation of this point lay in the measurement of the transparency to light of the different components of the sensitive coating of the plates. I used for this purpose gelatine dry plates containing gelatine and silver bromide.

Dry gelatine, as I was the first to show,* absorbs the ultra-violet rays very powerfully, and the more so in proportion to their refrangibility. A film only 0·00004 mm. thick is sufficient to weaken very sensibly rays of about w. l. 185·2 $\mu\mu$.

The coating of a gelatine dry plate is at least 500 times thicker. Consequently, waves of shorter length have not the power of penetrating the sensitive depths of such a film, or of reducing a sufficient quantity of silver haloid, to give a dense image. From this it may be concluded that the gelatine was not without a share in the loss of intensity of my pictures of the spectrum, and that a film of pure silver bromide might have given a better effect.

Pure silver bromide also stops the rays of light energetically; however, according to my photographs, it is rather more transparent for the wave-lengths 210 $\mu\mu$ to 185 $\mu\mu$, than for the rest of the spectrum. This slight difference was practically of little importance. Of much more importance was the extent of the extinction which might result photo-chemically or photo-thermically. The absorption spectrum failed to elucidate this point. The photographic behaviour of pure silver bromide could alone decide it.

With this object I coated a glass plate with a thin film of silver bromide, which had been precipitated with an excess of alkaline bromide, dried it, and with it took a photograph of the spectrum of the spark between two aluminium wires, using a quartz prism and lenses. The plate was developed like a gelatine dry plate, with pyrogallic acid, soda, and potassium bromide. The thickly fogged plate showed a continuous spectrum, which extended as far as wave-length 182 $\mu\mu$ in undiminished intensity, as a deep black band of action, bordered all round by a light edge. The continuity of this band was entirely owing to the spreading of all the lines together, an appearance which also occurs with gelatine plates of much higher sensitiveness.

From this negative I concluded that the modification of silver bromide in gelatine emulsion is not wanting in any way in sensitiveness for the most refrangible rays, nor these in photo-chemical energy, but rather that the want of sensitiveness of silver bromide in gelatine was a consequence of the weakening of the rays which these suffer on their passage to the silver bromide through the gelatine. Hence, it was to be expected that the sensitiveness of silver bromide plates could be increased by diminishing the quantity of gelatine, by substituting some more transparent binding medium for the gelatine, or, finally, by doing away with the binding material. This would only answer for the selected region of observation which ends with wave-length 182 $\mu\mu$. I therefore repeated these experiments for the more strongly refracted region lying near, taking care, however, to reduce the air space between the source of light and the plate, which I had already previously recognised as an important absorbent for short waves of light, to a layer of only a few millimetres thickness. In this way it was proved that a region rich in rays existed beyond 182 $\mu\mu$, and also that, for photographing, this pure silver bromide is sufficiently sensitive.

These photographs on pure silver bromide form the basis for the preparation of my plates sensitive to the ultra-violet rays, which is treated in the following section of this paper.

Preparation of Plates Sensitive to the Ultra-violet Rays.

This was tried in three ways—by coating with emulsion, by bathing in silver nitrate and potassium bromide solutions, and by coating with precipitated silver bromide.

A.—By Coating with Emulsion.

My endeavours to obtain an ultra-violet sensitive plate with emulsions

* See vol. cii. part 2, 1893, pp. 457–464.

of silver bromide have given no practical results. They are only mentioned for the sake of completeness.

I hoped, with a silver bromide emulsion containing two to three times as much silver bromide as usual, to obtain a coating poor in gelatine which would have allowed the rays to penetrate to a greater depth and given a more intense picture than is possible with ordinary silver bromide in gelatine. I obtained, however, the exact reverse of this. The silver bromide settled regularly at the bottom, even before the poured-out emulsion was set, so that the uppermost surface of the coating of the plate, which in this case is alone of service, consisted merely of gelatine. Plates of this kind were, from the reasons already explained, more insensitive for the most refrangible rays than ordinary dry plates.

An attempt to replace gelatine by agar-agar was still more unsuccessful: the coating of the plate separated, as soon as it was set, into particles, of varying sizes, an appearance which had already, some years before, prevented me from using agar-agar for emulsion purposes.

B.—By Immersion in Silver Nitrate and Potassium-bromide Solutions.

If a plate coated with gelatine is dipped in a solution of silver nitrate and then in a solution of potassium bromide, a coating of silver bromide is obtained, of which the outer surface is formed of silver bromide without any gelatine. When such a plate is exposed to light, the rays pass first through the silver bromide free from gelatine, and then through that which is enclosed in gelatine. From this film of silver bromide free of gelatine, I anticipated good results in photographing the smallest wave-lengths.

I coated a levelled glass plate with a three per cent. solution of gelatine, and, as soon as the coating was set, immersed it in a five per cent. solution of silver nitrate, let it drain, cleaned back and sides with blotting-paper, then immersed it again in the dark room in a three per cent. solution of potassium bromide, and washed it, the coated side being downwards and the water changed constantly. After drying, it was exposed to the spectrum of aluminium, and then developed with pyro-soda and potassium bromide.

The dried opalescent unexposed plates were found to be unevenly transparent, and showed numerous irregular streaks. They fogged completely on development, and could only be kept clear by strongly diluting the developer. However, the lines were in all cases sharply shown, even when the plate fogged, and more intense than with a silver bromide emulsion. The photographic maximum of the plate exposed to aluminium light was about the two lines at 186·0 $\mu\mu$ and 185·2 $\mu\mu$. Both always developed much earlier than the other parts of the spectrum.

Gelatine emulsion plates behaved just the opposite, these lines always appearing last.

Gelatine bath plates consequently have an advantage over emulsion plates for photographing the most refrangible rays.

These photographs ended at wave-length 185·2 $\mu\mu$. The cause of this moderate range must be sought, however, not in the plate, but rather much more in the fact that its exposure was under the influence of an air space intervening in the path of the rays, and this, as before shown, is very slightly transparent to the ultra-violet rays.

The general sensitiveness of the gelatine bath plates was only moderate, and to have increased it, as was desirable, would have been difficult. I therefore contented myself with a single trial of this method, and, without exposing plates to the wave-lengths beyond wave-length 185·2 $\mu\mu$, passed on to the last of the methods given, which, in other respects also, promised better results.

C. By Coating with Precipitated Silver Bromide.

If solutions of silver nitrate and potassium bromide are mixed, a flocculent precipitate of silver bromide is obtained. Very dilute solutions behave otherwise. They give, with an excess of potassium bromide, an extremely fine precipitate, which first remains suspended, and only settles after standing for weeks.

The addition of a few drops of ammonia increases the deposit, and hastens the settling.

If a glass plate be laid at the bottom of the settling vessel, the silver bromide falls on it in a layer of even thickness, and, after the supernatant fluid has been syphoned off, dries in a short time to a dull yellowish coating, consisting of pure silver bromide, with a small mixture of the salts dissolved in the supernatant fluid (KNO_3 and KBr), which can be removed by washing. Such plates stand development, and also, to a certain extent, the fixing, without injury.

The above is a rough outline of the method I have used for years for preparing plates, which have enabled me to find the limits of the spectrum between wave-lengths 182 $\mu\mu$ and 100 $\mu\mu$. V. Schumann.

WINTER PHOTOGRAPHY.

[West London Photographic Society.]

My first duty this evening is to disclaim any pretensions whatever to the qualifications necessary for dealing in an instructive manner with the subject of Winter Photography.

As a matter of fact, not only was our Secretary good enough to allot me a vacant date in the syllabus, but he also kindly supplied me with the title for a paper, and instructions to proceed with the subject. Under the circumstances, the following remarks must not be taken as in any sense authoritative, but merely as a basis for discussion.

Winter photography is so general and comprehensive a term, that one might be expected to have something to say on every branch and phase of photographic work usual or possible during the winter season.

I have, however, found that to deal in a general way with the production by amateur workers of negatives and prints during the winter, and of wintry subjects, would be quite sufficient for one evening.

Obviously, then, the first point to be considered is, What preparations are necessary for outdoor work during the winter. One of the most important is to be sure of a supply of plates or films ready for immediate use, and it will frequently be found desirable to have the plate-holders already filled, so that not a minute may be lost indoors when the time for action comes. This is true even when applied to persons having plenty of leisure, and who are free to seize any opportunity that may present itself; much more so is it important for those whose time is principally occupied by business or professional duties. Perhaps it need hardly be stated that one reason for being constantly ready is, that many of the most beautiful effects of winter weather appear very suddenly in this country, and frequently last a few hours only. This is especially the case with hoar frost or rime, and not infrequently a fall of snow is quickly followed by genial sunshine, which causes the snow to fall from the trees, whilst that covering the ground loses its beautiful fleecy texture.

A precaution said to be especially necessary for securing the best rendering of snow scenes is to have the lens surfaces perfectly free from dust. Mr. F. M. Sutcliffe calls attention to this; he also urges the use of a single lens with a fixed stop in front, or, if using a doublet, that some precaution should be taken to shade the lens on the under side from the glare of a bright snow scene.

Personally, I had noticed that such subjects were more difficult to get clear and sharp than an ordinary landscape, and have been in the habit of using a much smaller stop than at other times. I am not, however, prepared to say that my practice is as effective as that advised by Mr. Sutcliffe—probably it is not.

In working among masses of ice such as may at times be found on the shores of a tidal river, it will be found an advantage to have the spikes of the tripod sharpened up to a fine point, so as to get a firm hold on the surface of ice.

On such occasions I have found as a makeshift a piece of stout string useful for fastening the tripod legs to one another at about mid-length, to prevent them spreading on the slippery surface.

Some uncertainty has, no doubt, been felt as to the best plate or film for winter work, and as to whether any particular plate is better than another. On this point I prefer not to ask you to rely on my own experience entirely, but will add the views of such authorities as I found handy when preparing these remarks.

Of the utility of backing all plates there can be no question, as, without doubt, some of the most beautiful effects are most trying, owing to extreme contrasts; neither can there be any excuse for not doing so since the advent of specially prepared backing paper at a very low price. My own recent practice has been to use films only, which do not appear to need backing.

As to the rapidity of plate, I have always used a medium or rapid plate, and I find that the practice is in agreement with the results of experiments made for the purpose of ascertaining what class of plates was least affected by low temperatures. It will be evident that a thickly coated plate or film is very desirable for the proper rendering of great extremes of light and shade.

This brings us to the consideration of a point of some interest from its scientific aspect, but which, I venture to think, is not of so much practical importance as some would have us believe. I refer to the influence of temperature on the sensitiveness of the gelatino-bromide plate. My own opinion—which, at best, must be considered as merely the result of observations in practical working—is that temperature, in this country at any rate, need not be seriously taken into account.

However, we will consider what has been proved by scientific research, and leave its practical applications to the judgment of individual workers. Professor Dewar was an early experimenter with photographic plates at temperatures far below anything known to exist outside of a chemical laboratory, and which he describes, in a lecture at the Royal Society, as "a temperature by the side of which the arctic regions would appear like the plains of India." He also said that "he had been puzzled to find that, whereas other chemical action ceased, photographic action, although considerably diminished, still went on. The impression on a chilled film was less by about eighty per cent. than that left on a film at ordinary temperature, but there it was."

I think you will all agree that a loss of eighty per cent. of sensitiveness at such a temperature as −180° C., or 292° below zero Fahr., conveys no idea of practical value to those working in ordinary winter weather.

Another experimenter, Dr. J. Joly found that the effect of difference of temperature was much more marked on an isochromatic plate than upon a plain silver bromide plate. His experiments also showed that practically the isochromatic plate was reduced by cold to the limits of sensitiveness of the undyed plate, and that, under conditions of extreme cold, isochromatic plates possess but little advantage in colour correctness over ordinary plates. G. F. Blackmore.

(To be continued.)

THE TRAILL TAYLOR MEMORIAL.

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THE SOLAR CORONA PHOTOGRAPHED IN DAYLIGHT.

Mr. D. E. Packer, of the Astrophysical station, South Birmingham, writes to the *English Mechanic*:—

"From innumerable experiments made during the last six months, it has been found that metallic plates, foils, and films are relatively transparent to solar radiance of high refrangibility, and that photographic plates screened by such media during exposure to direct sunlight are affected in proportion to the thinness and electrical conductivity of the interposed screen.

"This interesting discovery has been successfully employed in photographing the solar corona. The results obtained are so remarkable, and the recorded coronal changes so great and rapid, that great caution had to be exercised till a sufficient mass of confirmatory evidence could be obtained to justify this announcement. The photographs secured range from 1895, July 3 to December 15, on which latter date Comet Perrine is also shown very close to its calculated place.

"The earlier photographs were taken with cameras of 4 inch and 1 inch aperture; the metallic screens employed were tin and lead foil and sheet copper. Prominent equatorial extensions over the region of active sunspot groups are the chief features of these pictures.

"By far the most remarkable coronal photographs were obtained without any camera lens at all, merely a small, neat pinhole aperture being used. These show, in some instances, an astonishing wealth of detail, more sharply defined, and of greater extent, and agreeing, in the more prominent features, with ordinary camera exposures taken at the same time. This agreement was invariably found to exist—a proof of the objective reality of the phenomena.

"It is well known that the absorption by glass lenses of the rays of higher refrangibility increases rapidly beyond the H and K lines of the spectrum, until opacity is reached. Lenses of quartz or rock crystal are known to possess a far greater transparency to these ultra-violet rays; but a small, clear aperture (pinhole) is obviously the best of all, as it transmits rays of every degree of refrangibility entirely unaffected; hence the superiority of photographs taken by such means over ordinary camera exposures.

"A preliminary discussion of the photographs show clearly the following characteristics:—

"1. A very close and intimate connexion with contemporary sunspots and sunspot groups. Active spot groups, especially when near the limb, are indicated by enormous coronal radiations over the particular region of activity, the coronal changes synchronising with the sunspot changes. It may be regarded as an axiom that 'every sunspot has its coronal ray,' as every prominent radiation may be easily assigned to its particular spot to which it invariably points. This remarkable association was unexpected at first; hence I neglected to note the spot configurations on the sun's disc, and several puzzling appearances on several of the more important photographs gave rise to doubts, which have been in great part dissipated by reference to Miss E. Brown's important paper on 'The Sunspots of the Last Year' (1894–5), *Journal B.A.A.*, vol. vi., p. 15, which has helped to explain several of the appearances. It has been found necessary to pay particular attention to the sunspot appearances on every occasion when photographs have been taken, which has been rewarded by repeated confirmation of this newly discovered association.

"2. That the well-known typical spot-minimum and spot-maximum coronal phases alternate pretty rapidly, apparently synchronising with observed short-period phases of spot activity and quiescence.

"3. That many of the most prominent radiations exhibit a decided helical structure, two or three convolutions, in some instances, being distinctly traceable—a surprising and unexpected feature.

"4. The great photographic strength of the coronal rays as compared with the feeble image of the solar disc, which has given rise to the inference that the coronal radiations are the chief source of the electrical energy from our central orb."

The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* Journal *useful and instructive.*

Acetylene Gas Generator (To Mr. Thompson).—Messrs. F. S. Thorn & Co. write: "Seeing Mr. Thompson's inquiry, *re* Acetylene Gas Generator, of the 17th inst., may we state that we are manufacturing a simple generator suitable for the lantern, or enlarging purposes. It is quite safe and automatic in action, and gives from two to three hours light with one charge of calcium carbide."

Collodion Emulsion (To Mr. E. Banks).—J. Hampton says: "I have made up five ounces of collodion-emulsion (see The British Journal Photographic Almanac). Mr. Banks says add bichromate, after add cadmium bromide till the red colour is gone. I added a little at a time to the cadmium till I have used about one ounce, and I find that after the emulsion stands about one hour, there forms at the top of the emulsion a layer the colour of a deep buff. I should like you to kindly tell me about how much bromide to add to get the emulsion right. I may add that I can get a negative as it is now. The lower part of the emulsion is the colour of a warm grey, after standing."

Acetylene.—E. W. B. writes as follows: "We have heard a great deal about the wonders that are to be expected from the new acetylene gas, but more especially its cheapness as compared with ordinary coal gas; but on reading Mr. Edwin Banks's very interesting article in the last number of The Lantern Record, I find it difficult to reconcile his statements with the expectations held out by others. The price of the calcium carbide is variously quoted at from about 2*s.* 6*d.* a pound to 6*d.*, or, as Mr. Banks says, at 2¾*d.* per pound by the ton. Taking even this estimate as being the correct one when the stuff is properly on the market, and allowing that the new gas gives much more light, volume for volume, than the old, I cannot even then see how five cubic feet—the quantity stated by Mr. Banks to be obtainable from one pound of the carbide—costing 2¾*d.* can compete with coal gas at, say, 2*s.* 6*d.* per thousand. Is there not some mistake somewhere?"—We are not aware what volume of the gas has been obtained practically from a given weight of the carbide; but, supposing the latter to be chemically pure, which, of course, the commercial article is not, and calculating from its chemical composition and the specific gravity of the gas, the product should be nearer five hundred than five cubic feet per pound. Perhaps some of our chemical readers may have had practical experience in this direction, and be able to throw more light on the question.

NON-FUGITIVE DYES.—L. M. FRAZER writes: "Regarding *Dyes and Photographic Mordants* in December 27 number, could you inform me of three dyes, blue, red, and yellow, which would not fade in the sunlight? I have tried Judson's and find a day in sunlight fades them badly. If three pure primary tints could be had, others could be made from them."

COMMERCIAL PRINTING.—PHOTOGRAPHER asks the following question: "What is about the average number of frames a photographic printer (and a boy to assist in changing, &c.) would be required to keep going, including fitting up, &c., the greater part of which would be vignetted? Also about the number of prints they should get off between nine o'clock in the morning and three in the afternoon, allowing an hour, each of them, for dinner, taking a bright day as an example?"—Possibly some reader, who has had more experience with commercial printing than we have, will give his ideas.

RATIONAL DEVELOPMENT.—Writing *apropos* of the development query in this column a fortnight ago, J. C. says: "Such formulæ as the one referred to, in which one ounce of pyro is to be dissolved in eighty ounces of water, are absolutely ridiculous for practical purposes, unless in establishments where that quantity of pyro is used in a few hours, and even then it might be more conveniently employed in a more concentrated condition. The quantities of sulphite and of sulphuric acid are totally inadequate to preserve the pyro in that dilute state, though sufficient of the volume of solution be reduced to one-fourth or one-fifth; but then the only convenience of such a formula disappears, namely, the simple mixture of equal parts for use. The disadvantage of the system lies in the impossibility of modifying the developer, except within very narrow bounds, to meet errors in exposure, as the only power the operator possesses is in the direction of varying the proportions of pyro and alkali, whereas with the more rational 'ten per cent. solutions' the mixture can be strengthened, diluted, and varied in any desired degree with the greatest accuracy. Again, when the bromide is in combination with either the pyro or the alkali, the operator has certainly not full control of his developer say, for instance, if he wishes to add more alkali in a case of under-exposure. In adding the alkali, he must perforce also add a certain quantity of bromide which may be sufficient to counteract any benefit otherwise accruing from the addition of alkali. Can you not, sir, once more exert your influence in the direction of having ten per cent. solutions recognised as the standard developing solutions by all the makers of plates?"—In reply, we can only say that it was, we believe, in these columns that "ten per cent. solutions" were first recommended some years ago, but that was at a period when pyro-ammonia was almost solely used. Now, with numerous other reducing agents and other alkalies, it would not be so easy to apply universally the same system; but we do think that some nearer approach could be made to uniformity in the expression of formulæ if makers would only "put their heads together."

Our Editorial Table.

LAST week, when noticing *The Grammar of Photo-engraving*, we omitted to say that the author is Mr. H. D. Farquhar, and that the publishers are Messrs. Dawbarn & Ward, Farringdon-avenue, E.C.

News and Notes.

PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Auderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, February 5. There will be an exhibition of American and foreign photographs, arranged by Mr. Walter D. Welford. Visitors are always welcomed by the members.

REMARKABLE CHANGE IN THE STRUCTURE OF GLASS BY HEATING.—Among the thin-sided tubes of soda-glass produced for chemical purposes, there are occasionally some which, on heating, undergo a strange modification of structure. At the temperature of boiling water the upper layer displays, both within and without, a vast number of fine cracks running in all directions. These cracks do not penetrate deeply into the glass, so, that when the scales are rubbed off, the body of the tube has not lost much in thickness.—E. PRIWOZNIK in *Zeitschrift für Anorganische Chemie.*

DURHAM CITY CAMERA CLUB.—The following gentlemen have kindly consented to act as Judges at the above Club's Exhibition: Mr. J. P. Gibson, Hexham; Mr. W. Parry, photographer, South Shields; and Mr. Frank Thompson, Head Master, School of Art, Durham. The Hon. Secretary desires us to state that all exhibits will be repacked and dispatched the day following the close of the Exhibition.

PROFESSOR PAUL CZERMARK, of Graz, has succeeded in photographing a living skull without its fleshly integument by means of Professor Röntgen's X rays. An editor of the *Grazer Tagblat*, eager to observe the process, offered to have his skull "taken;" but, when he saw the result, he absolutely refused to have the picture reproduced, or even shown to any one, except men of science. He is reported not to have slept a wink since he saw his own "death's head."

THE PRODUCTION OF STEREOSCOPIC EFFECTS.—Mr. W. Mathews writes: Please note that your printer has fallen into the error of stating the year "1895"—(last year)—as the date of that communication of mine to your JOURNAL which dealt with the "Initial Stage" of "Composite Portraiture." It should have been, of course, 1885, which is over ten years ago. My earlier exemplars preceded the "Galton Composites" by more than two years. One of them, framed, still records itself as having been produced in the year "1878."

COMBUSTION OF ACETYLENE.—Mixtures of acetylene with air containing a proportion of the gas below 7·74 per cent. burn, yielding carbonic acid and water, with a yellowish flame feebly luminous. For proportions of acetylene between 7·74 and 17·37 per cent, the flame is of a pale blue, with a slight yellowish halo. The products of the combustion are carbon dioxide, carbon monoxide, watery vapour, and hydrogen. If acetylene is burnt with an equal volume of oxygen, it gives a temperature of 4000°; consequently superior by 1000° to the mixture of oxygen and hydrogen. The products of combustion consist exclusively of carbon monoxide and hydrogen, both reductive gases. This double property will render the use of acetylene in laboratories very valuable.—H. LE CHATELIER in *Comptes Rendus.*

THE LATE H. J. NEWTON.—*Apropos* of this well-known New York amateur photographer, who died recently, the *Scientific American* writes: "He began the practice of photography soon after the introduction of the Daguerreotype, and by research and experiments was able to suggest and introduce several useful improvements in photographic manipulation. Having acquired the art of drawing and painting, and noticing the usefulness and adaptability of photography for obtaining details which it would be difficult to remember, he became infatuated with the new discovery and devoted himself earnestly to its improvement and perfection. He had his laboratory and skylight arranged on the top floor of his residence, where he pursued his experiments. He recommended the use of nitrate of ammonia in the silver bath for the sensitising of albumen paper, by which the need of preliminary fuming with ammonia is avoided. About 1876-7 he improved the collodio-bromide emulsion process, and prepared an emulsion by which dry plates as sensitive as those by the wet-plate process could be made and used at any convenient time. He further suggested the use of the fixed alkalies such as carbonate of soda in developers in place of ammonia, and later, with the introduction of the gelatine dry-plate process, advised the use of yellow prussiate of potash in the pyro developer, which gave the latter greater vigour and produced more brilliant negatives. He also recommended the single solution iodide of mercury intensification method for gelatine plates. Since the introduction of the coal-tar developers he suggested certain modifications in their use for the development of prints on bromide paper, advising particularly the addition of, to a metol and hydroquinone developer, barium hydrate as yielding velvety black prints. He was identified with several photographic societies, and had been President of the photographic section of the American Institution for many years; also, at one time, he was Vice-President of the Society of Amateur Photographers, of New York."

PROFESSOR HERKOMER'S "NEW ART."—On Tuesday, at the Fine Art Society's Rooms, in describing his invention, Professor Herkomer stated that on the polished surface of a copper plate, coated with silver, the artist painted his picture with a thick black pigment resembling printer's ink. In the production of this painting he used brushes, leathers, bits of wood, his finger-tip—in fact, anything that would enable him to get the desired effect. So far, it was a positive process, requiring therefore no reversion of the subject on the plate—an inestimable boon to the artist. An examination of the painted plate showed that the ink was on the surface in different degrees of thickness, and in this variety of depth in the ink lay the first vital point of the invention. The artist, however, need in no way think of this necessary condition; it came without conscious effort in the making of his tones and gradations. This painted surface, with the ink still wet or soft, was then dusted over with a particular granulated powder, until neither the black paint nor the brighter parts of the plate were visible. A knock on the back of the plate, and the subsequent use of a soft camel's-hair brush removed the superfluous powder. As the powder contained both coarse and fine particles, it stuck to the various parts in a most discriminative way, the coarser grain adhering to the parts where the ink happened to be thick, and the finer where the ink was less, such as in the grey or light tones. Thus there was now secured a painted picture, dusted with a powder which granulated the painted touches in perfect proportion to their depth of tone, without, however, in any way altering their autographic character, but it caused the paint to cover new technical ground, and was the first stepping stone towards the conversion of the painted surface into a printing surface. In the third stage there was taken of this granulated surface a "metallic mould," or, in other words, an electrotype. Such was the conductibility of this surface that (all things being right) in ten minutes a blush of copper would spread over the whole surface when subjected to the electric bath. This settled in the most minute crevices and interstices. The plate was left in the bath until the copper deposit was as thick as an ordinary printing plate. By filing the edges the deposited plate was separated from the original painted plate, and in the former was obtained an exact negative or mould of the painted and powdered surface from which, by the ordinary methods of copper-plate printing, a perfect reproduction of the original painting was obtained.

DEATH OF MR. JOHN ADAMSON, JUN.—We regret to have to record the death of Mr. John Adamson, jun., Rothesay photographer, which took place recently after a severe illness of several months, at his residence, Firwood, at the comparatively early age of 45. Mr. Adamson for several years past has been the sole partner in the firm of John Adamson & Son, photographers, his father, its founder, having retired after having been in business for about forty years.

Mr. Adamson, sen., previous to coming to Rothesay, had a studio in Glasgow, and was considered one of the best photographers by the older methods of the art. Mr. Adamson, jun., had the full advantage of being trained under his father from his earliest youth, besides obtaining experience in Glasgow, where, for a number of years, he conducted a Glasgow branch of the Rothesay business. For several years past the deceased devoted much of his attention to marine photography, and particularly to taking views of ships and yachts under sail, in which branch of the business he was almost unrivalled. His views of the fastest steamships and yachts taken at full speed were exhibited in all the great shipping ports of the kingdom and elicited the warmest admiration.

SOLIDIFIED GELATINE.—Gelatine possesses the curious property of becoming insoluble in contact with formic aldehyde, and, at the same time, of preserving perfect transparency. Gelatine rendered insoluble, or "petrified," to use a more appropriate term, resists water, acids, and alkalies. It resembles celluloid, but has the great advantage over the latter of not being inflammable. We have here, then, a new product very easy to obtain, possessing interesting properties, and destined to play an important *rôle* in the industries. The gelatine used is the ordinary article found in commerce. The formic aldehyde is what is commonly called "formol," "formaline," and "tannaline." The commercial product is a forty per cent. solution of formic aldehyde in water. It is a colourless, sirupy liquid of a pungent odour. The vapour is not inflammable, and it is a powerful antiseptic. In order to obtain moulds of statuettes, &c, we take, for example, two pounds of good white gelatine, and steep it in a quart of water for a night. The next day the whole is melted over a water bath. For delicate mouldings, the solution is diluted with a little water. The mould, which may be made of plaster, clay, or metal, having been prepared, the formic aldehyde is poured into the melted and slightly cooled gelatine. The whole is well stirred with a wooden spatula in order to obtain a homogeneous mixture. The latter is then poured into the mould and allowed to cool. After the object is taken from the mould it is finished by immersing it for a few instants in a concentrated solution of formic aldehyde, or, if it is too large for immersion in the solution, its surface is painted therewith. Unfortunately, objects obtained with the gelatine alone are transparent and resemble glass. By previously adding to the gelatine some finely sifted zinc white mixed with a little water and alcohol, and in operating in the same way, beautiful imitations of white marble may be obtained. By mixing the oxide of zinc with appropriate colours, objects of all shades may be obtained, and, by properly arranging the colours, veins, striæ, spots, &c., may likewise be produced. The solidified gelatine may be used for imitating mother-of-pearl, tortoiseshell, amber, coral, &c., and for the manufacture of toys and artificial flowers.

Patent News.

THE following applications for Patents were made between January 13 and 25, 1896:—

PANORAMIC CAMERAS.—No. 869. "Improvements in Photographic Cameras for taking Panoramic Views." L. JEFFERY.

HALATION PREVENTIVES.—No. 871. "Certain new and useful Improvements in Preventing Halation in Photographic Dry Plates." W. HAYDON.

PHOTOGRAPH-HOLDERS.—No. 905. "Improvements in Appliances for Holding Cards, Photographs, and the like, during Sale or Exhibition." L. MYERS.

PRINT-WASHER.—No. 913. "A New or Improved device for Washing Photographic Prints." W. KERR.

ARTIFICIAL LIGHT.—No. 972. "Improvements in Artificial Light Apparatus applicable for Photographic Purposes." J. PARKINSON.

EXHIBITING TRANSPARENCIES.—No. 1088. "Automatic Clockwork Motor for Exhibiting Photographs, Transparencies, or Advertisements, either by Daylight or Artificial Light." T. ILLINGWORTH.

LANTERNS.—No. 1142. "An Improvement in Optical Lanterns." B. ACRES.

TRIPODS.—No. 1307. "Improvements in Mounting photographic Cameras on their Tripods or Supports." J. H. FAY.

PRINT WASHER.—No. 1339. "An Improved Washing Apparatus for Photographic Prints." W. M. SIMPSON.

CHANGING BOX.—No. 1381. "Improvements in or relating to Change Boxes for Photographic Cameras." F. S. LITCHFIELD.

BURNISHER.—No. 1391. "Improvements in Machines for Calendering or Burnishing Photographic Prints." W. PRATT.

CHANGING BOX.—No. 1423. "Apparatus for Changing Sensitive Photographic Plates and Films (without consequent exposure to light) before and after Exposure in the Camera." J. BIDGOOD.

PHOTOGRAPH-HOLDERS.—No. 1481. "Improvements in or connected with Stands, Holders, Clips, or Devices for holding or supporting Photographs, Pictures, and other Documents." T. GAZE.

GELATINISED PAPER.—No. 1556. "Improvements in the Manufacture of Gelatinised Paper or other Fabric suitable for the Reproduction by Printing with Fatty Inks of Writings, Drawings, and the like." C. RAYMOND.

SPOOLS.—No. 1573. "An Improved Roll or Spool upon which Flexible Photographic Films are wound." J. B. B. WELLINGTON.

PHOTOGRAPH FRAMES.—No. 1650. "Improvements in Strut-backs for Picture and other Frames." L. A. MARION, H. GUIBOUT, G. BISHOP, F. BISHOP, and J. P. KIRK.

ELECTRIC LAMP.—No. 1793. "The Inglis Electrical Photographic Lamp for Studio Purposes." J. M. INGLIS.

PRINT-WASHER.—No. 1822. "Improvements in or relating to Photographic or other Prints." T. J. FOSTER.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
3	Camera Club	Smoking Concert.
3	Richmond	*Our Tour in Norway.* F. A. Bridge and A. Bridgman.
3	South London	*The Chemistry of Every-day Photography.* W. H. Dawson.
3	Walthamstow	*Paris.* A. P. Wire.
4	Birmingham Photo. Society	Exhibition of Photographs of the Transvaal and South Africa. Sir J. Benjamin Stone, M.P.
4	Brixton and Clapham	Lantern Evening.
4	Gospel Oak	*Hints on Enlarging.* J. Bishop.
4	Hackney	*Amateur Photography in America.* Mrs. Snowden Ward.
4	Putney	*Uranium Toning and Uranium Intensification as applied to Picture-making and Photo Plastics.* Albert Hill.
5	Borough Polytechnic	*Gleanings Here and There.* E. Dockree.
5	Croydon Camera Club	Special Council Meeting.
5	Photographic Club	Exhibition of American and Foreign Photographs.
5	Southport	R. W. Thomas & Co.'s Slides Illustrative of the Special Properties of their Anti-halation Plates.
6	Bradford	Lecture and Demonstration. N. Lubochez.
6	Camera Club	*Lincoln Cathedral.* Mr. Evans.
6	Ealing	Lantern Evening.
6	Liverpool Amateur	Lantern in Use.
7	Birkenhead Photo. Asso.	*Wensleydale.* The Secretary.
7	Croydon Microscopical	Conversational Meeting.
7	Moseley and District	*Some Points in Connexion with Picture-making.* Hubert Coop.
7	West London	Annual Dinner.

ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 28,—Technical Meeting,—Mr. E. Cecil Hertslet in the chair.

Scrutineers were elected for the forthcoming election of Council, &c.

PROFESSOR RÖNTGEN'S DISCOVERY.

Mr. J. W. GIFFORD sent specimens of his latest results in photographing with the invisible rays from a Crookes tube, including a representation of the skeleton of a human foot, taken by means of a spherical radiant tube, an Apps intensity coil, and a hand dynamo, the time of exposure being half an hour. This photograph showed an osseous protuberance of the metatarsus, occasioning distortion of the great toe. There were also exhibited prints from negatives by Mr. Gifford, one being a pinhole picture of the tube itself, and another showing some metal discs, which had been shielded by a cardboard box and a thick porcelain dish, there being strong evidence that sparking, or something similar, had taken place between two of the discs.

Mr. T. E. FRESHWATER showed lantern slides from Mr. Swinton's negatives. One represented a razor photographed while in a cardboard razor case, and showing only the blade and metal cap at the end of the handle; others showed the contents of a leather purse, taken through a sheet of aluminium of considerable thickness; a corkscrew, and other metallic objects, which had been enclosed in a calico pocket; an ordinary blacklead pencil, showing the cap protecting the point, and also the strip of blacklead, but not the wooden casing; and the skeleton of a frog. [These slides were referred to in our last issue, page 59.]

Mr. CROFTON asked whether any attempt had been made to ascertain whether these rays could be refracted, and suggested that, by means of a lens of ebonite, real photographs might be obtained instead of shadowgraphs.

Mr. W. E. DEBENHAM suggested the use of a mirror, as in the early Daguerreotype days.

Mr. T. BOLAS, referring to the spark mentioned by the Assistant Secretary in connexion with one of Mr. Gifford's photographs, thought it could hardly have been a spark in the usual acceptation of the term, but rather some kind of Hertzian discharge.

The ASSISTANT SECRETARY was inclined to think it was an actual discharge.

Mr. BOLAS said the point was of special interest, because, if the radiations from a Cookes tube would cause a sparking between two metal objects, that was one fact which brought them nearer the category of Hertzian oscillations and ordinary light.

Mr. E. J. WALL said Professor Röntgen had tried lenses of pitch and ebonite, and found it impossible to refract the rays.

Mr. BOLAS remarked that at the last meeting of the Society Mr. Gifford had showed results which clearly indicated that the rays were refrangible by ebonite.

The ASSISTANT SECRETARY differed from Mr. Wall, and said Professor Röntgen had quoted experiments showing that the rays could be refracted.

Mr. J. H. AGAR BAUGH read a paper describing

DR. RUDOLPH'S METHOD OF LENS-TESTING,

and showed some of Dr. Rudolph's results of tests of Zeiss anastigmats and

other lenses. The operations described had special reference to means of ascertaining the quality of definition from the middle to the edge of the field, the distribution of depth of focus on the ground glass, and the angle of the sharp image with different diaphragms, and the only method which Dr. Rudolph thought satisfactory for showing these properties was to photograph a suitable test object. The test object used consisted of a series of rods or vanes mounted spirally one behind the other, and to which printed cards were affixed, the exact construction being shown by Mr. Baugh by means of lantern slides. Dr. Rudolph had pointed out that his method possessed a very important property, in that the results showed in themselves whether all the adjustments precedent to the test had been accurately made.

Mr. DEBENHAM said that spirally mounted objects, used singly, were a very old device for testing lenses, but the employment of a number of such objects, covering nearly the whole of the field, as in Dr. Rudolph's method, was very convenient and useful, and enabled one to draw out a chart of the character of the lens for flatness of field, definition, &c.

The HON. SECRETARY believed the chief advantage of the process was that by it the depth of definition all over the field could be measured, and, at the same time, an exact estimation of the curvature of field could be made, which was not possible with a flat test object.

A vote of thanks having been passed to Mr. Baugh,

Mr. FRED ILES exhibited a series of slides which, he said, were the first results of various attempts he had made in producing

STEREO-MICROGRAPHS

with colour-tone effects. It might be said, he admitted, that he was endeavouring to add a meretricious character to a subject which should be dealt with in a purely scientific and analytical manner, but his object had been to render photographic images of miscroscopic objects in such a form that they should be attractive, interesting, and instructive to a non-scientific audience, and to popularise a somewhat neglected branch of photography. He had endeavoured to produce, as nearly as possible, a solid or steroscopic image of medical and botanical sections, diatoms, insect parts, and other microscopic objects, and to render them as nearly as possible in their natural colours, or in contrasting colours to the background, so as to show to the best advantage. By means of a special method of illumination he had succeeded in producing slides which gave the appearance of solidity and rotundity to the specimens photographed, fat cells from the omentum of a cat, for instance, showing as solid globules, and the enveloping tissue being readily distinguished from the cells themselves; a number of slides were also exhibited, in which those produced by the modified treatment showed great superiority to the ordinary photo-micrographs. Mr. Iles then passed through the lantern a series of stereo-micrographs, the colour of which had been changed by chemically toning the image, the background not being affected, and much admiration was expressed by the audience for the beautiful results which had been obtained.

A brief discussion followed, in the course of which two or three members sought to elicit from Mr. Iles some details of his methods, both of photographing the objects and of toning the slides, but he declined to be "drawn," stating that his apparatus had been patented, and would eventually be placed on the market. The proceedings concluded with a hearty vote of thanks to Mr. Iles.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 23,—Mr. J. S. Teape in the chair.

RÖNTGEN'S DISCOVERY.

Mr. E. J. WALL said that a full translation of Röntgen's original paper would appear this week in one of the English papers. Although it has been assumed that these rays are cathodic rays, Prof. Röntgen says that they are not, and prefers to style them × rays. Referring to statements connecting them with the Hertzian rays, Mr. Wall said they were totally different, as they cannot be refracted, at least at present.

Mr. T. E. FRESHWATER, after quoting some remarks made by Mr. Bolas, said, when this was first mooted, Mr. Campbell Swinton set to work in the same direction, and succeeded in obtaining photographs of various subjects by these means. Through the kindness of Mr. Swinton he had been able to bring up some of his results, and passed round four or five lantern slides and prints. The subjects included one of his own hand, in which a most decided image of the bones was visible, and had been obtained by an exposure of four minutes, with a thickness of black vulcanised fibre between the plate and the hand. Another was that of a living frog, displaying the whole of the bone system, while pictures of coins enclosed in a purse, and a razor in its case, were clearly defined.

Mr. A. MACKIE detailed some of the experiments made by Mr. Gifford, of Chard, and described at the Royal Photographic Society, showing very similar results.

Mr. SNOWDEN WARD, referring to one of these where six brass stops were put in contact with the plate and subjected to the influence or radiations, said two of them showed no sign whatever, but the other four exhibited a sort of half-tone of a circular shape corresponding to the size of the aperture in each, and from them radiated on each side a long halo, one being absolutely at right angles to the other three, which were all in the same direction. These were done without the Crookes tube, Mr. Gifford joining the poles of an induction coil to sheets of copper, and placing the plate between the two. The results were the subject of much comment, it being suggested that something analogous to polarisation had occurred.

Mr. MACKIE mentioned one where an ebonite dish was one of the obstructing articles, the plate showing two long lines exactly corresponding to the ribs of the dish.

STRIPPING FILMS.

Mr. WALL, speaking on this subject, said a method, recommended recently by one of the German papers, was that of treating the film with formalin, which renders gelatine absolutely insoluble, and the film would not stretch.

The HON. SECRETARY proceeded to strip two negatives, as promised, using a solution of the following composition:—

Old methylated spirit	8 ounces,
Hydrochloric acid	½ ounce,
Water	2 ounces,

and mentioned that, with this, he was generally able to strip a plate in a very few minutes.

ANTI-HALATION PLATES.

A question from the box read as follows: "Can any one tell the nature of the colouring matter used in the substratum in Thomas's anti-halation plates?"

Mr. WALL had not examined critically, but believed it to be permanganate of potash, which, in contact with gelatine, is reduced.

PHOTOGRAPHIC CLUB.

JANUARY 22,—About eighty members and friends being present, Mr. H. P. Smith in the chair.

Mr. HEARSON presented a digested and tabulated result of the first

LIMELIGHT-JET COMPETITION,

the main facts of which were, first, that the difference between the strongest and the weakest light was as 100 to twenty-six, and, secondly, that the amount of light obtained was not always in proportion to the amount of gas consumed; in other words, that there were great inequalities in efficiency. Mr. Hearson said that, there having been no measurements of the nozzle apertures, it became difficult to draw anything like a final conclusion. Proceeding to the further series of tests, which he had in hand for the evening, he said that he proposed to adopt a different method of comparing the lights on that evening. Having alluded to the law of inverse squares, and illustrated the way in which the actinic value of a light decreased with the square of the distance between it and an illuminated surface (which point he neatly illustrated with a diagram upon the screen), he proceeded, with the aid of a further diagram, to explain to the meeting the Bunsen method of comparing the shadows thrown by an opaque object upon a screen. He proposed, he said, that evening to adopt a method of comparing the results by which the whole of his audience would be enabled to see the tests, and to declare their own verdict. For this purpose he had prepared two lantern-slide diagrams, which consisted of a scale marked off into inches and tenths drawn on clear glass; he should place one of these (identical) scales in each lantern, and also one of the competing jets. He would then move one or other lantern forward or backward from the screen, until the two scales appeared to be equally brightly illuminated; the comparative lengths of equal portions of the scales would then represent the comparative values of the lights; thus, supposing that the scales upon the screen appeared equally illuminated (the test was, of course, a visual one), if one inch on one scale was represented by one and a half inch on the other scale, the comparative values of the lights would be as one to one and a half. Mr. Hearson added that this method eliminated the necessity for using lanterns with paired lenses. As a result of the series of tests which were then carried out, jet No. 4 and jet No. 1 were declared to be of equal light-giving power, the average value of the lights thrown by other jets being from ·6 to ·75 of the best. The nozzle measurement of No. 4 jet was $\frac{85}{1000}$ of an inch, and of No. 1 jet $\frac{72}{1000}$. Mr. Gwyer, of Bristol, manipulated the former, and Mr. Scarborough the latter.

An interesting feature of the competition was that an injector jet drawing house gas showed a very high efficiency, possibly only limited by the fact that the manipulators were short of a high-pressure tap and connexions. An ether separator of an ordinary commercial pattern, which was informally tried after the meeting was over, was thought to be equal to the best mixed jet shown during the evening.

Formal votes of thanks to Mr. Hearson and the gentlemen who had brought jets for competition were passed by acclamation.

Croydon Microscopical and Natural History Club (Photographic Section).—January 24.—A paper on

VENUS PAPER AND THE VENUS TONING AND FIXING BATHS

was read before this Section by Mr. C. H. BURNABY SPARROW, Mr. A. S. Wild in the chair. Mr. Sparrow said that the paper he was bringing to the notice of the members was called Venus because of the very beautiful result obtainable with it, and that it was prepared by an entirely new process, which rendered it the most permanent of any silver papers, so much so, that nothing short of the destruction of the paper itself would cause destruction of the image. The action of even the strongest light appears to have no effect upon the image. He said: "If you examine the prints I have brought with me, you will see that the image is so well on the surface, even with the roughest papers, that every detail stands out quite as well as it does on any gelatine or albumen papers, and, with the smoothest paper, the minutest detail is better rendered than on either of the papers I have mentioned. For prints from negatives of machinery it is considered very suitable, rendering every detail fully, as you will see from the print I show you of the machinery of an electric current generating station. For toning, any good bath may be used; but, as for all plain-surface papers, such bath should be weak. It is very suitable for platinum toning, and a good bath is as follows: Potassium chloro-platinite (15 grains to 15 drachms of water), 30 minims; nitric acid, from 6 to 10 drops; distilled water, to 12 ounces. For this bath printing should be deep, the shadows may even be bronzed, and the time taken is about twenty minutes for a black tone, but in twelve to fifteen minutes a lovely brown can be obtained. But the easiest, and certainly the most rapid, toning process is by means of the Venus combined baths, which are quite new, and, if properly used, give results that may be relied on as absolutely permanent. I may here mention that these baths give excellent colours with gelatine and freshly prepared albumen papers, though, with this last paper, its action is rather slow. For rich warm brown tones, the prints, just a little over-printed, are placed, without previous washing, in the No. 2 bath for three minutes, then in

an extra fixing bath composed as follows: Sodium hyposulphite, 1 ounce; borax (crystal or powder), ¼ ounce; distilled water, to 20 ounces; where they are allowed to remain for about five minutes. This extra fixing bath is necessary, partly because of the richness of the paper in silver, and partly because of the short time they are in the combined bath; and it will be noticed that no change of colour whatever takes place in this extra bath, due to the presence of the borax. For black tones, it is necessary to print very much deeper, and in this case the prints must be thoroughly washed and placed in the No. 1 solution till they are of a deep plum colour, then drained and immersed in No. 2 solution till a silver grey or fine black is attained, the depth of colour being determined by the depth to which the printing has been carried. In this process no extra fixing bath is required. Whichever of these methods is adopted, a two hours' thorough washing in running water is necessary after the final fixing as on this greatly depends the permanency of the resulting prints; and it must be borne in mind that the prints are much darker when dry, so that they appear when wet, owing to the transparency of the paper when it is wet, consequently it is advisable, especially when aiming at the warm tones, not to carry the toning processes too far." Some of the members brought prints, which were most successfully toned by each of the three above-mentioned processes, and, at the conclusion, a hearty vote of thanks was carried to Mr. Sparrow for his most interesting demonstration.

North Middlesex Photographic Society.—January 20.—The election of officers for the year took place, resulting as follows:—*President:* Mr. J. C. S. Mummery.—*Vice-Presidents:* Messrs. W. B. Goodwin and E. R. Mattocks.—*Council:* Messrs. J. Addison, R. Child Bayley, F. W. Cox, A. J. Golding, A. J. Johnson, A. H. Lisett, J. W. Marchant, J. MacIntosh, F. L. Pither, C. R. Steele, H. Stuart, and C. O. Gregory.—*Treasurer:* Mr. H. Smith.—*Secretary:* Mr. W. Taylor, 38, Palace-road, Hornsey, N.—*Assistant Secretary and Curator:* Mr. W. J. Simpson.

Richmond Camera Club.—January 13, Mr. Eonis in the chair.—Mr. R. Child Bayley, R.P.S., gave a lecture and demonstration, entitled

The Speed of a Plate.

This is a matter of which every photographer should have some knowledge, but, owing perhaps to the deeply scientific covering in which a subject of this kind is usually wrapped, the average amateur leaves it severely alone. Mr. Bayley, however, by the aid of simple language and practical examples, was enabled to make the various details perfectly apparent and very interesting to all. The Warnerke sensitometer, introduced about 1879, was mentioned as the first serious attempt to obtain plate speeds, but it had many defects, to which attention was drawn. Spurge's actinometer, which followed the above, was considered by Mr. Bayley to have a great future before it, although it had so far been very much neglected. The Hurter & Driffield system was then fully gone into, Mr. Bayley showing and explaining the complete apparatus for obtaining the speed number, and, on the conclusion of his remarks, he made an exposure by each of the above-mentioned methods, which, on development, were handed round for comparison.

January 20.—Mr. C. W. Harris gave an interesting address on the subject of

Shutters.

After calling attention to the essential qualifications of a good shutter, he described and showed specimens of a great variety of those now on the market, including Thornton-Pickards, Bausch, and Lomb, Newman & Guardia, and many others. Several other members showed specimens, and gave their experiences, and a useful and practical evening was passed.

Woodford Photographic Society.—January 16, Mr. E. B. Marriage in the chair.—A quantity of literature, supplied by Messrs. Elliott & Co. and Messrs. Thomas & Co., was distributed among the members present. The Chairman passed round a number of slides that had been intensified by various methods. These were afterwards passed through the lantern, and the results compared, but some doubts were expressed as to their permanency. The slides contributed by the Leeds Photographic Society for circulation among the societies affiliated to the Royal Photographic Society were then shown, as well as some by Mr. Malby.

Woolwich Photographic Society.—January 23, Colonel C. D. Davies presiding. Mr. G. H. Moss, of the South London Society, gave a paper on

Collodio-chloride and Plain Salted Papers.

the formula he used being as follows:—A.—Zinc chloride, 12 grains; tartaric acid, 5 grains; citric acid, 5 grains. Dissolve in 1½ ounces methylated sulphuric ether. B.—Silver nitrate, 60 grains. Dissolve in distilled water, 20 minims, by heat; then add 100 minims of pure glycerine, and 4 ounces of methylated alcohol. Add to this 60 grains of gun-cotton, well shake, and add 1½ ounces of ether. This forms a greyish white emulsion of silver in collodion. Add A solution to B in dark room, or by gas or lamplight, a few drops at a time, shaking the bottle well after each addition; after a final shake from five to ten minutes, allow to settle for twelve hours; then filter through cotton-wool, or decant into another bottle; it is then ready for use. The best paper for coating is baryta paper, and the best method of coating it is to lay it in a frame, a sort of wooden dish with its bottom hinged on; the paper will dry in about two hours. Collodion paper prints much quicker than ordinary silver papers; it can be toned in ordinary baths, but his favourite formula is: Acetate of soda, 40 grains; water, 8 ounces; gold chloride, 2 grains; and 3 or 4 drops of saturated solution of chloride of lime. Fixing: Hypo, 1 ounce; water, 12 ounces; fix from ten to fifteen minutes; then wash well for one hour. This paper tones better with platinum than does gelatine paper. It tones very evenly any colour from red to black in one bath. If in a hurry, hot water can be used for washing. Any chloride can be used instead of zinc chloride, but the latter has the advantage of being soluble in ether or alcohol, whereas most others require water, and too much water in emulsion tends to crapiness. The glycerine is added to keep the paper from curling. The emulsion keeps well." Mr. Moss showed some in good condition made in February 1893, and also some prints recently made with the same. This process is as permanent as any of the silver processes, some prints being shown in perfect condition which had been made five years ago. Lantern slides can be coated with this emulsion, but a substratum is required, such as the following:—Egg albumen, 2 drachms; acetic acid, 1 drop; water, ½ drachm. Stir up, and filter after settling down about two hours; add 2 drops of ammonia '880. High temperature gun-cotton should be used, such as supplied by Rouch & Co. Do not use the emulsion near gas or other flame. After a short discussion, Mr. Moss gave

The Preparation of Rough and Plain Salted Papers.

His formula for salting is:—Sodium chloride, 150 grains; ammonium chloride, 100 grains; potassium bichromate, 4 grains. Soak Whatman's or Rives paper in above bath from three to five minutes. After drying, sensitise in: Silver nitrate, 1 ounce; citric acid, 150 grains; water, 8½ ounces. Float on this for two minutes, avoiding air bubbles. The paper will then be a light primrose colour; if it does not possess this colour, the resulting print will probably lack vigour. If printing from a weak negative, use more bichromate; if from a hard one, use less. Do not allow the sensitising bath to drop below 50 grains for rough, and 40 grains for smooth papers per ounce. When the paper is dry after sensitising, print but little deeper than required for finished print, tone in any bath, rinse in several changes, and fix in hypo, 1 ounce; water, 10 ounces; ten minutes for Rives, and twenty to thirty for others, according to thickness. It tones easily any colour to warm black, and gives good tones for some purposes by merely fixing without toning, after washing for about ten minutes. Mr. Moss passed round several excellent prints by both processes, which were much admired.

Bradford Photographic Society.—January 23, the President (Mr. Alex. Keighley) in the chair.—Mr. Percy Lund gave an illustrated limelight lecture dealing with

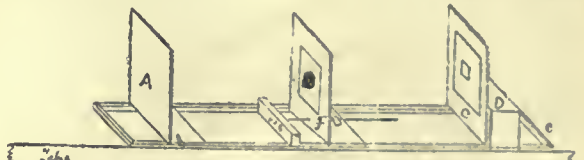
The Utility of Photography.

The lecturer dwelt forcibly on the uses of photography in the arts, sciences, and trades. To the artist, he said, it proved of immense value as a speedy and efficacious method of making rough studies that would aid him in future studio work. To the geologist it truthfully portrayed the different strata, &c., and for the antiquarian it could faithfully record the hundred-and-one historical fragments that would, in the hurry and scurry of life, be otherwise passed by unnoticed. To the astronomer it had proved of inestimable value, rendering truthfully as it does the exact position and features of the heavenly bodies. The business man could use it in many different ways, while to those on pleasure bent it served to bring back souvenirs of places visited. Meteorological and stereoscopic photography were also freely dealt with. Mr. Lund aptly illustrated his lecture with many beautiful photographs, covering a wide range of subjects, the most remarkable being examples of artistic, geological, and instantaneous work. The lecture was listened to with great interest by a large audience, after which a vote of thanks to Mr. Lund, proposed by Mr. O. Nicholson, and seconded by Mr. W. Harmsworth. Mr. R. J. Appleton acted as lanternist.

Derby Photographic Society.—January 21, Mr. G. Walker occupied the chair.—Mr. Willatt was elected a member. Mr. W. Glen gave a demonstration of

Enlarging.

He showed an apparatus capable of enlarging from quarter-plate to about 20×16, and which was also adaptable for reducing to lantern-slide dimensions from the last-named size by merely turning a winch screw. While not differing in the main from the usual form, it possessed several minor improvements, viz., to facilitate ease of adjustment, and could be worked by day or artificial light, in the latter case a condenser being dispensed with. Amidol was recommended for developing, which, when properly restrained with bromide, and a second addition of sulphite of soda, allowed considerable latitude in exposure. Of course, if a large number of copies were required, it was considered advisable to make an enlarged negative and print in platinotype. Herewith is a rough sketch of enlarging apparatus, together with a description of same. A is the support for focussing screen and carrier for



sensitive plate or paper, being an ordinary oak frame with glass front and removable back, thus doing away with pins, &c., to hold the paper flat. The lens board, F, has the usual rising and side movement; the block, B, fits in a slot, and is firmly held in position by bolts, and may quickly be removed and fixed on the other side of lens board or at E, and the space between A and F filled by a bellows, for which grooves are provided. A is moved by hand, being clamp-screwed when in position. It may be removed and replaced by a travelling platform, carrying a small camera for making lantern reductions. D is board for carrying enclosed lamp, C, of course, being negative carrier. All the travelling parts are readily unshipped and packed flat on the base-board for removal. The annual report and balance-sheet were submitted, showing the Society in a flourishing condition, there being seventy-four members on the books and a balance at bank of 1*l.* 14*s* 11*d*. Votes of thanks were passed to the publishers of the photographic journals for their kindness in sending copies of their journals to the Society.

Gainsborough and District Camera Club.—January 17.—Mr. Nahun Luboshez lectured on

Successful Portraiture and Platino-bromide Papers.

Mr. Luboshez began by displaying splendid specimens of platino-bromide enlargements and contact prints. These had been developed with ferrous oxalate, a developer which has much to recommend it, being of established

quality and character, and preferable to alkali developers, as it is not liable to stain the print. It also permits of latitude in the tone of the finished print, hard or soft tones being produced according to the quantity of ferrous sulphate in the developer. This may vary from one in four to one in ten of potassium oxalate. Exposure for bromide prints should be long, that is, the circumstances should be arranged to require a long exposure, so that the percentage of error, in either under or over-exposure may be as small as possible. Use old developer to mix with the new, instead of bromide as a restrainer, and control the development so that the subject may be properly treated to produce exactly the result that is desired. Mr. Luboshez dispensed with a practical demonstration of development, as being a waste of time, and by no means so instructive as personal experiment in the dark room. He, however, showed a toning process for giving a sepia tint to the platino-bromide print. Dealing with portraiture, the lecturer showed, by graphic sketches on the blackboard, how a portrait may be distorted through improper lighting, the action of a ray of light falling on a feature being to force it in the direction of the ray. Though it is not possible to directly realise colours in photography, it is possible to convey the colour tones, by proper lighting and by true gradations in blacks and whites. Most portraits show distortions, but these are removed to some extent by retouching.

Moseley and District Photographic Society.—The inaugural meeting was held in Arnold School, Alcester-road, the premises of the above Society, on Friday, January 24. Dr. Hall-Edwards took the chair.—The following officers were elected:—*President:* Dr. Hall-Edwards.—*Vice-Presidents:* Captain Davidson and Dr. Radcliffe.—*Hon. Treasurer:* Mr. Charles H. Williams.—*Hon. Secretary:* Mr. Fred Coop, Glenwood, Church Road, Moseley; these, with four other gentlemen, forming the Committee. Business being done, slides by Messrs. Baker, Bateman, and Hall-Edwards were passed through the lantern. Slides calling for special attention were *A Figure Study*, by Mr. Harold Baker; *Old Mill*, by Mr. Baynton; *The Mystery of Life*, by Dr. Hall-Edwards, also some figure studies by the same gentleman. The opening meeting started by registering thirty-two gentlemen as members. This Society has decided to encourage the membership of ladies.

Oxford Camera Club—January 13.—A demonstration on enlarging had been promised by the Automatic Company. This, however, had to be postponed owing to the illness of the demonstrator, the evening being devoted to an

EXHIBITION OF LANTERN SLIDES

by various members, with a view to their criticism by those present. Some good specimens were shown, together with some inferior ones; but members were very chary of expressing any decided views as to the merits or demerits of each. This was partly due, perhaps, to the authorship of the slides being known, which introduced the personal element too strongly.

West Kent Photographic Society—January 13.—An address was given by Mr. Luboshez, now representing Messrs. Eastman & Co. The lecturer divided his subject into two parts; in the first he introduced Messrs. Eastman's platino-bromide paper, and showed some very beautiful and delicate life-size enlargements printed on the same. He explained in a brief but extremely lucid manner the methods of exposing, developing, toning, and fixing, found most suitable. The second half of Mr. Luboshez' address was devoted to successful portraiture, and many were the valuable hints he gave regarding exposure and development; but perhaps the most valuable instruction he imparted was on the proper diffusion of light in the studio, and suggestions for an adaptation of the same (to an extent) to outside work.

York Photographic Society.—January 22.—Mr. LUBOSHEZ, of the Eastman Company, added another to his already long series of successful meetings, receiving quite an ovation at the close of his lecture, reports of which have recently appeared.

Glasgow and West of Scotland Amateur Photographic Association.—January 20, Annual General Meeting.—The Council's report showed a membership of 312; funds in bank, 84*l.*; property in rooms valued at 160*l.*, and no outstanding liabilities. A collection of lantern slides made by members was exhibited. The set, numbering about 200, with descriptive lecture, will shortly be offered on loan to the photographic societies of the kingdom, and intimation will be made when they are ready. The pictures illustrate the river Clyde from source to sea, the city of Glasgow, and some of the picturesque districts within easy reach of the city.

FORTHCOMING EXHIBITIONS.

1896.	
February 27-29	Woolwich Photographic Society.
March 2-6	*South London Photographic Society. Hon. Secretary, Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.
„ 3-6	*Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

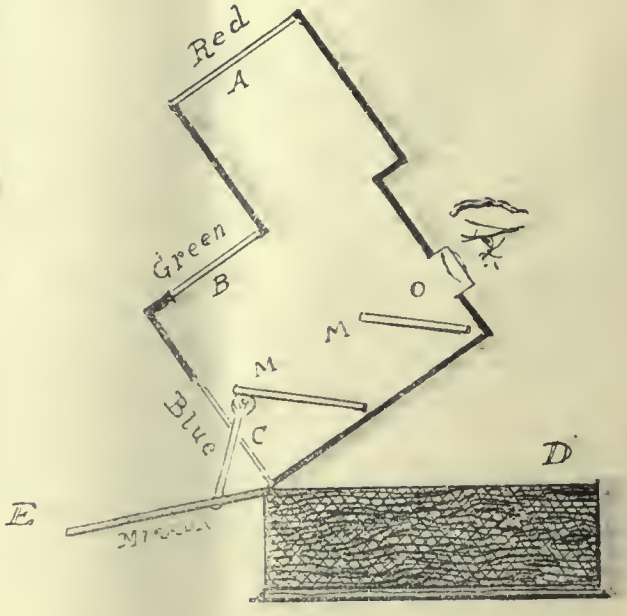
STEREO-PHOTO-CHROMOSCOPES.

To the EDITORS.

GENTLEMEN,—I have just read in the last number of your interesting ournal a report of Mr. Ives's conference at the Camera Club. I think it is desirable that a conclusion as to the value of a photo-chromoscope should not be arrived at without an opportunity of comparing one of these instruments with others. For myself, I cannot estimate the value of the instrument, shown by Mr. Ives at the Camera Club, from the too brief description of it given in your report. I must first see it.

I can only say that there may be other photo-chromoscopes quite as simple as Mr. Ives's that produce equally remarkable results. There is Mr. C. Natchet's, for instance, the interior arrangement of which is suggested throughout the diagram you have published, but it contains two platinised reflecting and transparent mirrors.

The transparency is in about the same position as in Mr. Ives's instrument.



In the above diagram the eyes are at O. M' and M¹ are the two reflecting, translucent mirrors. The pictures and coloured glasses are at A, B, and C. E is an ordinary mirror to throw light on C. M receives the picture A. M¹ receives the picture B. C is seen directly, through M and M¹. D is the stand on which the arrangement is pivoted, in order to obtain the best light possible. The instrument may be arranged for flat or stereoscopic pictures.

I do not know if the polychrome combination of Mr. Ives's coloured glasses tends to produce effects of pigmentary superposition, but I fear so. As regards Mr. Nachet's photo-chromoscope I obtain admirable and perfect effects.

Of course I cannot form an adequate idea of the results obtained with the instrument shown in London, but I cannot allow Mr. Ives's assertion to pass without question that his instrument is the only good one, theoretically and practically. It assumes too much.—I am, yours, &c.,

Paris, January 17, 1896. LEON VIDAL.

SAPIENT SUGGESTIONS.

To the EDITORS.

GENTLEMEN,—What! the dear old boy on the rampage again, and still harping on the same melancholy theme—his lost Paradise. But it was cruel of "Cosmos" to tantalise him by conjuring up a vision that can never become a reality. Honorary Fellowship! I am afraid we cannot manage it for him, much as many of us would like to see his jovial face and hear his cheery voice amongst us again. Even if we could satisfy this last new yearning of his heart, he would still be unhappy. An honorary Fellow is a Fellow without an ordinary Fellow's power to do mischief, and I am sure that would be an unsatisfactory position.

Of course, when our dear old friend writes on "Paradise lost" we do not expect dull ordinary prose from his pen. From a matter-of-fact point of view his language may seem incoherent, but that is because we are unaccustomed to the refinements of so rich and exuberant a fancy. To confound Charles II. with James I. would be an act to be condemned in an ordinary individual, but, with him, it is a feat of inaccuracy that serves the purpose of an embellishment to adorn his literary style, and it improves rather than detracts from the sense of his words. After all, What are facts? Are they not merely shackles to enchain genius? He refuses to be bound by them, and is he not right? Fancy the dear old boy having to think before he wrote or spoke whether that which he was about to say was strictly according to fact. Leave facts for ordinary mortals to deal with and let him continue to entrance us with the lofty flight of his imagination.

But in appreciating the genius of my dear old friend, "An Old Member," I must not descend to fulsome flattery. He is not an ordinary mortal, but atill he is mortal, and therefore not all-wise. It was not prudent, for instance, to refer to "hanging exhibitions," for that reminds us of an episode we (and perhaps he) would gladly forget; again, it was not wise to state an opinion that being reasonable never succeeds, for that, of course, is a matter about which he cannot speak with authority from personal experience. Here's good luck to him, and may his shadow never grow less!—I am, yours, &c., ANOTHER OLD MEMBER.

THE PHARMACEUTICAL SOCIETY.

To the EDITORS.

GENTLEMEN,—I fear your correspondent, "D.D.," in a recent issue of your Journal, injures rather than assists the cause of his Society, for the less he says the better, for the trade of this country, where the use of poisonous chemicals or drugs is required, is suffering immensely through the outrageous monopoly acquired by the druggists. When the Poisons Act was passed the sale of chemical and scientific apparatus lay, in a great measure, in the hands of a few leading druggists, who in many cases were well ahead of the mass of the people in culture and intelligence. At that time science, particularly chemistry and photography, was not taught so generally in our schools. Now, our superior education has roused up the latent intelligence and quickened the commercial impulses of our young men, and the consequence is that many have so studied and improved—indeed, in some instances, created—special departments of industry, that dealers and experts have sprung up, and who alone are qualified to deal in the material required. This is particularly the case in photography, as in brewing, distilling, electrical engineering, &c.; hence the necessity for an alteration, and that as soon as possible, in the Sale of Poisons Act. Let the dispensing and sale of medicines containing the poisons of the schedule remain still in the hands of the druggists, but allow the sale of all chemicals and drugs generally to be open and free—except, if thought necessary, the sale of the scheduled poisons be registered as now in the case of druggists. It is very questionable if such a precaution is any deterrent at all, and is, more or less, a nuisance to the public industries. The fact that any of the said poisons can be bought in large quantities from our own wholesale houses, and in any quantity from foreign ones, makes the whole matter a farce. I have also seen in large chemical and glass works, and the same can be said of many of the metal industries in such places as Birmingham, &c., the most poisonous of chemicals used without any precautions whatever, and it would be easy for any would-be poisoner to get from such places an unlimited supply.

My advice to the Pharmaceutical Society is to adapt its rules to modern requirements, asking of any intelligent man or woman to show merely that they know what they are selling—will put any of the scheduled poisons in the prescribed packages, and register the sale if thought necessary. A small fee for registering such a qualification could be insisted upon. The Poisons Act might then remain on the statute, and the Pharmaceutists maintain their monopoly for dispensing, &c. If they do not do this, then the photographic dealers should agitate at once, and I think they will find the country ripe enough now to quash the present monstrous iniquity. That a man like Mr. Hume, with his great intelligence and long experience and practice, should be stopped selling photographic chemicals is tyranny, pure and simple. My experience of a large number of the present druggists is, that they are thoroughly ignorant of the very simplest requirements of our commercial industries, and that from very few of them can be obtained any pure chemicals or drugs, such is the result of monopoly and competition.

If "D. D," quotes the small profits on patent medicines, what about a bottle of simple quinine tonic, containing, say, twenty grains of quinine, in the eight-ounce bottle, for which many, if not most druggists will charge about 1*s.*, and the cost about ¾*d.* for the quinine, five minutes labour, and ½*d.* for the bottle—total, say 2*d.*? He must also remember that Beecham, &c., do all the expensive advertising, and all the druggist has to do is to hand the already-wrapped and labelled article to the customer.

Granted, that Mawson & Swan, Hopkin & Williams, &c., are remarkably qualified druggists, and indeed chemists, but they are only exceptions to the rule. I am well acquainted with the trade, and count many friends in the drug line—men of the highest probity and scientific attainments. I can assure "D.D." that some of my drug friends curse the Pharmacy Act, as they cannot now get apprentices. I consider that, all round, a change in the Sale of Poisons Act would be welcomed, and I vote for it.—I am, yours, &c. J. A. C. O.

BRUSSELS EXHIBITION.

To the EDITORS.

GENTLEMEN,—Will you kindly allow me to announce that the actual opening date of the Brussels Exhibition is March 28

Entry forms duly filled up must reach me as soon as possible after February 1, and the frames should be sent to arrive at my office (carriage paid) on or before March 9.

They will then be dispatched in a joint case or cases, and the carriage there and back will be divided as equitably as possible amongst the exhibitors.

Entry forms will be sent upon receipt of stamps. There are no entry fees, pictures must be framed, but need not be glazed, and only one print in each frame.

There will be no awards, but each accepted exhibitor will receive a commemorative medal.—I am, yours, &c., WALTER D. WELFORD.

15, *Farringdon-avenue, London, E.C.*

SOCIETY FOR ASSISTANTS.

To the EDITORS.

GENTLEMEN,—"Photo" in your last issue asks for a benevolent or protection society for photographic assistants. Like many another photographic worker he calls out in the hour of need for that which, in the hour of prosperity, he might and yet will not provide. Your query is the only answer: "Why do not you and they start a society which seems so much needed?" The opportunity has been given twice through the medium of this column; but, like the Outlanders of Johannesburg, in each case the desiring scores have failed to "materialise" at the critical moment. Must we, therefore, conclude that the photographic workers cannot be organized? I see no reason why they should not be organized. The Assistants' Society of New York is said to be the best and most influential in that city. If in New York, why not in London?

It appears there is 300*l.* going a-begging from the old Benevolent, and I think it would be an act of supreme charity if that sum were granted to form a trade society for the benefit of assistants.

I also believe that such a society, even if worked on strict trade union lines, would, in the course of a year, do more actual benevolent work than did the Benevolent. Contrary to general belief, the trade unions' funds are mainly devoted to relieving distress. For instance, the lithographic printers, a trade closely allied to photography, in 1893, out of an expenditure of about 4000*l.*, spent almost 3000*l.* in sick and unemployed benefit, whilst they spent but 36*l.* in disputes. It is such work that keeps the trade unions going, in spite of very powerful opposition. Why the photographic worker fails to take advantage of such powerful aids in overcoming times of distress I cannot say.

The case of Illingworth *versus* Draycott shows also the need of combination for mutual protection against certain employers, who imagine that their assistants have no legal status, and therefore can be treated in an arbitrary manner.—I am, yours, &c.,

JOHN A. RANDALL.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

EXPOSURE TABLE.—A. J. WELLS. Refer to the author's paper on the subject in the JOURNAL for August 23 last. If the point is not explained there, write again.

PLATE-MAKING.—DRY PLATES says: "Can you inform me the name of any books on plate-making?"—In reply: Abney's *Emulsions*, published by Sampson Low & Co., Fetter-lane, E.C.

STICKY BELLOWS.—J. R. India rubber cloth often becomes sticky when out of use. Rub the bellows of the camera well over with French chalk. That is the best thing we can suggest.

COLLOTYPE.—F. G. CASE. The best work on collotype in English is that of Dr. Schnauss, price 5*s.* It may be had from Messrs. Penrose & Co. The collotype process will be the best for your purpose.

LEAKY ROOF.—PROVINCIAL. As the putty is so badly cracked, we suggest that the whole of it be chipped out, the sash bars painted, and then reputtied. It is the only way to make the roof really sound and rain-proof.

COPYRIGHT.—C. BOYLE. It is not necessary that the photographs bear the imprint "Copyright" to make them legally copyright. You must not assume that, because they do not bear the work, you can copy them with impunity. Indeed, the whole of them may be, and probably are, copyrighted.

LENS.—WM. MICHELL. For landscape work, a single lens is as good as the more expensive doublet form. Indeed, many prefer the old single lens, except for its bulkiness, for pure landscape work to any other. The market price of the one you mention would not be more than about five-and-twenty shillings.

SENSITISED LINEN.—BROMIDE says: "We have an inquiry for linen, prepared in the same way as bromide paper, and would feel greatly obliged if you would tell us if this article is made here, and where we might apply."—Communicate with Messrs. Morgan & Kidd, Richmond. If they do not supply it, we know no one who does.

GOLD PRECIPITATING.—H. W. B. If the chloride of gold formed a muddy solution when dissolved, it is pretty clear that impure water was used. It might, however, be that the solution was made in a dirty bottle. In all probability it is useless now for a toning bath. As it was only a fifteen-grain tube, it is very unlikely that a refiner would buy the solution. The quantity of gold it contains is about seven grains—with some samples of the chloride much less.

GELATINO-CHLORIDE PAPER.—GEO. THOMPSON. The reason of the curling of the prints is that you are using too thick a coating of gelatine, and possibly not of the right character. Also the temperature at which the emulsion is applied to the paper may not be quite right, and that would cause the streaks and markings. Try a harder gelatine, and use a thinner emulsion. The most even coating is obtained by employing a properly constructed machine for its application.

COPYRIGHT.—CURATES. Although the song may, as intimated on the title page, be sung in public without fees, that does not entitle you to reproduce it, with the music, as lantern slides for the use of the children, and audience, during the entertainment. Often, where permission is given on the title pages to perform the music in public, there is also a stipulation that it is not to be copied in manuscript, and photographic reproductious would certainly not be permitted in copyright music.

PHOTOGRAPHING BANK NOTES.—R. E. M. writes as follows: "I recently obtained the loan of a thousand pound Bank of England note, made a negative from it, and from that made some lantern slides, which show splendidly on the screen—the water-mark being well rendered. A friends tells me that I have rendered myself liable to prosecution for copying the note, even for lantern slides. As they are on glass, surely he must be wrong?"—No he is not. It is quite illegal to reproduce a bank-note for any purpose whatever, and you are liable to prosecution for the act.

DETENTION OF SPECIMENS.—PRINTER says: "I should be much obliged to you if you could tell me how to get my specimen prints back from a photographer who advertised for a printer. I have written him three letters, and in the first I sent a stamped directed envelope for same, but have had no reply. An early answer through your letter-box of the JOURNAL will oblige me very much, as I do not want to lose them."—In reply: Lay the facts before the Superintendent of Police of the district in which the photographer resides. That course will (or should) speedily bring back your photographs.

TEN PER CENT. SOLUTIONS.—N. T. inquires what these are?—In reply: They are solutions of such a strength that ten grains of the salt dissolved are contained in every hundred minims of the solution. They can be prepared by adding to each ounce (480 grains) of the salt sufficient water to make up a total bulk of ten fluid ounces. A ten per cent. solution of ammonia consists of one fluid ounce of the strongest liquor ammoniæ (·880) diluted to make ten ounces. None of these are actually ten per cent. solutions in the strictest sense which the words can be given, but they are what are known to photographers as such.

ENAMEL COLLODION.—ARTHUR JAMSON says: "I have been making up some enamel collodion with methylated ether and alcohol, but cannot succeed in getting an even film; it is always 'crapy,' like the sample sent herewith. Can you tell me the cause of my failure?"—In reply: The most probable reason is that the solvents are not strong enough, that is to say, that they contain too great a proportion of water. If it is not due to this, then the pyroxyline must be unsuitable. Given a suitable pyroxyline alcohol, 66 o.p., and ether of s.g. ·715, will make an excellent collodion for the purpose. The fact that the alcohol was methylated has nothing to do with it, in all probability, since a first-class enamel collodion can be made with it.

CHROMATE OF POTASH.—FRED. C. writes: "I sent a written order to the chemist's for some chromate of potass, pure, and received a pale yellow salt in very fine crystals, which the chemist avers is what I asked for, while a friend tells me it should be in large red crystals, or it may be in small crystals, but they are always dark in colour. Does the process of purifying in any way alter the colour, or have I been supplied with a wrong article?"—In reply: The salt supplied is, no doubt, *neutral* chromate of potash, while the red salt spoken of is the acid or bichromate, commonly called bichromate of potash. It depends entirely what the salt is to be used for whether you have been rightly supplied or not; the bichromate is the article most commonly employed in photography.

DISTANCE OF SCREEN.—PROCESS BEGINNER asks: "What is the best distance of the screen from the sensitive plate?"—If he asked a simple question like "What is the best exposure for a landscape?" we could answer him, if we knew what sort of landscape it was, and what sort of light, lens, and stop were employed; but, when it comes to the screen question, we should like to be supplied with a few more data before venturing to reply, and even then we dare say that half a dozen different experts would give as many different answers. The best distance of the screen varies not only with the nature of the subject, the exposure, the size of the stop, and its shape, but also with the character of result required, and the distance that best suited a particular "ruling," under certain definite conditions, would have to be considerably modified if the ruling were altered, or a coarser or finer screen employed. Better try a few experiments.

THE BEST DRY PLATES.—W. J. MAINWARING says: "Will you kindly let me know which are the best dry plates to take photographs out of doors?"—In reply: We can hardly imagine our correspondent puts his question seriously; such, however seems to be the case. Our advice to him is to select the plate which experience tells him is best suited for his purpose.

AMYL-ACETATE.—D. MCGREGOR. Amyl-acetate is a very good solvent for most pyroxylines, either alone or with camphor and spirit. It dissolves celluloid freely, and may be used for repairing celluloid or xylonite articles. We are not surprised that your local pharmaceutical chemist never heard of it. It may be obtained from such houses as that of Hopkins & Williams, or, indeed, any wholesale chemist.

APPRENTICING A YOUTH.—C. MCKAY. If you desire to make the youth a photographer, the only thing we can suggest is that he be apprenticed to a good house, where he will be properly taught those branches of photography that he desires to become proficient in. There is no fixed rule as to the amount of the premium, or the length of the term of apprenticeship; that is quite a matter of arrangement. Of course, the best houses require the highest premiums.

GREASE SPOTS ON COLOURED PICTURE.—A. MILLER says: "Some oil has got splashed on a coloured enlargement that was waiting to be framed through the carelessness of an assistant. I think I have read of some means of taking grease spots out of prints, but cannot recollect where. Can you enlighten me? The picture is a bromide, coloured in water-colour, and the oil ordinary sweet oil."—The method has more than once been given in this column. Drop some pure benzole on the spots, allow it to soak in for a few seconds, and then blot off with clean white blotting-paper. Then apply more benzole, and again blot off. Repeat the application till the grease is removed. If pure benzole be employed, no stain will be left, and the colours will not be disturbed.

MOUNTING AND DEVELOPING.—A. A. ROBINSON writes: "Would you be so kind as to help a novice in two small matters? I. The first difficulty I wish to consult you about is with regard to mounting Ilford P.O.P. I have been recommended to squeegee the prints after their final washing on glass. This, of course, produces a very shiny surface, but I cannot manage to retain this unless I paste the edges only on to the cards, which is both awkward and clumsy. 2. My other fix is with regard to developing. I use Ilford ordinary plates and pyro-soda developer, but find that, before I have got the dark shadows out, the high lights are so dense that, when printing, I have to sacrifice one or the other."—1. If the waterproof backing—to be had from all the dealers—be used, the gloss will be retained. 2. The negatives are under-exposed. Give more exposure, and the plates will develop more harmoniously.

SPECIFIC GRAVITY BULBS.—WENTWORTH asks: "Is it absolutely necessary that the specific gravity bulbs recommended for taking the strength of ammonia by Mr. Haddon be of glass, or rather is a glass bulb the only form in which the principle can be applied? My reason for asking this is that I was amused on seeing an ingenious youngster of my acquaintance adjusting his ammonia solution by means of a small cork float to which was attached by means of a fine wire a leaden weight. He assured me that, after carefully adjusting the balance between the cork and the lead, which he had done by comparison with a hydrometer, his home-made appliance was just as good as the other, and certainly in principle it would seem so. Is it?"—It matters not of what material the instrument is made, provided it is, in the first place, accurately adjusted and not liable to change or variation. In the latter respect glass has the advantage most decidedly over cork, lead, or, indeed, any metal; but, so far as the principle is concerned, the cork float is equal to the glass bulb.

CHLORIDE OF COPPER.—J. F. G. says: "I have been recommended to use chloride of copper for toning transparencies, bleaching the image first and redeveloping with whatever developer will give the tone required. In a back number of the ALMANAC I came across a formula for making the chloride in which it is spoken of as a white insoluble powder, whereas a small quantity of solution given to me by the friend who recommended it was greenish-blue. How is the white powder got into solution if it is really insoluble?"—The formula in question was apparently copied from a foreign source, and refers to cuprous chloride, or subchloride of copper, and not cupric or perchloride, which is the salt required. The latter forms green crystals when in the hydrated state, or brown when anhydrous, and is very soluble and deliquescent. If not readily obtainable, it is easily made by dissolving together sulphate of copper and common salt in the proportions of about two parts by weight of the former to one of the latter. The resulting solution contains chloride of copper, and its strength is immaterial provided it is strong enough to bleach the image.

INSTANTANEOUS EXPOSURES BY HAND.—PHOTO-CYCLE says: "Do you think it possible by practice to expose rapidly enough by hand for ordinary subjects, so as to dispense with the use of a shutter, which I find always to be getting out of order? A friend of mine says it is, and, in proof of his statement, shewed me a picture of two cyclists racing at full speed past the camera, both of them being sharp enough to be easily recognisable. I can't manage it myself, although I have tried very hard."—Ask your friend to let you see him repeat the operation, then believe him—not till then. A very little calculation will show the absurdity of the thing. At racing pace the cycles would be passing at a rate of, say, thirty feet in a second, and at such a pace, in order to secure sufficient sharpness for the figures "to be recognisable," the exposure would have to be certainly not longer than the one-hundredth part of a second, and that would mean a movement of about one-third of an inch. It would depend upon the distance from the camera how far "recognisable" the figures would be then; but do you imagine that mere manual dexterity could effect such an exposure? It is, we repeat, absurd.

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EX CATHEDRÂ.

We are in complete sympathy with the objects of the National Society for Checking the Abuses of Public Advertising, the annual meeting of which was held last week, and at which such speakers as Alfred Waterhouse, R.A., William Morris, W. B. Richmond, R.A., and other men of artistic light and leading lifted their voices in protest against what was termed "the destruction and degradation of natural beauties" by ugly advertisement boards. There was encouragement in the fact, said Mr. Waterhouse, that a decided check had been put on field advertising, which at one time threatened to leave no beautiful spot undesecrated.

* * *

In this, only one of the many abuses the Society is laudably working to remove, landscape photographers are, or should be, so peculiarly concerned that we are surprised the Society has not received the co-operation both of individual photographers and photographic societies generally. The prevention of urban defacement, due to the boards, posters, and sky signs of enterprising advertisers, is a matter that must be approached by the light of modern utilitarianism and commercial requirements, and is therefore beset with difficulties of a more or less insuperable character. With regard, however, to the dotting of English landscapes with huge boards advertising pills or ointments, the volume of the outraged artistic sense and sentiment of the community is so overwhelming that it is only with difficulty their further existence can be allowed to tarnish nature and offend the eye.

* * *

We wish the Society every encouragement and success in its endeavours to stem the tendency that undoubtedly exists to turn public beauty spots into so many backgrounds for the blatant boastings of quack-medicine vendors. A bill designed to stop this wholesale disfigurement of the country-side is to be brought before Parliament, and if, as we hope it will, it passes and becomes law, there is not a lover of nature in the land who will not feel grateful to the Society, whose supporters should include every photographer.

* * *

The veteran photographer, optician, and mechanician, Mr. F. H. Wenham, sends us this week an article entitled *Electrography, or Images obtained by Induction* (see page 84), which will be read with great interest by those who are interested in the Röntgen method of photographing with the X rays. Mr. Wenham points out that electrical luminosity is not essential to the production of chemical action on a sensitive surface, and, quoting some experiments of Dr. Draper, of New York, made in 1840 in obtaining images on Daguerreotype plates by means of the action of the discharge from a Leyden jar on opaque bodies, says that Röntgen's work appears to have been to some extent forestalled by these long-forgotten experiments.

* * *

In connexion with the same subject, Mr. W. Brooks draws our attention to the fact that, in March 1877, he read before the South London Photographic Society a paper entitled *Magneto-photography*, and printed at page 112 of our volume for that year. In this paper Mr. Brooks described some experiments by which he got an image in total darkness in a shut-up box. He experimented with an ordinary horse-shoe magnet about eight inches long which he placed in a box, poles uppermost, and, three-eighths of an inch above the poles, a card perforated with lettering. The plate was placed one-eighth of an inch above the card, which was blackened. An exposure to the magnet in total darkness for fifteen minutes gave an image

on development; but the strangest part was that some almost invisible lettering on the non-perforated part of the card also developed up. Mr. Brooks informs us that he proposes resuming his experiments.

* * *

The humourists have, of course, seized upon the Röntgen method of photography as a vehicle for the display of their wit and fancies. An esteemed correspondent, Mr. C. H. Crosby, of Chicago, writes us as follows, under date, January 20:—"By to-day's mail I send you part of copy of *Chicago Tribune*, of yesterday, with account of a very astonishing (?) advance in photography. I presume same is a 'fake' or humbug. At your convenience and pleasure, will you please tell us about it."

* * *

By this time Mr. Crosby will have learned that neither "fake" nor humbug has anything to do with the wonderful power which the X rays have of conveying to a plate a developable image of an object through an opaque body. Our Chicago contemporary prints blocks of the now familiar hand, the contents of a purse, &c., and also makes the following remarkable statement, which is also illustrated:—"Perhaps the most notable experiment related, which illustrated with graphic clearness the eccentric power of the new discovery, was the photograph of a man seated beside a young lady before the photographer in ordinary dress, but whom the negative shows a perfect skeleton. To test the clearness with which the new process would reproduce the skeleton of a living subject, negatives were also taken by the ordinary method. In the first case the spinal vertebræ were reproduced in every detail, forming a ghastly specimen of realism."

* * *

The X rays, so far as we have been able to learn, are not claimed by Professor Röntgen to betray such discriminative gallantry as that which our American contemporary infers them to possess. The illustration shows the skeleton to have his arm round the lady's waist, and not visible through it, a fact which dispels any attempted explanation that two exposures were made. But, of course, the experiment referred to was not actually made.

* * *

In view of the interest excited by the topic of the hour, the last number of the Royal Photographic Society's Journal is especially valuable. Mr. J. W. Gifford's two papers on *Photography through Opaque Substances* are given, with several illustrations, the latter of which are of an interesting nature, two of them being from shadowgraphs produced without the intervention of a Crookes' tube. The number also contains a full description of the new Stigmatic lens by Mr. Aldis.

THE RÖNTGEN RAYS.

Since the first days of photographic discovery no such excitement has been caused in the scientific and popular press as that produced by Professor Röntgen's recent discovery. The daily papers and illustrated periodicals contain voluminous reports of what Professor Eder has called a "new form of energy," and "one of the most important discoveries of the century." The whole public are familiar with the reproductions of the pictures obtained by that *savant*, and his numerous imitators. Broadly speaking, what he has discovered has been the power of certain radiations (using the term in a wide sense) to affect photographic films, though screened by objects hitherto considered absolutely opaque, that is to say, opaque to such light or spectrum radiations that have yet been experimented with. Nearly all bodies are permeable, more or less, by this agent, which meanwhile he has termed X rays. For some time after the publication of the discovery attempts were made to show that the same effect had been produced years ago by other investigators, but it seems to have been accepted that the X rays have been discovered by Röntgen alone. So strongly is this felt, that at the meeting of the Paris Academy of Science of January 27 Professor Koellicker's proposal that the new rays should for the future be called Röntgen's rays was received with acclamation.

Röntgen rays penetrate most substances, though the transparency is not complete. During the examination of many substances it was found that the photographic power of the rays passing through them diminished in power with increase of thickness of the material experimented with. Some objects, however, are almost opaque to the Röntgen rays. To use the discoverer's words, his detailed experiments "lead to the conclusion that the density of the bodies is the property whose variation mainly affects their permeability." Bone is almost opaque to them, muscle fairly permeable. Hence, if a hand be laid on a dry plate and exposed to the new rays, they pass through its fleshy part without much loss of power, but do not pass through the bone, and, in consequence, a developable effect is produced. No effect is produced underneath the bones, but outside them the radiations act, hence a negative of the bony structure is brought out upon development. This of itself is nothing remarkable, for, if a strong light from an ordinary source were concentrated on the hand, there is no doubt that a somewhat similar effect would be produced, and in a much shorter time. But the peculiarity shown with the new rays is as follows: First, it is immaterial whether the plate be placed in a closed dark slide or in a box of aluminium, of ebonite, or of many other substances, the action takes place equally well as the rays penetrate them; and, secondly, while with sunlight, &c., acting on the hand, the skeleton print would be "fuzzy" through the flesh diffusing the light, with the Röntgen rays no diffusion takes place; they pass equally well, for example, through muddy water as through clear. This is a point of paramount importance to bear in mind when endeavouring to gauge the future possibilities of the "new photography," as it has been termed.

If our explanation has been followed, it will be perceived that the results so far obtained are not photographs in the ordinary sense of the word, they are merely photographed shadows. Indeed, most of the published accounts now speak of them as shadow photographs or shadowgraphs. At this stage we would like to make a suggestion as to the term to be used in describing them. Shadowgraph is certainly a short word, but is contrary to all rules of etymology. Our suggestion is that the new pictures be called sciographs, which would be expressive enough without a further addition of "photo."

We may now dwell a little upon the manner of producing the new rays. Though Messrs. Swinton & Stanton had little success with this method, their discoveries clearly enough state that they passed the discharge from a large induction coil through a Hittorf's vacuum tube, or a well-exhausted Crookes' or Lenard's tube. By the bye, our good friends on the Continent are rather given to ignoring the English inventors in naming apparatus. Crookes' radiometer (to the invention of which all their discoveries are really indebted) was very quickly imitated in Germany, whence we had

Geissler's tubes." Crookes' tube is a highly exhausted bulb or tube, in which are fused two terminals of metal. When the current, as above, is passed through, these negative and positive terminals are surrounded with a glow. The cathodic rays we read so much of are simply those from the negative poles. Crookes' tubes are made to contain varying substances, which fluoresce in the rays. Röntgen's rays are those emitted by the fluorescing substance where excited by the cathode radiations. Glass is not very transparent to them, so that their actual photographic power is much diminished in passing through the glass walls, and it is proposed to substitute aluminium for that portion of the glass that intervenes between the emanating Röntgen rays and the sensitive plate. So far, nothing has been found which will decidedly deflect or reflect them; prisms and lenses have no effect in the hands of Herr Röntgen and others, glass, bisulphide of carbon, paraffin, and other bodies having been tried. By placing certain pieces of metal on the glass side of a dry plate, and then passing the new rays through the film, there was a darker impression above these pieces of metal; this would appear like a reflection, but Professor Röntgen cannot pronounce it a case of reflection.

Though the new photographs may be pronounced "mere shadow pictures," it is evident that they are at least comparable to microscopic images of an object illuminated by transmitted light which, as every one knows, are only really sharp in one plane, but are yet capable of giving invaluable records on the photographic plate.

This is briefly how the matter stands at present. The direction in which further progress may be expected is first in getting a stronger radiation by using a transparent substitute for the slightly transparent glass, and by increasing the intensity of the initial radiations. Secondly, by obtaining a figure exceeding in sensitiveness those hitherto employed. Possibly Professor Schumann's film might prove more sensitive. Thirdly, by experimenting with a large variety of substances in the endeavour to find one that will reflect or refract the rays. If such could be found, a great increase of rapidity would be obtained, and intense sharpness could be brought about by reducing the emitting radiant to a point, although the sciographs so far produced are remarkably free from penumbra. Again, variations of temperature of the plate, or the medium through which the rays are allowed to pass, may materially alter the ratio of impressibility, or possibly lead to discovery of refraction or reflection.

We cannot conclude this survey without referring to two other remarkable sets of investigations suggested by Röntgen's work. At the meeting of the Paris Academy as above, M. d'Arsomval describes some experiments made by M. Gustave Lebon. He stated that the radiations from an ordinary petroleum lamp flame were capable of influencing a plate though covered by a sheet of iron about an eighth of an inch thick if exposed for tw or three hours. It is proved that it is not heat rays that produce these effects.

Finally, we may refer to the letter in the *English Mechanic*, over the signature of David E. Packer, Astro-Physical Station, S. Birmingham. It states that, "from innumerable experiments made during the last six months, it has been found that metallic plates, foils, and films are relatively transparent to solar radiance of high refrangibility, and that photographic plates screened by such media during exposure to direct sunlight are affected in proportion to the thinness and electrical conductivity of the interposed screen." Pinholes instead of lenses gave splendid results of the solar corona.

Height of the Barometer.—Three weeks ago we called attention to the abnormal height the barometer had registered in London, 30·92. Since then it has attained the same height in the metropolis. It is stated that on only five occasions, during the last hundred-and-twenty years, have the readings exceeded 30·9, and it is a curious circumstance that two of those occasions should have occurred within about three weeks of each other. High readings of the barometer, in the winter, are not always propitious to photography, as they are usually accompanied by calms and fogs, and that was the case last week.

Price of Engravings.—Last week there was a two days' auction sale of rare old engravings, by Messrs. Robinson & Fisher, at their rooms in King-street. It is interesting to record some of the prices realised. An *Apollo and the Nine Muses*, after Cipriani, by Madame Bovi, fetched 48*l.*; *Mrs. Fitzherbert*, after Cosway, by J. Conde, 18*l.*; *Guinea Pigs*, (two) after Morland, by Bartolozzi, 36*l.*; *Lord Gordon's Children*, after Sir Joshua Reynolds, by Simon, 43*l.*; *Louisa*, by J. R. Smith, 45*l.*; *What you Will*, in colours, by the same hand, 53*l.* 11*s.*, &c. It is not at all surprising that fine examples of the old line and mezzotint engravers realised such good prices as they did at this sale, for both styles of engraving may now almost be looked upon as a lost art. The old masters of it have died off, and no new ones have been trained to take their place, and it is very doubtful if there will be in the future. Photogravure cannot well be charged entirely with bringing this about, for, long before it got a firm hold, there were but few engravers of the old school in existence, and the majority of those had passed their prime. Each year will therefore add to the value of engravings by the old masters of the art.

Ugliness in Art.—A well-known writer in this month's *Nineteenth Century* complains that artists are losing, to a great extent, the power of appreciating the beauties of nature; and the fault is attributed to the want of loveliness in the ordinary surroundings of modern life. It is asserted that men living in Cromwell-road, Kensington, or in any similar thoroughfare in London, or a Continental city, have their ideas dulled and dwarfed by the atmosphere around them, "and this perversion of natural instincts in them makes the tendency to replace beauty by eccentricity and by weirdness fatally frequent;" and we learn, too, that their critics obey the same influences, and that "modern criticism is characterised by what appears to be a total incapacity to appreciate the quality of beauty, a total insensibility to its absence from modern art." We fear that the charge is too true, and most thoughtful persons will agree with us, especially if they happen to have visited the Dudley Gallery at the time that the New English Art Club have temporary possession of that Egyptian temple. Possibly too, when the Photographic Salon hold sway there, pictures may be found on those walls in which beauty is conspicuous by its absence. It is strange that so much ugliness in art and photography should gravitate to that room in Piccadilly, and our only consolation is that the gallery is not a big one.

A Novel Studio Accessory.—Many of our older readers will, most likely, remember that some two or three decades ago there was an amusing controversy in the photographic press about a picture that was shown at one of the Society's Exhibitions, in which a seagull was depicted on the wing. The point raised was whether it was a living gull, or only "a gull on the public," as, at that period, the collodion process was the most sensitive one in vogue. Recently a gull—a real seagull—in connexion with photography, has been engaging the attention of gentlemen of the long robe in the Law Courts. It appears that a photographer, Annie Simpson, had tamed a seagull. It would answer to its name, come when called, would take food from the hand. The bird was, and probably is, still used by its owner in her business. The lady was summoned before the Justices sitting at Buxton for cruelty to the bird by cutting its pinion. The Justices, though thinking there had been cruelty to the bird, dismissed the summons on the ground that the bird was not a domestic animal within the meaning of the statute.

Against this decision an appeal was heard at the Law Courts a few days ago, with the result that it was dismissed, the Judges holding that a seagull is not a domestic animal.

During the hearing of the case in the Court of Appeal, one of the learned Judges (Mr. Justice Williams), in reference to the bird being used in the business, remarked that "a stuff-d bird would do as well as a live one for the photographic pictures." To this the counsel for the appellants replied, "No; for any one could see in the picture whether it was a stuffed bird or a live bird." That is not all, however, as there is a novelty in having a real live bird as an accessory which is not the case with a stuffed one; and there is little doubt that it does add to its mistress's business, notwithstanding the alleged cruelty.

A New Engraving Process.—One day last week, Professor Heromer gave a demonstration at the Fine Art Society's on his patented method of producing engraved plates. This method has been duly lauded in the lay press, and by artists, because it preserves the actual touch of the artist himself. The method is this: A copper plate is silvered on the surface; on this the artist paints his picture in a particular kind of black ink, then, while the work is tacky, it is dusted over with a certain powder which is said to adhere in a discriminating way; the coarsest particles adhering only to the deepest shadows, and the finest only to the delicate tints this powder also gives a conducting surface. After the superfluous powder has been dusted off an electrotype is made, and that forms the printing plate.

Some little mystery is made, in the reports we have seen of this process, as to what the special ink and the powder is composed of. We find, on reference to the specification—Herkomer & Cox—that the ink is composed of almond and castor oil, mixed with German or lamp-black—equal parts of the two oils and the black. The powder is composed of equal parts of asphaltum and copper-bronze powder. The latter gives the conducting surface. We may have something more to say on this method of producing printing plates, as compared with some other processes at an early date. *Apropos* of a letter, in a daily contemporary, from Mr. Wedmore, extolling the process, the following amusing letter "descriptive" (?) of the Pretsch process, appeared in the *Standard*, which will, doubtless, raise a laugh with those familiar with that process:—

"The New Artistic Process. 'Sir,—Mr. Wedmore's letter in the *Standard* of to-day carries me back to the Fifties, when Herr Paul Pretsch, an Austrian *savant*, established himself in an old house in Holloway, where there were gold fish in a pond in the garden. (All this helps the memory.) He took his *positives* on the roof, which looked like a small light-house, then spread his *viscid red mixture upon a glass plate over the picture, and when dry got a depressed replica upon a gutta-percha mould.* This mould was then carefully levelled *by a spirit machine, and the nitrate of silver solution poured over it,* after which he got a matrix to print from by *hanging the mould in the acid bath with the voltaic attachment.* He called this a photo-galvano-graphic process.'" [The italics are ours.]

ELECTOGRAPHY, OR IMAGES OBTAINED BY INDUCTION.

The recent accidental discovery seems to be based upon a misconception that light, or some hitherto unknown modification of it, has something to do with the effect. A Crookes-vacuum tube in a state of electric luminosity is not at all essential; a sparking coil, or a Wimshurst influence electrical machine, would be preferable. It is well known that, if a body is charged with static electricity, such as the prime conductor of an electric machine, it will induce a charge, or, if uninsulated, a current of electricity in all surrrounding bodies, and these, again, will influence and charge other bodies, even through plates of intervening substances. These conditions may be quite unaccompanied with any degree of luminosity, yet it may be taken for granted that they exert a feeble chemical action on a highly sensitive plate, and interposed bodies, or substances of different surface structure, or parts of varying inductive capacity, will develop a structure otherwise invisible and unknown.

In connexion with this subject I take the following extracts from the experiments of Dr. Draper of New York, published in the *Philosophical Magazine* for October 1840, premising that the old, slow Daguerreotype process only was known at that time:—"I was desirous of ascertaining if electricity had any similar effect. The coins and medals upon it (the sensitive plate) were submitted to discharges from a large Leyden jar. On exposing it to mercurial vapour, the impressions were very prettily brought out. . . . . With a view of ascertaining the distance at which bodies might be copied I placed upon a plate of polished copper a thick piece of plate glass, over this a square of metal and several other things, each being larger than the body beneath. These were all covered with a deal box, which was more than half an inch distant from the plate. Things were left in this position for a night. On exposing to the vapour of mercury, it was found that each article was copied, the bottom of the deal box more faithfully than any of the others, the grain of the wood being imaged on the plate. . . . . I feel convinced that we have to do with some thermic influence, and that it will eventually be found that some purely calorific excitement produces a molecular change, or that *a thermo-electric action is induced which effects some change in the polarities of the ultimate atoms of the solid.*" (Italics mine.)

It appears, therefore, that the subject has to some extent been forestalled by these long-forgotten experiments: I may mention a fact familiar to most photographers. Oftentimes a piece of sensitised paper has been placed within the pages of a book in order to preserve and shield it from the action of light, and been forgotten for some days. It will then be found that the whole of the printed matter has become transferred to the sensitive paper, so as to be distinctly legible. This phenomenon has been peremptorily dismissed, with the assertion that the silver has been reduced by the action of the carbon of the printer's ink. As *absolute contact* is not necessary to produce the impression, I was never satisfied with this explanation, as it cannot be imagined that there is an ever-continued exhalation of carbon from the ink; therefore some other reason is required, and Professor Draper's electric suggestion is probably the correct explanation. Some paper, when rubbed, is highly electric, and it might be worth while to place the sensitive photographic surface beneath sheets of paper that have been excited by rubbing, and so ascertain if the effect is enhanced or the time of exposure shortened.

No one will now incur the hardihood of repeating the old challenge of the clairvoyants of spreading a bank-note at the bottom of a box to be presented to any one that can tell the number without opening the box.

F. H. Wenham.

DIGRESSIONS.

II.—Limitations. The Nude.

Although I do not disagree with the principle expressed in the words, "Liberty for All," I know that liberty is all the better for a little restraint, and that it makes as much for progress to know what *not* to do as what to do. A brilliant flash of silence has been known to have more effect than most eloquent speech, and there is more artistic satisfaction in the simple breadth of a luminous twilight than in the noisy and multitudinous detail shown under the mid-day sun. Over-elaboration is a frequent destroyer, and a painting is sometimes at its best long before it is supposed to be finished. Art is to some extent suggestion. Occasionally, however, the highly finished reigns supreme, but it is by aid of other and greater qualities. It is possible to have too much performance to leave room for promise, and there is much poetry in promise. A few scratches of an etching needle may show more genius than an altar piece, though this great truth has been much depended upon and worked by charlatans.

Most excellent work is sometimes thrown away because bestowed on a wrong object, and, to come to our own art, very perfect photography is often wasted in a mistaken direction. Indeed, in photography it is becoming more and more a matter of serious study what to do and what not to do.

Admitting that there seem to be no bounds to the application of mechanical photography, there are many limitations to its artistic application that should be recognised and acknowledged.

Here is a quaint example. In a recent number of one of our favourite American photographic magazines, the author of an illustration excuses the badness of his picture by explaining that "the day was terribly hot, and the poor cow was tormented by legions of flies, and we found it impossible to get the composition we wanted." Now, surely the artist lost sight of several lawful limitations. The first was that the picture should not have been taken at all in such weather. A cow tormented by legions of flies should not have been selected as a subject for pictorial treatment; moreover, if the photographer cannot get the composition he wanted, and he fails to realise his intention, he should not ask our acceptance of some inferior want of intention. In this case the photographer rightly gives the production up as a work of art, but he does not explain why the negative, which was not what he wanted, was not destroyed at once. I suppose not one in a hundred negatives survives its birth, but there is still nothing like enough destruction done. The negative to which I have referred was not all waste. Nothing is wasted in America. On the principle, I suppose, that Providence brings nothing into the world without some good purpose—not even sugar-candy or the new developers—failing as art, the photographer turns his negative to use, and concludes his explanation with the usual tag to American illustrations, an advertisement.

"But it speaks well for C——'s plates with metol developer." Here ought to be another limitation. One of the things most calculated to knock all poetry out of a work of art is turning it into an advertisement of the material of which it is made, like a Mellin's baby.

Turning over the American magazines, we occasionally come to a lovely portrait or *genre* picture, and, of course, want to know the name of the picture and the producer. For a long time the young lady sitter seemed to be christened, in very large letters, "Aristo" or "Ilo," or some such names, which showed a want of originality in the artists. Now she is "Somebody's Half-tone." Then the cows and sheep began to bear the same names, and further investigation showed that the names meant the paper or the plate used in their production. I am glad to see that at least one of the American papers, the *Photographic Times*, has given up the practice, and respects art.

It is possible to get into two minds over the limitations of our art. On the one side I want all possible liberty; on the other, I have a feeling that no artist, in whatever material, should transcend the bounds of the process which he has adopted. The end should be truly adapted to the means. "One of the most striking signs of the decay of art," says Goethe, "is when we see its separate provinces mixed up together. The arts themselves, as well as their varieties, are closely related to each other, and have a great tendency to unite, and even lose themselves in each other; but herein lies the duty, the merit, the dignity of the true artist, that he knows how to separate that department in which he labours from the others, and, so far as may be, isolates it." However, it is not fettering liberty to endeavour to prevent one method or style competing with another, or to save ingenuity from taking false directions.

Taste has improved the world by limiting different materials to their own natural appearances—wall paper, for instance, no longer pretends to be wood or marble—without limiting art, and I don't know that it is necessary for photography to look like the results of any other art. On the other hand, it need not insist on the brand of its calling; there need be no insistance on its looking aggressively photographic. Each art should respect its own individuality, but not worship it as a fetich.

Photography can only represent what is before it. If we are to accept this stereotyped saying, which we will for the moment, it helps to clear away and place outside our boundaries many things that are not worth sighing for, and better out of our way. It clears off all the past, the dead and gone and vanished. The true artist in all materials has still something of the "vision and faculty divine." Much is denied to us in poetry, history, and legend—we are not allowed to guess and call it true; but we have plenty left, and shall have more when we have eyes to see. But the photographer should always keep in mind that, if, in the nature of things, he is bound to have his object before him, he is not bound to see it as others see it. Indeed, I do not think any two photographers can see or represent precisely alike. Individuality is bound to come in, and a very little variation seems to make all the difference. There is that curious instance, which will be a precedent, in the last Pall Mall Exhibition of two pictures of the same subject, under similar conditions, of nearly the same size, hung close together, the only serious difference seeming to be in the title; yet the Judges were able to detect a variation—some subtle poetic aroma, perhaps—in one of them which made it worthy of a medal, and the other unworthy.

It is the business of the artist to see beautifully, and to show men what they might see if they also were artists.

But, whatever limitations we may find prudent in our practice, we should allow none to its possibilities. We should use our limitations only for convenience and to simplify our work. Within ordinary bounds, the art has much more flexibility in its technique than some critics will allow themselves to believe; and science has done much to retard the true interests of photography, except as a handmaid to other arts and many trades. Here is a new instance. Artists are now proving that carbon prints can be developed from the front. Science has been telling us for years that this is impossible, and now says—at which we smile—that, if it is possible, it is a modification of something suggested nearly forty years ago by science, and that its excellence depends on a defect!

What is it that suggests that some remarks on the nude in photography would be in place here? Ought it to be one of our limitations, or would that demand be too narrow?

In the present age and condition of the world, the nude in photography is an anachronism, except in the uncivilised portions thereof The nude still exists among savages who have not yet been civilised out of their taste for the manners and customs of Paradise as we are taught they existed; but it does not seem up to date for young gentlemen to walk about undressed, and for young women with wasp-like waists and distorted toes to disport themselves "mit nodings on." The nude and the undressed are different things; these figures would be not so much nude as undressed. To some people this would mean the same thing, but "oh, the difference!" I do not say this out of any consideration or respect for Mrs. Grundy or her tribe, it is a matter of art. The nude is the divine ideal; the undressed is the modern naked girl, and, like the angel with the vicar, she makes no apology for her impossibility; and, as I have suggested before, the impossible is an established limitation.

The nude has no excuse if not beautiful; the modern nude is not beautiful. By the bye, if anybody wants to prove that it is, photographic evidence will be accepted. If many people were asked what was the most beautiful thing in the world, they would say without hesitation the Venus of Milo; the other end of the scale is the modern model for what Trilby calls "the altogether." The least touch of imperfection in the form, or awkwardness of motion, and down comes the ideal to earth, and is of the earth, earthy.

There is too much realism in the photographic nude. The nude belongs to poetic art, and in this, above all, we must accept strong conventions. The object is not nakedness, but an opportunity for the display of graceful lines and forms, delicate shades, and gradations; the subject must be many planes above reality. Absolute realism never succeeds. Effort is now being made to introduce "real conversation" on the stage; but it only succeeds—if, indeed, it does succeed—in afternoon-tea comedy. The poetic drama must be in verse of some kind; so also must the nude be idealised, and who can idealise a modern waist or a distorted foot—or, indeed, any human form marred by artificial devices? It has been wisely said that the ideal is the blossom of the tree, realisation is its fruit—and sometimes the fruit sets the teeth on edge.

The only excuse, then, for the nude is beauty, to which may be added the skill with which it is executed in line or colour. It is too late for a photographer to claim credit for any great amount of beauty of execution: there is no opportunity of showing beauty of colour, and beauty of line is handicapped by want of beautiful

models. Fashion has destroyed nature here. What it has done is clearly explained in the familiar punning verse:—

"It matters not, though doctors may
Declare that it will kill,
The awful corset's here to-day,
And stay of corset will."

Moreover, if perfect models were possible to make the nude in photography acceptable, we should want the universal artistic refinement of the Greeks or the indifference of the savage. We hold a middle place, our cultivation is too artificial.

Just a final word. It comes as a matter of course for some people to say "studies of the nude would be so useful to the artist," meaning the painter or sculptor; meaning those who ought to be quite competent to paint or model for themselves. For my part, I would no more offer to design his work for the painter, than I would to finish his picture for him—however much I could see it wanted it. The more the painter does without "outside help" the better. The better for his picture, himself, and pictorial honesty and morality. That a vast quantity of valuable property of this kind is appropriated is certain, but this kind of flat burglary is becoming more dangerous daily, particularly when the delinquent takes Oliver Cromwell's advice, and copies "warts and all" on the tiger's nose. Then the copyist gives himself away, and, if there is a Gambier Bolton about, he who "takes what isn't his'n" is found out and has to pay.

H. P. Robinson.

BY THE WAY.

The past month has undoubtedly been one of excitement in photographic matters, owing chiefly to the publication of Professor Röntgen's remarkable discovery of the so-called photographic action of certain rays whose nature it is, up to the present time, impossible to classify with any certainty. It seems absurd, however, to describe as photographic an action that goes on in absolute darkness and is produced by rays that are quite invisible to the eye, and which, moreover, appears to set at defiance all the laws that govern the action of ordinary light. Whatever may be the true nature of the manifestations so far obtained, there can be even now little doubt on the subject of the ultimate value of the new power in various directions; and, whether or not subsequent researches prove the X rays to be subject to the ordinary laws of reflection and refraction, it seems that already, in the present crude condition of our knowledge of the subject, there is a wide field open for experiment.

It is true the investigation of such questions as this is confined to few hands; but this is perhaps not a misfortune, but otherwise, since those who possess or have access to the needful scientific appliances are just those who are individually, both by training and by instinct, capable of accurate judgment in investigations of this character. The amateur *pur et simple*, using the term in its highest and best signification, is a useful, and maybe a valuable, assistant in some directions; but in matters of pure science, involving, as does this, the careful weighing and comparison of facts, theories, and hypotheses, it is better that the work should be left to thoroughly trained minds and skilled hands. It is, at least, satisfactory to know that, young as is the new science, there are already so many competent workers not only able but willing to devote their energies to its investigation; and, though the outcome of it all may possess little practical usefulness to the ordinary photographer, we cannot but, one and all, look on with the greatest interest at the gradual development of this, the latest of modern scientific wonders.

Turning from Professor Röntgen's discovery, we come to Professor Herkomer's invention, if such a term can be applied to anything appertaining to art, for, be it noted, the title of "New Art" is claimed for this latest method of engraving, though how one who has proved himself so bitter an enemy of photography and kindred or cognate methods of reproduction can consistently claim such a title for so mechanical a method is rather a puzzle.

We have not to consider in this connexion the broad question as to whether photography is or is not an art, or only a mere mechanical process, but the narrower one, whether a picture by Professor Herkomer's "New Art" is any more an artistic production than a photogravure or other photographic reproduction direct from the work of an artist. So far as I am personally concerned, I should answer, without any hesitation, in the negative, and I should go further and say that the photographic rendering would, in ninety-nine cases out of a hundred, be superior to the "autographic."

Professor Herkomer's idea appears to be that because, to descend to mere technical terms, the "resist" is applied to the metal plate by the discriminating brush of an artist instead of being uniformly spread in the form of a varnish to be afterwards cut through with the graver or etching needle, or, on the other hand, by photographic means, that the result must possess greater artistic claims. But he quite overlooks the fact that the work of the artist ceases with the transference of the idea to canvas, paper, metal, or whatever basis may be selected for its translation into graphic form; indeed the artist may be said to complete his task with the inception of the idea, and the mechanician then commences, be he painter, engraver, etcher, or *photographer*. It does not seem to matter much from an art point of view whether, in the case of an engraving or an etching as it reaches the public, the "artist" does his work, including the mechanical portion that is inseparable from it, upon the canvas or upon the metal plate, with the brush, the etching needle, or with "bits of wood and the finger tips;" but, from the point of view of quality of result, it does most certainly appear as if a better result would, or should, accrue from a proper division of the labour, leaving to the artist the conception and rendering of the subject in whatever medium suits him best, and to the engraver or etcher the task of translating it into suitable "diffusible" form in the best manner possible.

But Professor Herkomer's claim is that by his method the artist is enabled to "reach the masses with his autographic touch," or, in other words, is enabled to do without the aid of photography what photography is so well known in this direction to be capable of doing, namely, to faithfully reproduce the original without losing or destroying the idiosyncrasies of the individual artist, a task so difficult to the ordinary engraver or etcher. But, then, Professor Herkomer abominates photography in any form, but "process" in particular, because it renders art "diffusible" at a cheap rate, or comparatively cheap; and even Professor Herkomer recognises the advantage to the artist of "diffusibility," or, in other words, he knows that the reproduction in popular form and at popular prices adds materially to the pecuniary value of the artist's work, and this branch of the work he wishes to keep in his own hands.

But, it may be asked, is such a method as that of Professor Herkomer's likely to preserve the "autographic touch," the individuality of the artist, any better than would be done by the average engraver or etcher, or half as well as by photography? I think not, more especially if we take into account the fact that the artist becomes his own engraver, and takes up a task for which he has had no special training; for it must be borne in mind that Professor Herkomer lays stress on the fact that, in working his process, the artist has "no new technicalities to acquire, technicalities that have hindered many an artist from taking to plate work." Evidently, then, the "new art" is regarded by its author as not only "autographic," but also "automatic," as requiring neither skill nor brains in carrying it out, so far as the mechanical portions are concerned.

Many photographers will be perhaps better able than Professor Herkomer himself to judge how far the ordinary artist, devoid of technical training, will be likely to succeed with this combination of moulding and electrotyping; for, much as the Professor detests photography, he is not above taking a few hints from its methods. Thus his new "autographic method" of forming a printing surface looks very like a combination of the "dusting-on" process, Colonel Waterhouse's process of photogravure and electrotype; and, though each of these three processes requires for its individual working a considerable amount of knowledge and manipulative skill, their combination is to present no difficulties to the artist who is able to transfer his ideas in a "thick black pigment resembling printer's ink" to a silvered copper plate. The artist by this means is to be able to reach the public direct with his own "autographic touch" unsullied, and, above all, though it is not specifically mentioned,

"scoop in the coin" without the interference of any middleman in the shape of the engraver or photographer. We shall see.

I read in last week's JOURNAL a brief notice of the death of Professor Henry J. Newton of New York, who, some fifteen to twenty years ago, figured very prominently in the amateur photographic world of America. On the principle of *De mortuis* &c., I should be loth indeed, to write anything deregatory of one who in his lifetime was an ardent and enthusiastic worker in the interests of photography; but the absurd, though well-intentioned, claims made by his "obituarist" if allowed to pass unchallenged into "history" in the columns of THE BRITISH JOURNAL OF PHOTOGRAPHY, of all places, would lead to bring ridicule, rather than honour, to his memory.

Amongst other things it is stated, on the authority of the *Scientific American*, that the late Mr. H. J. Newton "recommended the use of nitrate of ammonia in the silver bath for the sensitising of albumen paper, by which the need of preliminary fuming with ammonia is avoided." So far as I recollect, Mr. Newton's name was little, if at all, known in connexion with photography previous to twenty years or so ago, but the introduction of nitrate of ammonia into the silver bath was made by Marlow in 1860 or 1861. Its use was to enable a bath weaker in silver to be employed, and the same end was later arrived at in the States by ammonia fuming. If Newton rediscovered the fact that the nitrate might replace fuming, it does not alter the fact of Marlow's earlier publication.

Then, again, he is stated, in 1876–7, to have improved the collodio-bromide process and prepared an emulsion as quick as wet plates. About that date he certainly published a formula brimful of fanciful variations, most of which, if not direct complications, were at least of doubtful value. But the essential features of the process to which it owed any qualities of rapidity it might possess had all been published previously by his countryman, Carey Lea, and others; and as a process his formula proved a dead failure on this side of the water.

Next, he is stated to have suggested the use of the fixed alkalies in place of ammonia in development; but here, again, Major Russell, in the early "sixties," and later, about 1867, the late Thomas Sutton had forestalled him by at least ten years. Finally, he is said to have "advised the use of yellow prussiate of potash in the developer, and the single solution iodide of mercury intensified for gelatine plates." The first of these was introduced by A. L. Henderson in 1879, and the second by B. J. Edwards about the same time, a period at which gelatine plates could scarcely be said to have established a footing in America. If, later on, the Society of Amateur Photographers of New York, on Mr. Newton's advice, included ferro-prussiate of potash in their "Standard" developing formula, as I believe was the case, it does not deprive Mr. A. L. Henderson of the original credit of its introduction, and the same remark applies to the mercurial intensifier.

I repeat I should be loth to attempt to deprive a deceased experimentalist of any credit due to him; but I do not believe that, in this instance, Mr. Newton would have laid claim in any one case to being the introducer of any of the novelties mentioned. The paragraph is only a glaring instance of the want of care exhibited by well-meaning individuals in their endeavour to say the most they can for a dead friend.

DOGBERRY.

UNDER WHAT CONDITIONS ARE SILVER PRINTS LIABLE TO FADE?

[Society of Amateur Photographers of New York.]

PHOTOGRAPHIC printing made a step backward by readopting the "combined bath." The past history of this objectionable method was such as to guard anybody against its reintroduction. The combined-bath method is undoubtedly very attractive to the confiding user of it. It is simple and quick, and can be used with advantage whenever the lasting qualities of the prints made by it have not to be taken into consideration. The danger lies, not in the method itself, as long as those who use it know what they can expect in regard to permanent results. No, the harm has been done specially by those who should have made every possible effort to tell the truth in this matter. Manufacturers of photographic papers, by recklessly or ignorantly recommending combined baths with their products, have aided very much to give their own articles of manufacture a very bad reputation for fickleness. If albumen paper has still many faithful followers, this is mostly due to the fact that this paper at least has not been abused and tortured with combined baths.

Many have been the discussions on this subject, but I am glad to state that now there is a decided change of opinion in favour of separate baths. However, we meet often with very contradictory assertions yet. Most of the combined-bath advocates will tell you that most of the combined baths are not reliable, but that they have their own formula on which you can safely depend. As proof they will show you prints which have kept well for years. They will explain all the failures by exhausted baths, wrong temperature, imperfect washing, impure chemicals, &c. Let me say right here that such assertions are merely based on illusions. If some combined-bath prints have kept well, this in itself is not a proof of permanency. It is merely a proof that they have not faded, and this may have been due to the fact that they have not been subjected to such strong influences as to change them. In other terms, the question is not, "Will this or that print fade?" but "Are they liable to fade, and in how far are they liable to do so?"

In the actual condition of affairs a photographer turns out every day a certain number of prints, and has to rely on his own guessing or on hearsay when it comes to the question of the permanency of his products.

There was a time when bridges, buildings, and machinery were constructed without much accurate knowledge of the resisting strength of material. Each undertaking of the kind was an experiment in itself. The builder was taking the alternative of either wasting material by making his construction unnecessarily heavy, or of finding afterwards that the results of his work were unsatisfactory in regard to strength.

Modern industry is no longer satisfied with this, and wants more accurate information. Modern engineers have their materials carefully tested, chemically and physically, and this enables them to obtain the most reliable results in the most favourable conditions.

In the manufacture of guns, armour plates, bicycles, &c., testing has become an important factor, and has helped enormously to develop and perfect these industries. Bicycle-manufacturers, for instance, do not decide on the quality of their machines by idle words, but by substantial tests. They do not admit, as proof that a machine of inferior make is as good as one of their own, the fact that one has lasted as long as the other, because neither of them may have been subjected to work serious enough to decide the question of quality.

Why should not the same methods be adopted in determining how far photographic prints are liable to fade? Let us see now what are the most appropriate tests which will give us an idea of the relative permanency of silver prints. A popular test among photographers is to subject the print to the action of strong sunlight for several days. If there is no change in colour, this is considered a proof of permanency. This test is very incomplete and superficial, and has led to many errors. I have seen combined-bath prints behave very well in sunlight, yet they faded badly when kept in an album or in a closed box. Furthermore, it is a known fact that pure, uncoated paper, bearing neither image nor silver emulsion, will turn in colour when subjected to the action of sunlight. The most expensive and best white paper, such as that used for platinum or bromide paper, will change in colour if submitted to sunlight during a few days.

Baryta-coated papers will change just as quickly under the same conditions, and, as they are always slightly tinted pink or *pensé*, their tint will be somewhat greenish. I have seen some of such papers change after one hour's exposure to the sun. By the results of such tests which I show you here, you can judge yourselves as to the extent of the change in colour. You will notice that some kinds of writing-papers, and particularly newspapers, become dark yellow when exposed to the sun for several days. These changes in the tint of the paper should not be mistaken for the fading of the print. The latter is caused by a thorough transformation of the silver image under the influence of chemical agencies. In order to study the cause of such fading, let us examine briefly the nature of the silver print itself, and let us enumerate what are the possible influences that can affect it. The early chemists classed silver together with gold and platinum amongst the noble metals, in opposition to the non-noble or base metals, which are lead, copper, iron, nickel, zinc, &c. This distinction was chiefly based on the fact that noble metals withstand direct oxidation, and that most of the chemicals have little or no action on them, while base metals are easily oxidised and affected by most chemical agents. Gold and platinum will not be affected by any of the regular constituents of the atmosphere, and that is the reason why these two metals remain perfectly bright and untarnished. More than that, it is well known that gold coins which have been kept

under favourable conditions for thousands of years have retained all their lustre. Silver would behave just as well as gold and platinum, were it not for the fact that it has a great affinity for sulphur, and will combine readily with this latter element whenever it has a chance, and this is the reason why silver is liable to tarnish. The slightest trace of hydrogen-sulphide (sulphuretted hydrogen) in the air will cover it very soon with a very thin, yellowish film of silver sulphide, which will become brown, then finally turn black. Here is a bright silver dollar piece, and you observe that, as soon as I bring it into this bottle in which I have produced some hydrogen sulphide, it becomes covered with a black deposit of sulphide of silver. DR. LEO BAEKELAND.

(*To be continued.*)

PHOTOGRAVURE.

BEFORE the Brixton and Clapham Camera Club, on January 21, a demonstration of Photogravure was given by Mr. A. Ernest Smith (Ealing P. S.), chief of the Autotype Company's Photogravure department, and winner of the Society of Arts prize for Photogravure. The demonstration attracted a very large attendance to the meeting, the chair being taken at eight o'clock by Mr. W. Thomas (Vice-President). The following is Mr. Smith's description of the process :—

"Before commencing my demonstration of Photogravure this evening, I must at once say that to tell you all I should like to on the subject would take me quite six such evenings. The time allotted me for this demonstration is barely sufficient to give you an outline of the process. I shall endeavour to make it as interesting as I can. When I gave my demonstration on photogravure before the Ealing P.S. I spoke of the negative, the positive, plate, resist, &c., under their different heads, and answered questions on each head before I proceeded with the next. By this means I managed to make myself pretty clearly understood, and we had quite a chatty and interesting evening. I shall therefore be glad if you will ask any question relating to the various headings as I proceed, and I will do my best to answer you. Then we can go on to the next heading. I have come over from Ealing to try and interest you, and, if possible, to help any of you here who may have already dabbled in the process. I shall, from time to time, hand you round the various articles used in the process of photogravure, many of which will explain themselves, and give you a far better insight of the process than any amount of talking. So much for preface, and now to business.

NEGATIVE.

Like most other photographic processes in photogravure, you want, to begin with, a good negative if you wish to obtain the very best result. These negatives handed round to you have all had photogravures made from them, and will show you the quality required perhaps better than I can tell you. I may say, commercially, we have to get used to making photogravures from all sorts and conditions of negatives, both amateurs, and professionals, (some of them very queer ones). A negative that will yield a good, soft, albumenised, silver print is the very thing for photogravure, at least so I have found, and I have worked photogravure processes for the Autotype Company, or been directly connected with them, for ten years. I may say here that I am an engraver, and I always, in reproducing a painting, work from an engraver's point of view, and not a photographer's. I have here the negative which I took at South Kensington, of Mulready's picture, *Choosing the Wedding Gown*. I tried various plates, but finally got this result on an Autotype plate, which was one of a batch specially made for me, and it was this negative which helped so much towards getting the photogravure with which I carried off the Society of Arts medal. I will not pass it round, but you can see it afterwards.

When you have got a suitable negative, take out any transparent spots and do any necessary retouching to it. Place a *safe edge* round the subject, either of orange paper or Bates' black varnish, as you see on the negatives handed round. When this is done, we can proceed with the transparency.

TRANSPARENCY.

The next step is to obtain a positive or transparency. I prefer the carbon transparency for all-round work; and, as most negatives are taken direct (*i.e.*, without the use of a mirror), a carbon transparency brings the image on the glass the right way about, I mean as regards right and left. For this process the film side of the transparency should be reversed as compared with the original, or just as it is in the negative. The transparency may be made so reversed on a dry plate in the camera or by contact on a stripping plate, but the carbon transparency does away with a lot of unnecessary bother. I will now hand round a few transparencies which have been used for photogravure. I see from your programme that Mr. Archer gave you a demonstration in carbon printing recently. I am heartily obliged to him, for by so doing he has somewhat paved the way for me, as I have very little time to spend on this part of the subject. To obtain a carbon transparency, you take a piece of the Autotype Company's transparency tissue, and expose it behind a negative to daylight, in a strong printing frame, for the requisite time. The exposure is judged by the use of an actinometer. This one I have used for years (a Johnson's). Experience will teach you just how many tints to expose it. If you have already used your negative in carbon printing and know just how many tints you gave it to get your paper print, all you have to do is to give it three times as much, or perhaps a little more, and you will not be far from the mark. It must be understood that this picture on glass is to be viewed by transmitted light and not by reflected light, hence the much longer exposure. When the tissue has been exposed sufficiently, it is taken out of the printing frame and placed in clean cold water, together with the glass on which it is to be developed (this glass having already been coated with bichromated gelatine and rendered insoluble by exposure to light). When the tissue has uncurled itself outwards and shows a tendency to lie flat, bring it (don't wait too long) into contact, under water, with the *coated* side of the glass plate, lift out carefully on to any flat surface, and squeegee the tissue firmly on to the glass. It is then laid on one side, either reared up on one end after getting rid of the superfluous water, or laid between bibulous boards or blotting-paper for, say, ten minutes (half an hour won't hurt it). It is then placed in hottish water, stripped of its paper support and developed just as you would a paper print, by laving it with the hand or rocking it about in a small bath. After the soluble gelatine has been got rid of, it is laid in clear cold water to set and afterwards put on one side to dry. A safe edge is then put round the transparency, as in the negative, and we are ready for printing the resist. A transparency that is too flat may be improved by soaking a few minutes in a very dilute solution of permanganate of potassium, this having a straining action on the film which improves the transparency to an extent greater than is indicated by appearances.

RESIST.

The *resist* is the technical term given to the gelatine *negative* film which we have to develop on the copper plate and through which we are to etch. This is best obtained by exposing a piece of either of the Autotype Company's etching tissues behind the carbon transparency already made, for the required number of tints on the actinometer. The transparencies handed round have a note of the various tints they require on their margins. Before taking the etching tissue out of the printing frame, it is as well to mark the back just to show in what position to place it on the copper plate.

COPPER PLATE.

Now about the copper plate. I have here a piece of copper which is a fair sample; it is fairly hard, and I think you can get capital quality for photogravure at about 2*s.* to 2*s.* 6*d.* per lb. It should be well polished; either up and down the plate, or, in what is termed, the circular fashion. It must be free from scratches and holes, as these would hold ink and damage the lights of the picture. A great deal has been said about the quality of the copper, and a great deal of blame laid at its door of which I am sure it is perfectly innocent. Something has to bear the blame; sometimes it is the copper, at other times the tissue, then the negative is not suitable, &c. It is *never* the operator who is in fault. When you have your copper plate, the first thing to do is to clean it. Free it from grease and tarnish. To do this, make up a paste of finely washed whiting and water, and add a few drops of ammonia to it. Some of this paste is taken on a tuft of cotton-wool, and rubbed over the plate in *a circular manner*. This may have to be repeated if the plate is very dirty. If the surface of the plate repels the water, you may rest assured it is still greasy. When the water clings to the plate all over, it will do, there is not much grease left. Then take off any tarnish with very dilute nitric acid, wash in water, and dry with a *clean* rag. The plate is then ready to receive the grain.

GRAINING THE PLATE.

We will suppose that a copper plate about 7 × 5 requires graining. A wooden box about 18 inches cube is a good size for that plate, or, say, 18 inches wide, 24 inches long, and 18 inches deep. The box should always be much larger than the plate to be dusted, to ensure an even layer of dust. Into a box of, say, 18 inches cube, I should put ½ to ¾ lb. of finely powdered bitumen. This can be procured already ground. In lump it is black, like pitch; but, when powdered, it is brown in colour, and, when *very* finely powdered, it has quite the colour and appearance of snuff. I generally give the powdered bitumen as bought an extra rub in a mortar, and always judge of its fineness by its colour.

Small boxes are shaken up in the hands to create a perfect smother of dust inside. Large boxes are revolved after the manner of a churn, and some very large ones have an arrangement for blowing up the dust from the bottom, whilst the box is stationary. The method of graining is as follows: The drawer is taken out of the box, and the plate to be grained is laid upon it within easy reach. The lid is put into its place, and the box is then shaken up well, say, eight or ten times, resting occasionally to give it a tap on the top and sides. (In the larger boxes which revolve you keep tapping them all round as it is slowly revolving.) This keeps the dust from clinging to the sides. After a good shake up, the box is placed on the table, and a sharp rap or two given to the top to remove any lumps that may have collected there. When this is done, rest for, say, forty-five seconds or a minute to allow the larger particles of dust to fall, and insert the drawer on which your plate is lying. Let it stay in the box, say, three minutes. At the end of that time take it out carefully, and *fix* the grain to the plate by heating it over a Bunsen burner until the brown dust changes to a "bluish" bloom all over the plate. Do not over-heat the plate, or you will have what is equivalent to a coarse, open grain. If you do not heat the plate sufficiently, I need hardly say the dust could be wiped off when cool. Some subjects require a very fine grain, others quite coarse. After a little practice you will soon be able to make up your mind as to quantity of dust. The grained plate I am handing you round has a good medium dust on it, and, if you will hold it horizontally from you towards the light, you will see the bloom over the surface. I need hardly tell you that, if you want a finer grain, you have only to make a longer rest, after shaking up the box and before putting in the plate. If you want it coarse, put the plate in as quickly as possible after it has come to a standstill, and let it remain three and a half minutes. This will give you a grain that will allow you to etch for thirty minutes without its being bitten away. The question I have often had put me is, Why need the plate be grained? I have a little plate and proof here that will speak pretty well for itself. The plate you see has been filled in with ink, and wiped off ready for printing. You will see that the ink wipes out on the ungrained side, whilst on the other it is held in its various depths by the grain. It is the bitumen dust fixed firmly on the surface which resists the etching fluids, and so, by breaking up the surface of the etched portions, gives us what we call its ink-holding property. Some workers of the process prefer resin to grain their plates with, whilst others use a mixture of resin and bitumen.

Developing the Resist.

The plate is now ready for the resist, which I have already mentioned. This is developed on the plate in exactly the same manner as the transparency was developed on the glass. The plate and tissue are laid in clean cold water until the tissue begins to uncurl itself; it is then brought into contact under water with the plate, taking care to get it as square as possible, which you can judge by the marks on the back of the tissue. The plate, with the tissue, is then lifted out and squeegeed together, not too roughly, or the grain may damage the resist and cause trouble afterwards. Rest the plate up to rest for, say, ten minutes after blotting off most of the water. It is a good plan to fan it at this stage, and helps it a great deal. It must not be warmed, but kept as cool as possible. Take the plate after its ten minutes' rest and lay it in hot water (about 100° Fahr.) until the colour begins to ooze out round the edges, lift off the paper support, and develop until all the soluble gelatine is washed away. Make sure of this by leaving it in hotter water for five minutes or so after it is apparently developed, then take it out and lay it in cold water for a minute to set. Rinse it under the cold water tap and rear it up to dry, letting the lower end rest on some clean blotting-paper. When the resist is quite dry, the copper margin and back are protected with Brunswick black or Bates' black varnish, and the plate is ready for etching. The straight edge round the subject is first got with a ruling pen charged with Bates' varnish, the margin is then carefully covered with a brush. Any transparent specks of copper showing through the resist must be carefully spotted out with the black varnish, or a deep hole will be etched in the plate, and, if this occurs in a face or sky, the plate will be ruined.

Making up the Baths.

The baths used for etching through the resist are different strengths of perchloride of iron. To prepare them, get a quantity of perchloride of iron, and add about one-third of its bulk of water, or even less, and stir up well, so as to dissolve as much perchlorides as possible. Pour some of the liquid obtained into a testing glass, and test its strength with a Beaumé's hydrometer. You will probably find that the liquid registers 45° to 47° Beaumé. You will then be able to mix up the different baths as follows:—

No. 1	43° Beaumé.
No. 2	40° ,,
No. 3	38° ,,
No. 4	36° ,,
No. 5	34° ,,
No. 6	32° ,,
No. 7	30° ,,

The baths must not have too much free acid in them, or blemishes are likely to arise in the etching. A little hydrate of iron placed in each bottle of solution takes up some of this acid, and makes the baths work much better. This is a trouble to make, so I should advise you to buy t. These two plates will show you some of the defects got in etching; one I call stars—they also go under the appropriate name of "devils"—and the other "pite."

Etching.

Now, as to the method of etching. You begin first with the strong bath; pour gently over the plate, and avoid air bells. This bath, if it etches at all, will confine itself to the extreme shadows, which are represented on the plate now as almost clean copper. If this bath will not start etching, the resist is slightly over-printed, so try the next (40° Beaumé). Let the extreme blacks of the picture have a bite of two minutes. Then pour off, and go on with the next bath (38° Beaumé), which will etch the next tones, then to 36°, and so on until the etching is finished. This should be completed in from seven to ten minutes for a subject similar to this. Practice and long experience alone can tell you just how long to allow the different baths to remain on the plate, but the rule is to "keep the pot a-boiling." If there is a great tendency for the etching to stick at any of the tones, drop at once to the next bath. This is the most important part of the whole process, and requires a great amount of judgment, which seems to come naturally to you after a long experience. When the etching is completed, the plate is placed at once under the tap and the resist rubbed off. A little whiting and ammonia is then rubbed over the plate to check any further action of the perchloride, and the plate is then cleaned up ready for printing. The black varnish is taken off with turps, and the bitumen grain dissolved off with benzole. The plate is cut square with a circular saw, its margins bevelled with a file, and burnished with charcoal and oil.

For *printing*, the plate is filled in with ink with a cloth dabber, and wiped with canvas; a roller press is used, and considerable pressure applied. For retouching, any slight defects in the plate are used: the roulette (about six to the set), a tool carrying a small wheel with one or more rows of fine points, the point, and the scraper, bayonet-shaped, and mostly used for removing any slight obstructions.

Plates from which a large number of prints are wanted have their surfaces coated with a deposit of iron by electrolysis—the "steel facing."

A. Ernest Smith.

WINTER PHOTOGRAPHY.*

Coming now to the region of practical photography at moderately low temperatures, the well-known scientific photographer, Captain Abney, has something of interest to say.

In an article in *Photography* for April 18, 1895, Captain Abney, after referring to the work of Professor Dewar, says: "The writer has, however, taken up his original investigations of the amount of chemical action which takes place in those temperatures in which the photographer may be called upon to work, such as that of this last early spring, and of a hot summer, these temperatures not falling especially into the work which Professor Dewar has set himself to carry out. The main facts brought out by time and intensity exposures at these more moderate temperatures seem to be these: first, that plates vary in sensitiveness when exposed at a high temperature and at an ordinary low temperature. A slow plate seems to vary more than a quick one, thus a slow lantern plate seems to require about $2\frac{8}{10}$ times the exposures at 0° F. that it does at 100° F., whilst a very rapid plate only requires about $1\frac{6}{10}$ times, that is, the latter plate is about $\frac{1}{3}$ better than a slow plate. The difference of exposure required between a lantern plate exposed at about 50° F. and 100° F. seems to be about half as much again. This may not be a serious matter for the landscape photographer, as it is probable that there is such a latitude in his plates that it would allow this difference in time to pass almost unnoticed."

The above opinions and results of experiments, as before mentioned, agree with my limited experience, that the effect of temperature on the sensitiveness of fairly rapid plates may in practical working be disregarded, especially if one considers how very few photographers can be

* Concluded from page 73.

certain of correct, or so-called correct exposures, when it becomes a question of fractions of a second.

Practically, then, exposure depends on the light present, the same as at any other time of the year, and must vary somewhat with the amount of contrast in the subject. I find that from one and a half times up to double the exposure that would be given to the same view in summer time will be ample, and I invariably treat a plate exposed on a bright winter subject as being over-exposed.

To my mind a much more serious difficulty occurs when the photographer comes to develop his plates. This point will be presently considered.

At this stage, perhaps, a few words on the choice of subject may not be amiss, although I make no pretence to knowledge or ability in this direction. One thing, however, seems quite clear, and that is, that many a scene or subject, which would be quite commonplace, even with the cleverest handling, in summer time, may be found in winter to be well worth a photographer's best efforts. Of course, the question of point of view, selection of foreground, and amount of subject to be included remain, as at other times, a matter of individual taste. However, the treatment of snow or ice under bright sunshine presents some pitfalls, which may, perhaps, be indicated with advantage.

It will be found, under such conditions, to be almost impossible—with me it has been quite impossible—to correctly render large and comparatively flat areas of snow or ice surfaces if the camera be pointed either directly towards the light or in the opposite direction. In the first case, a line of the most brilliant sparkle or glitter will be presented, in contrast with other objects, such as the trunks of trees, &c., in deep shadow. To correctly render both becomes practically impossible.

In the case of the sun behind the camera, the flat surfaces seem to lose their snowy texture, and present a glaring white mass. This, however, may be somewhat improved by trampling a path through the snow, taking care to make the path curve or lead in a direction that will harmonise with the general idea of the subject.

On the whole, I think that the best rendering of such scenes will be obtained when the sun is more or less at right angles with the direction of the camera. With diffused light and in hazy weather, these difficulties almost disappear.

On the other hand, the treatment of rugged masses or piles of ice or snow in the foreground appears to afford greater latitude, and, in fact, may be perfectly rendered with the light coming in any direction.

To my mind, however, bright sunshine in front of the camera, which is such an obstacle with flat surfaces, becomes quite charming with rugged masses, lighting up their outlines brilliantly and giving them a very pronounced character. Whilst the foregoing remarks deal only with certain clearly defined winter subjects, it must not be forgotten that many other delightful wintry scenes may be met with, which will call for individual judgment and decision.

I think it will be conceded, by those who have given it a fair trial, that the development of plates during very cold weather is the most critical period in the production of a winter picture. Personally, I am quite satisfied that cold solutions, dishes, and atmosphere in the developing room are responsible for a great deal of the apparent slowness of plates, or supposed under-exposure than any previous action of low temperature.

It has been frequently pointed out, and is easy to demonstrate, the fact that a very cold solution will retard development. Now, this retarding action is a most undesirable one in the case of winter exposures, since under normal conditions the time of development has to be somewhat long in order to obtain the best results from an exposure on a subject having extremes of light and shade. This latter has been pointed out by Captain Abney, who long since published his method of developing exposures on Alpine scenery.

Before learning of his method of development, I had made numerous failures, and settled down to my own way of working; this, curiously, is exactly the opposite of what he finds best. If I remember rightly, he (and other workers too) recommend that a very thin image, full of all possible detail, be first coaxed out by means of a very weak and dilute developer—then follow with a normal solution to secure density. I, on the contrary, have succeeded best by applying a strong but very restrained solution until satisfied that the high lights were almost sufficiently dense, then washing and applying a very dilute developer until all detail was out. Probably Captain Abney's method is the most reliable, but in any case it will be noted that the time required to get a satisfactory result is longer than with almost any other subject. This fact introduces the human element, and one which, to my thinking, decides whether the result will be a success or not. It will be obvious that, unless the worker is carrying on his operations in a comfortable temperature, there will be a natural tendency to shorten or hasten development, which is fatal to good results with winter scenes.

Evidently, then, development should take place in a room thoroughly warmed, and, if the usual dark room does not permit of this being done, operations should be postponed until the evening, when either the dining-room or kitchen may be requisitioned. I have often worked in a room in which a bright fire was burning, by taking the precaution to screen off the direct rays of light and the reflections from the ceiling. It is, of course, wise to keep the developing dishes constantly covered, except during the brief intervals when the negative is lifted out for examination. I find that from 45° to 50° Fahr. is a suitable temperature for solutions. In order to maintain them fairly constant when compelled to work in a cold room, I generally use a large tray about half-full of tepid water, in which the developing dishes are placed; then, by adding a little hot water from time to time, from a jug kept handy, the temperature of the water in the large tray and the developing solutions can be kept up.

The precautions to be taken to prevent negatives from being frozen during washing and drying are self-evident, yet it may be mentioned that steps should be taken to avoid such an occurrence, as it would otherwise mean the utter ruin of a negative.

The next process, viz., that of printing winter scenes, is probably one that affords the largest scope for individual taste and opinion. I have tried a fairly large range of ordinary printing processes—in fact, all, I think, except carbon—and I am by no means disposed to agree with those who think that a black-and-white is essential for a correct rendering of winter scenes. Neither am I quite satisfied with my own attempts to secure a proper representation with sepia, platinum, or plain silver paper toned with gold to a purple or bluish colour, although I think the latter nearer to nature than the warmer colour. At the present moment I am inclined to think that a small amount of pure white high light and a good gradation of grey down to strong grey in the deepest shadow to be the most satisfactory. This appears to be difficult of attainment with platinum, except with thin negatives.

Ordinary bromide paper also presents the same difficulties, although in a lesser degree, as the blackness in the shadows may be much modified by a variation of exposure and development, also by alterations in the developing solution itself. I feel convinced that printing papers of different degrees of roughness may be used for different negatives with good results, but on this point I am not prepared to make any suggestion.

This concludes the purely photographic operations intended to be dealt with in this paper, yet the final stage of mounting and framing of such pictures as may be considered worthy is one that calls for the most careful consideration, as even at this point an otherwise charming picture may be killed. For my own part, I feel that no rule can be laid down, and that no shade or style of mount and frame will suit all subjects.

Finally, it is hoped that, if these remarks contain nothing of value, they will at least serve to elicit some useful ideas in the discussion.

G. F. Blackmore.

The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* Journal *useful and instructive.*

Commercial Printing (To Photographer).—A. G. W. says: "Referring to the question in your last week's issue, I beg to say a few words. I say that it is quite possible for any good printer to manage 80 frames and get off 200 prints on a bright day. I, myself, with the aid of another lad, aged seventeen, have done so day after day, and it seems to my idea that by the way in which our friend writes he is either an amateur or of a very weak intellect. I should very much like to correspond with my friend through the medium of your paper."

Acetylene.—G. H. Rodwell writes: "Surely you must have made a mistake when you say, in answer to E. W. B., on p. 73 in last week's Journal, that the amount of acetylene gas obtainable from one pound of calcium carbide should be nearer five hundred than five feet. Taking the reaction as follows:

$$C_2C_2 + 2OH_2 = C_2H_2 + C_2(HO)_2$$
$$(40+24) = (24+2)$$

therefore 64 grains C_2C_2 give 26 grains of C_2H_2. One pound, therefore, or 7000 grains, will give $\frac{26 \times 7000}{64}$ or 2844 grains of acetylene gas. The molecular volume of acetylene being $\boxed{\ |\ |\ }$ it follows that the specific gravity of the gas is 13, taking hydrogen as unity, and is thus slightly lighter than air (13 as to 14·4). Now, 44·4 cubic inches of the gas would weigh 13 grains; therefore the number of cubic inches in 2844 grains would be $\frac{2844 \times 44{\cdot}4}{13}$ or 9713 cubic inches, which gives 5·62 cubic feet as the theoretical maximum obtainable from one pound of calcium carbide, assuming the salt to be chemically pure. In the very excellent article on acetylene, which appeared in the Supplement to your Journal on January 3, Mr. Banks states that a Bray's 0000 burner burns half a foot per hour. My experience does not coincide with this. I have tried three of Bray's smaller burners, respectively numbered 0000, 00,000, and 000,000, and the amount of gas burnt by each are respectively 1¼, 1, and ⅔ feet per hour."

SITUATION IN CHICAGO.—"LILLIAN" says: "Could yon kindly give me any information as to how I should obtain a situation in Chicago as first-class retoucher? I have served my time in the best house in Dublin, and have been principal lady retoucher in same firm for past five years. Would it be better to write direct to some of the leading houses there? if so, would it be encroaching on your valuable space to give me their names? What salary do you think I could obtain?"—Possibly some of our readers may be able to help our fair inquirer.

Our Editorial Table.

INDOOR PHOTOGRAPHY AND FLASHLIGHT STUDIES OF CHILD SUBJECTS.

By BERTHA M. LOTHROP. Bradford: P. Lund & Co.

MISS LOTHROP'S booklet contains reproductions of about twenty-three indoor child studies, of a not particularly good or bad quality, photographically or artistically, although, no doubt, they might be considered pleasing to the feminine taste. The hints given as to the utilisation of the flashlight for this kind of photography are brief; but, as a whole, the booklet is an amateurish production, not the least misleading part of it being the title "Indoor Photography," with which it cannot be said to deal, except cursorily.

THE ELECTRO-PHOTO COMPANY'S SENSITISED ALBUMEN PAPER.

THIS Company, whose address is 30, Fleet-street, have sent us samples of an albumen paper they are just introducing. The paper, judging by the results we obtained on the sample pieces, is an excellent one, giving prints of an admirable "albumen" quality, and possessing all the desirable points of such a paper, such as freedom from blisters, evenness of toning, and a good surface.

THE COMBINATION MEMO-BOOK AND LETTER-CASE.

MESSRS. SHACKELL, EDWARDS, & Co., the well-known printing-ink makers, of Red Lion-passage, Fleet-street, E.C., evidently have a warm corner in their hearts for editors, who are called upon at all sorts of times and seasons to "make a note of" something or the other, for they have sent us one of their improved combination memorandum-books and letter-cases. This is a neat little memo-book, placed inside an elegant leather case, which holds letters, &c. Perhaps the nicest thing we can say of this memo-book is that, ere these lines catch the reader's eye, it will have proved very useful to us.

THE IMPERIAL FLASHLIGHT PLATES.

THE Imperial Dry Plate Company, Cricklewood, have recently sent us some of their newest plates called, not unhappily, the "Flashlight." They are marked with the remarkably high speed No. 342. Conceiving that plates with such an implied abnormal degree of speed should prove of especial service to professional photographers in dull weather, such as the inhabitants of the metropolis have lately experienced, we resolved to subject the plates to trial under conditions approximating to those obtaining in portrait studios. Accordingly our exposures were made in an ordinary room (to wit, the editorial office of our domestic abode), at four o'clock in the afternoon of one of the first days of this month. Employing the lens at an aperture of *f*-8, and giving exposures respectively of one and two seconds, we were surprised to find, on development with hydroquinone and carbonate of soda (the duration of development being ten minutes), that the longer-timed of the plates gave us, all things considered, extremely well-exposed negatives. Unquestionably the "Flashlight" plates are exceedingly fast, and would be found notably so in a properly lighted studio. It is difficult to estimate the increase in the speed of plates that has taken place in recent years; at any rate, we are quite safe in saying that, speaking from our own personal experience, we should not, under circumstances similar to those mentioned above, have looked, six or seven years ago, for the results we obtained on the Flashlight plates.

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—Tuesday, February 11, at eight p.m., Annual General Meeting. *The New Shadow Photography*, experimentally illustrated, by Mr. A. A. Campbell Swinton.

AN interesting and highly successful competition was lately started in connexion with *Little Folks* magazine. Prizes were offered for the best imaginative drawing of "The Editor of *Little Folks*," and some of the results, together with a portrait of the Editor (from a photograph—and quite as curious as any of the specimens sent in by competitors) will be reproduced in the February number of the magazine.

THE PHOTOGRAPHIC CLUB.—The Annual Lantern and Musical Entertainment (Ladies' Night), under the direction of Mr. F. A. Bridge, will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, February 12. Among the attractions will be an exhibition of pictures in his kinetic lantern by Mr. Birt Acres. Tickets may be obtained of Mr. Bridge, East Lodge, Dalston-lane.

NOT the least attractive feature of the *Minster Magazine* is a score or more types of beauty, specially drawn by leading black-and-white artists as their own ideals. Among the contributors to this interesting collection are Bernard Partridge, Dudley Hardy, Hal Hurst, L. Raven Hill, Lewis Baumer, Max Cowper, J. W. T. Manuel, Yorick, T. Walter Wilson, R.I., H. R. Millar, Gordon Craig, Sydney Adamson, Rob. Sauber, Fred Pegram, &c.

THE new system of photography has already received official recognition in Germany. The *Reichsanzeiger* publishes the following:—"The Ministry of War, in conjunction with the Imperial Institute of Physiology, has carried out experiments on the application of the Röntgen discovery to war surgery. A series of photographic impressions gave a clear picture of bone injuries, and permitted the position of an embedded projectile to be ascertained with precision. The experiments will be continued on a larger scale."

OPENING OF MR. SWEET'S NEW STUDIO AT ROTHESAY.—The premises in East Princes-street, Rothesay, reconstructed by Mr. Charles Sweet for the purposes of his business, were recently thrown open to public inspection. The whole of the ground floor is utilised as a show-room, with shop frontage to East Princes-street and Bishop-terrace Brae. Specimens of the firm's work are here on view, and in addition there are oil paintings of Provost Milloy, and coloured enlargements of General Macdonald, Mr. Graham Murray, M.P., and others. On the first flat there are five rooms, consisting of lady's dressing-room, gentleman's dressing-room, spare waiting-room, and workroom. These and the show-room are elaborately and artistically furnished and decorated, and on the walls are excellent reproductions of famous paintings by Tadema, Goodman, and Miss Thompson. The top flat forms a spacious operating gallery, with a dark-room and negative-room adjoining, fitted up with the most modern appliances for the successful prosecution of the photographic art. The studio has a north-west light, and the blinds—a most important feature in connexion with the manipulation of the light—are worked on the new carriage system. Cameras, backgrounds, accessories, and furniture are of the most up-to-date type; and the establishment, taken all over, is perhaps the most modern and best equipped on the West Coast. The general arrangement and the skilful manner in which every available inch of space is utilised reflect great credit on the architect, Mr. A. M. Mackinlay.

THE X RAYS.—"German men of science," says the *Standard*, "are now busy investigating the nature of the rays discovered by Professor Röntgen, and, among other things, are searching for means of shortening the long interval of exposure at present required to procure the new photographs. Professor Gieseler, of Bonn, has been experimenting with the view to utilising the fluorescent effects of Röntgen's rays to this end. He smeared a piece of paper with various substances, laid it on the dry plate, and exposed it to the rays. He has already found that chloride of iron, nitrate of uranium, and extract of cuba wood have the desired effect. He then steeped the dry plate itself in chloride of iron, and thus succeeded in further abbreviating the process. Systematic experimenting in this manner, he thinks, will be the best way of finding the fittest substances for expediting the process. Professor Gieseler also points out that ordinary rays are just as little broken by the eyes of insects as are Röntgen's rays in the new photography, and he suggests that, as the eyes of insects can very easily be artificially imitated, such imitations may, perhaps, prove of use in the production of sharper outlines in the objects photographed by the new rays. A member of the Photographic Club at Crefeld has found that the time of exposure is shortened exactly by one-half by heating the plate. He heated it up to about 40° Cent. (or a 104° Fahr.), and the process then occupies only fifteen instead of thirty minutes. This effect, it is conjectured, is probably due to the enhancement of the fluorescence by heating, and cannot fail to be of great use in the case of small apparatus. Professor Goldstein, of the Royal Observatory here, in a recent lecture on cathode rays and Röntgen rays, pointed out that cosmic physics have already obtained very valuable new results by the study of the former. Some of the results of observations of the sun's surface, which were a mystery before, are now explained by the discovery of the fact that the cathode rays propagate electricity from body to body in certain external circumstances under which such propagation does not otherwise take place. He has also proved by experiments that, when these rays strike a second cathode, they are repelled by it. The fact that Röntgen's rays are not deflected by magnets is adduced by Röntgen as a proof that his rays are quite new. Professor Goldstein, however, objects that there are cathode rays which are likewise not influenced by magnets. The main characteristic of Röntgen's rays, viz, the power of penetrating bodies which are impermeable to ordinary rays, is also shared by several other kinds of rays. M. Raoul Pictet, for example, has proved that rays emanating from very cold bodies penetrate all media, including even layers of wadding up to two metres in thickness. It is also known that ultra-violet rays penetrate plates of vulcanite and thin layers of silver, which common light does not penetrate. In this connexion, Goldstein referred to the observations made by Dr. Cornil, a Paris physician, to the effect that patients who have successfully undergone the operation for cataract can see ultra-violet rays which are invisible to others. According to Professor Goldstein, the common characteristics of cathode rays and Röntgen's rays are rectilinear propagation, the production of shadow photographs, and chemical action. The species of rays to which Röntgen's belong, he thinks, cannot yet be determined, but that there are many grounds for believing that they belong to the cathode species."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

February.	Name of Society.	Subject.
10	Ireland	Opening of Exhibition.
10	Richmond	*A Chat on Photographic Chemicals.* G. Ardaseer.
11	Birmingham Photo. Society	Demonstration upon Lantern-slide Making. Hall Edwards, L.R.C.P.
11	Brixton and Clapham	*The Troubles of a Tourist.* R. G. F. Kidson.
11	East London	*Carbon Printing.* Autotype Company.
11	Hackney	Open Night.
11-15	Ireland	Annual Exhibition.
11	Royal Photographic Society	Annual General Meeting.—*The New Shadow Photography.* A. A. Campbell Swinton.
12	Ashton-under-Lyne	Lantern Exhibition: *A Visit to Ireland by Four Members of the Society.*
12	Borough Polytechnic	Bromide Printing by Members.
12	Croydon Camera Club	Sixth Annual Meeting.
12	Leytonstone	*The Evolution of the Eye in relation to Photography.* A. T. Cuffey.
12	Photographic Club	Annual Lantern and Musical Entertainment.
12	Southport	Developing Competition.
13	Bradford	*Photography and Fine Art.* W. Howgate.
13	Leeds Camera Club	*The Chemistry of Photography.*—III. Printing Papers. Dr. J. T. Thresh.
13	Leigh	*Photographic Chemicals.* W. Hampson, M.P.S.
13	Liverpool Amateur	Auction of Photographic Goods, the Property of Members.
13	London and Provincial	*Enlarging* (with Demonstration). J. E. and R. A. Hodd.
13	Oldham	Enlarging. The Members.
13	Woolwich Photo. Society	*Printing and Finishing.* H. J. Dalby.
14	Birkenhead Photo. Assc.	Photo Notes by many Members.
14	Bournemouth	*Carbon Work.* H. M. Roberts.
14	Croydon Microscopical	Trial Night for Members' Slides.
14	Darwen	*Wanderings with a Camera.* Alfred Read.
14	West London	Discussion on Beginner's Difficulties.
15	Borough Polytechnic	Demonstration by Autocopyist Company.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 30,—Mr. E. Bayston in the chair.

COLOUR OF NEGATIVES.

The discussion of the evening centered on the following question, taken from the box: "What is the influence of the colour of the negative?" It was presumed in the present case to refer to printing.

Mr. BIRT ACRES thought a yellowish negative would give a better result than one of a blue tint. He said he had once published a process for correcting the harshness of negatives, in which he stained the gelatine film itself and not the varnish, as generally done. The stain was effective only where no reduced silver was present in the film, and no action took place where the silver was reduced. It possessed the advantage over stained varnish, which covered the whole of the image, in that it only affected the gelatine. He mentioned that it was known that gelatine combined with silver, and would not take stain.

Mr. R. BECKETT said it had often been recommended to stain a negative developed with an agent giving a blue negative with pyro, when a better printing negative was obtained.

Mr. A. MACKIE considered the colour of the negative had some influence, and referred to the effect of a green glass in printing. He said, however, that the colour of the deposit and the colour of the stain were two very different things.

Mr. W. D. WELFORD asked if anybody would undertake to produce a negative by such agents as amidol, metol, &c., which give a blue image, with a given exposure, equal in printing quality to one developed with pyro and soda, and offered to produce a negative in yellow giving a harder print than could be got from a blue negative. The conditions were that the plates should receive a normal exposure, and that the prints, by which the contest would be decided, were to be in some process tending to hardness, such as gelatino-chloride. He also undertook to get a print from the blue negative equal to that from the yellow, if stained.

The HON. SECRETARY offered to expose two plates under like conditions and hand half of each to both competitors, and Mr. Smith accepted the challenge. The Hon. Secretary drew attention to an article by Liesegang on the relation of the tanning action in development to staining of the film and the alteration of the printing quality of the negative. He also mentioned some experiments by the same author bearing on the relief of the image produced by some developers, in which one corner of a dry plate was dipped in a ten per cent. hypo solution and another in plain water for a similar time, the gelatine in both cases swelling to the same height. The whole was subsequently immersed in water and dried, when that portion dipped in hypo remained higher than the rest.

With reference to the use of sulphite, Mr. MACKIE had for a long time mixed it with both the ammonia and the pyro; but the HON. SECRETARY preferred to keep all the solutions distinct, and always used the same quantity of sulphite with varying quantities of developer.

Touching the addition of hypo to amidol as accelerator, the HON. SECRETARY thought it was merely adding fog to the negative, and Mr. WELFORD said one had no means of regulating its action and no control whatever.

Mr. SMITH said it had been stated that the time of adding the hypo made a difference. It should not be added till after the image has appeared.

PHOTOGRAPHIC CLUB.

JANUARY 29,—Mr. Walter D. Welford in the chair.

Mr. George Hare very kindly presented to the Club the model of a camera front made thirty years since, and which Mr. Foxlee had shown at a previous meeting. This contained the principle of a newly patented camera which had been recently shown to the members, and for which claims of originality had been made and contested by certain members. A vote of thanks was passed to Mr. Hare for his kindness, and the model was added to the Club museum.

The Judges of the Watkins developing competition presented a written report, which will be published *in extenso* by the courtesy of the photographic press, and they were thanked by the meeting for the trouble they had taken.

Mr. HAROLD BAKER, of Birmingham, then gave his lantern lecture upon

THE AVON VALLEY.

In an interesting manner Mr. Baker eulogised the valley of the Avon, of which he succinctly stated that it was difficult to know where to begin to reproduce its beauties, and impossible to know where to leave off. In a facile manner, and with charming illustrations upon the screen, Mr. Baker took his audience through some of the most characteristic scenery. With typical examples of churches, mansions, river views, half-timbered cottages, partly hidden by plum-trees in blossom, interesting archæological details, plans of old abbeys, sketches of fifteenth-century armour, tracings of memorial brasses, and appropriate recitations from Tennyson and Milton. With these, and an easy flow of carefully prepared literary matter, the evening passed only too quickly.

At the close, Mr. FRANK HAES said that the Club had had an exceedingly great treat, and that he, knowing the district, felt sure that he had enjoyed the admirable lecture as well as any. He recommended the district to photographers who desire to make pictures, and asked for a very hearty vote of thanks for Mr. Baker.

Mr. F. A. BRIDGE seconded the resolution, and the meeting passed the vote by acclamation.

Mr. BAKER suitably responded, and said that he had already spent his spare time during the last three years upon the work, and that he hoped to add to his collection.

Mr. SNOWDEN WARD then showed a few of the new

RÖNTGEN SILHOUETTES,

which were of considerable interest. He pointed out that in places where metal discs had been used to stop the X rays, there were overlapping circles of halation, which he believed to be due to induced electrical action between the pieces of metal; in proof of this he showed one negative in which what clearly appeared to be sparks were represented as passing between two pieces of metal laid upon the outside of the slide in the customary way in which these photographs are obtained. The sparkings looked almost exactly like photographs of lightning.

Mr. BRIDGE stated that Mr. Child Bayley had promised to show at an early date at the Photographic Club some of Mr. Gifford's results, and also the outcome of some experiments which he himself was making.

Mr. R. P. DRAGE then drew attention to the fact that this was the last meeting at which Mr. James A. Sinclair would be present in his official capacity as Hon. Secretary of the Photographic Club. Mr. Drage made a few kindly remarks referring to his (Mr. Sinclair's) great activity in the Club's interests, his courtesy to the members, and to the success which had attended his efforts to provide the Club with good photographic pabulum, and lastly to the improved attendance which had been the result of these efforts. He asked all the members present to unite in a very hearty vote of thanks to Mr. Sinclair.

The resolution was felt to require no formal seconding, every member present testifying his sincere admiration of the way in which Mr. Sinclair had carried out the duties of his office by hearty and spontaneous applause.

Mr. SINCLAIR modestly replied, and the meeting closed.

MANCHESTER PHOTOGRAPHIC SOCIETY.

JANUARY 22.—Mr. A. E. Casson introduced the subject of

STEREOSCOPY ON THE SCREEN.

Two lanterns are used, either side by side or a biunial, with lenses of as equal focus as possible. A stereoscopic transparency is cut, and one half placed in each lantern. Behind one is a piece of red glass; behind the other green glass. The two pictures are projected together on to the screen, the result being an indistinct mass of colour, caused by the two slides occupying the same place on the screen. The pictures are then looked at through coloured spectacles having red and green glasses, the result being that both pictures blend as one, and stand out in stereoscopic relief. After a description of the principles of stereoscopy by Mr. WHITEFIELD, these were put through the lanterns slides by Mr. Freshwater, of London, and the process did all that is claimed for it. Messrs. Newton & Co. are the publishers of slides and spectacles. This was followed by an exhibition of slides by R. W. Thomas & Co. on their lantern plates, from negatives taken on their anti-halation plates, embracing many of the cathedrals of England, including Winchester, Ely, St. Paul's, and Lincoln.

Brixton and Clapham Camera Club.—January 21, Mr. J. W. Coade (President) in the chair. A paper and demonstration of

ELEMENTARY PHOTO-MICROGRAPHY

was given by Mr. R. G. MASON, who went thoroughly into the subject, and enabled the members to have a most interesting meeting. He concluded by showing through the lantern a number of slides of microscopic objects, including a splendid series, *The Anatomy of a Honey Bee.* A member exhibited a slide of a hand taken by the "new photography" of Professor Röntgen. Mr. W. THOMAS explained how these photographs were obtained, and described experiments in the same direction by Mr. J. W. Gifford. It was decided to open, in the name of the Club, a subscription list in aid of the Traill Taylor Memorial.

Croydon Camera Club.—The Twenty-third Public Lantern Show at the Braithwaite Hall was held with even more than the usual *éclat*, the audience being so large as to necessitate space for a portion being found in the lecture-room attached to the hall. The Club was particularly fortunate in prevailing upon Mr. Ernest R. Ashton to exhibit and explain his matchless series of pictures,

IN EASTERN LANDS,

Although Mr. Ashton is the winner of no less than twenty medals awarded at the chief photographic exhibitions of the world, he has never been induced to show, let alone describe, his collection of pictures until he made his *début* at the above gathering. It is impossible to do full justice to the exceeding beauty of many of the scenes, nor to convey in words the numerous points of interest concerned with the Eastern people, their customs at home and at business, which Mr. Ashton's slides so vividly portrayed. Several of the mosque interiors, with their magnificently decorated "Mecca" shrines, are unique views, no other photographer having been able to obtain permission to photograph them. The heartiness with which the large audience accorded Mr. Ashton a vote of thanks, proposed by the President (Mr. H. Maclean, F.G.S.), showed how greatly the lecture and slides were appreciated. The second portion consisted of members' slides, which were, as usual, explained by the President. First came an admirable set of about two dozen views in South Devon, Honiton and the Teign district. These, on account of their fine tone, attractive subject, and skilful handling, were received with great favour. Mr. H. E. Holland, by whom they were shown, being warmly applauded. Next, Mr. MACLEAN explained some of his own productions. A small set of the floral *fête* at the Hastings Carnival recalled pleasant memories of a week given up to revelry. Another set of *Flowers at Kew* seemed greatly to the audience's taste, specially approved being a picture of an exotic from the land "where it is always afternoon." Messrs. J. and A. J. Noaks, Watson, Corland, Packham, Rogers, Myrtle, and Hirst also contributed. Finally, Mr. Isaac, who handled the lantern with admirable skill, showed a dozen of his own slides. It is hard to particularise where all were good, but perhaps to a telling rendition of *The Corbière Rocks, Jersey*, should be awarded the palm, although the President was inclined to give first place to *On the Mole: Early Morning*. At the conclusion of the members' slides, the PRESIDENT gave a brief but clear explanation of the mysterious X rays which Professor Röntgen has lately given such prominence to. He then showed and described a number of pictures, or shadowgraphs, taken by Mr. A. Campbell Swinton by means of the radiant matter aforesaid.

East London Photographic Society.—January 28, Mr. E. Stone in the chair.—A lecture on

COMPOSITION AND LIGHT AND SHADE

was given by Mr. EDWARD ATKINSON, illustrated by numerous diagrams and prints. He deprecated the taking of what was termed "pretty bits," as the interest attaching to them would soon pall. In photography a pleasing result depended greatly upon the lighting of the subject, but it was all too evident that a great many seemed to overlook or ignore this salient point. Each production should convey to the observer that some definite object had been sought after, and it should be the photographer's aim to express this in a manner befitting the subject in hand. The painter's power in being able to leave out irritating details was referred to, and the best means of suppressing them in photography was explained. The rules governing the elements of a picture were treated of, and a plea for a more rigid selection of subject was demanded, if it was desired that the art should be still further advanced. The apparent easiness of photography was one of its greatest curses! For a few pounds one could procure the necessary apparatus, and forthwith sally out and snap up everything that might please, ignoring all rules which, though flexible, govern the making of a picture. He did not wish to imply that the canons of art must be strictly adhered to, but they were a foundation, at least, upon which we could work. He instanced several pictures which contravened many recognised laws, but which were highly artistic pieces of work. The great difference which could be made in a subject possessing parallel or horizontal lines by simply altering the point of sight was illustrated by diagrams, and caused a certain amount of astonishment.

Hackney Photographic Society.—January 28, Mr. J. O. Grant presiding.—Excursions and other fixtures were arranged. In a discussion as to the best method of procedure for

SNOW PICTURES,

Mr. R. BECKETT said that the common fault was to get them either too hard or too flat. Snow scenes were best taken with sunshine. Captain Abney had advised developing with very small amount of pyro to get detail, and then getting density by means of intensification. Mr. RAWLINGS advised the use of slow plates, as they were more manageable. Messrs. GUEST and RAWLINGS respectively brought up results of experiments made to determine the question as to whether negatives lost density during long fixation. Mr. Rawlings' experiments served to show that no loss of density occurred by prolonged fixation, but considerable loss of colour. In two portions of a pyro-developed negative, the yellow stain was much less apparent in the portion which had been allowed to remain in the hypo bath considerably longer than the others.

North Middlesex Photographic Society.—January 27, Mr. Mummery (the President) in the chair.—Mr. ROLAND C. WHITING gave a lecture on

WHY WE FAIL?

He went very fully into the causes of failure and the way to get over them. He began by saying that the main cause of failure in picture-making was a want of retention of purpose. If you want to succeed, keep to one or two definite aims, instead of photographing anything that comes in your way. He dealt with faults of manipulation, such as want of cleanliness, light in the dark room not sufficiently non-actinic, &c. With regard to exposure, not sufficient attention was paid to the quality of the light, and the relative quantity of light and shade in the picture itself, which constituted a great source of failure. Photographers ought to try and get the effect of motion in their pictures. It was false economy not to buy the best apparatus, and plates with plenty of silver in them gave much the best results, and all plates are the better for being backed. Don't keep changing developers; keep to one, and always mix it accurately. Plates are not properly fixed the moment they are clear, and should not be brought to the light until some little time has elapsed after they appear fixed. He ended by saying that a high standard should be aimed at, even if it is not attained. After Messrs. GOODWIN, LENNANT, BEADLE, and others had put various questions, and Mr. Whiting had replied, Mr. JOHNSON proposed a hearty vote of thanks to the lecturer, and Mr. MATTOCKS seconded, which was carried unanimously.

Mr. CHILD BAYLEY brought up some results he had obtained, in conjunction with Mr. Gifford, of

PHOTOGRAPHY BY MEANS OF CROOKES' TUBES.

He showed photographs of his own hand and that of a lady in which the bones showed distinctly through the flesh. The plate was covered with a sheet of waxed paper, then the hand was placed upon it, and all wrapped up in a changing bag of black cloth lined with red, and the Crookes' tube, excited by a ten-inch spark induction coil, was held directly over it. No trace of the cloth appeared in the prints, showing that it was transparent to these rays. He also showed photographs of metal discs in a closed box upon which a sheet of aluminium had been placed, as this metal allowed the rays to pass through; also one taken through a thick porcelain dish, but this was under-exposed. A vote of thanks was accorded to Mr. Child Bayley for the interesting exhibit.

The annual dinner was announced to be held on March 14 at the Holborn Restaurant.

Leeds Camera Club.—January 30.—The Rev. J. BEANLAND gave a lecture and demonstration on

THE AFTER-TREATMENT OF PLATINOTYPE PRINTS,

being a supplementary course to his previous demonstration on Platinotype Printing, delivered before the same Club in March 1895. Mr. Beanland showed how comparative failures in printing could be turned into complete successes by careful after-manipulation, and also demonstrated his methods of producing numerous tones, including brown-black, blue-black, Vandyke, purple, sepia, green, and blue. For this after-treatment it is essential that the prints be thoroughly fixed in hydrochloric acid, after development, to remove the last trace of iron, otherwise unequal toning, or iron stains, are sure to occur. For various shades of Vandyke brown and red the demonstrator boils two drachms of Packham's tinctorial powder in five ounces of water for a few minutes, and, when cold, adds one ounce of alcohol, and makes up the solution to six ounces with water. Uranium nitrate gives very pleasing tones, but, when used with ammonium sulphocyanide (the usual method), the toning is very irregular, and decidedly fugitive. He therefore recommends one drachm each of ten per cent. solutions of uranium ferricyanide) of potassium and sodium sulphite, six ounces of water, and three drachms of acetic acid. If the result is not satisfactory, the original colour can be restored by the application of a weak solution of ammonia. A beautiful sea-green tone is obtained by immersion in a mercuric solution, followed by chloride of iron, and a blue image by the application of the ordinary ferrous-oxalate developer for a few moments. The results produced by Mr. Beanland during his demonstration were highly satisfactory, and his friendly advice much appreciated. On the suggestion of Mr. Vevers, a subscription to the Traill-Taylor Memorial was opened, and a considerable amount promised by members present.

Liverpool Amateur Photographic Association.—January 30, the President (Mr. J. Sirett Brown) in the chair.—Captain T. Lamb, Captain H. Pomeroy, and Messrs. C. E. Hancox, A. Von Heyder, Harold Coventry, and Francis H. Edwards were elected members. The PRESIDENT drew attention to the prospective engagements, especially to the auction on February 13, and to the engagement of the well-known lecturer, Mr. Eadweard Muybridge, for March 19 in the City Hall. The medals awarded in the recent competition were then presented to the winners. This concluded the business part of the meeting, after which Dr. J. W. Ellis was called upon to deliver his lecture entitled *The Black Mountains and Golden Valley; a Holiday in King Arthur's Country.*

Oxford Camera Club.—January 27.—A demonstration of the new

URANIUM INTENSIFIER

of the Cresco-Fylma Company was given by Mr. H. A. HOLLIDAY, one of the Secretaries. In the course of many experiments on the process, he had discovered some methods of working which gave a superior result to those recommended by the manufacturers. Thus, in order to get the greatest possible contrast, he much over-intensified the negative, and then placed it in a very weak solution of soda carbonate or ammonia. This, while reducing the picture as a whole, acted with most effect on the lighter portions, so increasing the contrasts. The intensifier seems to act mainly by changing the colour to a very non-actinic reddish brown, the printing time being much increased. The solution has no injurious action on the film, as is sometimes the case with mercury bichloride, and is practically non-poisonous. There is the further advantage that the whole intensification can be removed by alkalies if necessary, leaving the negative as at first. The lecturer also showed the toning of bromide prints, by the same solution, to a warm brown, which was very pleasing.

Plymouth Photographic Society.—January 24, Mr. E. H. Micklewood (Vice-President) in the chair.—Mr. STANNING (Hon. Treasurer) reported that the year's receipts amounted to nearly 11*l.*; and, after buying a lantern for the use of members, there was a debit balance of 17*s.* 8*d.* Mr. R. RUGG MONK (Hon. Secretary) reported that, twelve months ago, after taking counsel with friends, he called a meeting of all interested in the formation of a Photographic Society for Plymouth. Eighteen responded to the invitation, the Society was formed, and it now numbered fifty members. It was unwise to judge of vitality and genuine work by mere numbers, but, tested by the quality of the papers and demonstrations given, and the number of members attending, the result was excellent. The Society's Exhibition—albeit a private one—was well attended, and much interest was taken in it by members and their friends. It already afforded evidence of ability amongst the more modest members, and it

was hoped their Exhibition would this year be more pretentious, and be an open one. The summer photographic excursions were well attended and very enjoyable. It was hoped that members would continue to show a keen interest in the work of the Society, and, by widening its scope, by introducing new blood, and by offering to read papers, or to demonstrate, help forward the delightful art they were combined to promote. On the motion of Mr. J. HAYNE PILLAR, seconded by Mr. A. MOORE, the reports were adopted, the CHAIRMAN remarking that, whilst the Hon. Secretary had spoken in eulogy of his services, the Society was far more indebted to Mr. Monk. On the motion of Mr. DUNSTAN, seconded by Dr. BRENTON, Mr. Micklewood was by acclamation elected President: Mr. H. S. Hill and Mr. W. Aver Duncan were elected Vice-Presidents, Mr. R. Bowden declining the honour. Mr. Stanning and Mr. R. Rugg Monk were unanimously elected Hon. Treasurer and Hon. Secretary respectively. Replying to a vote of thanks to the officers, the Chairman said Mr. Monk was the father of the Society, and had by his ability and energy contributed largely to the success it undoubtedly was. A ballot resulted in the election of Mr. J. D. Turney, W. H. Harris, T. Algate, and J. H. Pillar as the Committee, and Mr. Johnson was elected the Auditor. An attractive programme for the session includes a platinotype demonstration and a lantern evening.

FORTHCOMING EXHIBITIONS.

1896.

February 27-29 ..... Woolwich Photographic Society.

March 2-6 ..... *South London Photographic Society. Hon. Secretary, Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.

" 3-6 ..... *Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

ALBUMEN PAPER.

To the EDITORS.

GENTLEMEN,—In a reference to albumen paper, on page 66 of your issue of January 31, you remark that it "certainly dies very hard."

I believe this is fully explained by the fact you state in the succeeding paragraph, namely, that "there are features in good albumen prints which compel admiration for the process, and are not always possessed by other methods of printing."

But the charge is brought against albumen prints that they are not permanent. In dealing with this subject in an American journal last month, Mr. W. H. Sherman describes a portrait of Bayard Taylor, taken in 1864 or 1865, as to which he remarks: "It is hardly possible that a print by any other process, whether carbon or platinotype, would have changed less in any respect than this photograph has changed in all these years."

In an article on the same theme in the *St. Louis and Canadian Photographer* (January), the writer points out that, with respect to prints that fade and turn yellow, "the compound toning bath, imperfect washing, and insufficient fixing are some of the causes to which this trouble is to be attributed;" and he proceeds: "Photographers would do well to pay more attention to the production of lasting prints, and we hear that several parties here in America are coming back to the use of albumen paper, and have even offered to reprint free of charge work given out these last two or three years. Mr. Backrach, in Baltimore, is one who deserves credit for taking this step in the interest of his reputation at no small sacrifice of money, and we think it is a step in the right direction."

In connexion with Wilson's *Photographic Magazine* the following question was put to its readers: "Do you practically find the new printing papers to give as satisfactory and permanent results as albumen paper?" and (of course, in addition to other replies expressing different opinions) the following were some of the answers received and printed in the December issue:—From James F. Ryder, Cleveland, Ohio, 'No, sir, not all kinds;' from F. G. Schumacher, Los Angeles, Cal., 'Were I to choose between aristo and albumen, I would prefer the latter;' from R. D. Beem, Greenville, Ohio, 'American aristo papers have proved permanent, the gelatine papers have not; but albumen paper gives better tones, has more depth and better harmony of tone than the ready-sensitised glacé papers;' from Charles Fritsch, Pittston, Pa., 'I have just gone back to old albumen;' from Arthur & Philbric, Detroit, Mich., 'Not as permanent as albumen prints;' from Henry Holler, Brooklyn, New York, 'Decidedly not.'"

I am inclined to think that a similar question put to photographers in this country would elicit the fact that albumen paper has not been given up to the extent that many suppose, and that, amongst those who have given other papers a trial, there is a tendency to return to the old favourite.—I am, yours, &c., W. T. A. B.

SUPPOSED MISPLACED HISTORY.

To the EDITORS.

GENTLEMEN,—Your correspondent, "Another Old Member," is very complimentary to some imaginary person (with which I have nothing to do), but he is very severe on me for, as he says, confounding Charles II. with James I.; in fact, he makes this accusation the only coherent part of his letter, for which I am far from blaming him. When one writer accuses another of a "feat of inaccuracy" and "an act to be condemned in an ordinary individual," I think the one condemned has a right (of which I joyfully avail myself) to demand chapter and verse. Therefore I ask "Another Old Member" to quote his history and prove me wrong. He says that the words which I applied to Charles II. belong to James I., and I am afraid he rather jeers at me for the supposed mistake; nevertheless, I am sorry to take the little flutter out of his sails by giving my references first and asking him to follow.

I thought it was known to everybody who can read and write that the words in question occur in the *Mock Epitaph on Charles II.*, written by the Earl of Rochester. Here it is:—

"Here lies our sovereign lord the King,
Whose word no man relies on;
Who never said a foolish thing,
And never did a wise one."

I won't stop to imagine how dreadfully ashamed of himself the erudite "Another Old Member" must feel as he reads this, and how, if he is wise, he makes a vow never to be cocksure any more; or, if otherwise, or other than wise, he is tearing through all the books within reach to try to discover who misled him in this exceedingly important matter. Perhaps my astonished friend is not yet convinced, and wants still more authority. Let him turn to Sir Walter Scott's *Tales of a Grandfather* (Scotland), chap. xlix. Speaking of the well-known lines he says: "The satirical epitaph written upon him (Charles II.) at his own request, by his witty favourite, the Earl of Rochester, is not more severe than just."

In my letter the words in italics only were applied to "Cosmos;" does "Another Old Member" say the other lines also apply? It is he who has compelled me to quote them.—I am, yours &c.,

AN OLD MEMBER.

P.S.—"Another Old Member" says nothing about the really serious part of my letter. He would have done better if he had backed me up in that £1000 a year matter.

PHOTO-CHROMOSCOPES.

To the EDITORS.

GENTLEMEN,—In the last issue of THE BRITISH JOURNAL OF PHOTOGRAPHY I notice a communication from M. Léon Vidal, in which he describes the chromoscope of M. Natchet, and suggests that there "may be other photo-chromoscopes, quite as simple as Mr. Ives's, that produce equally remarkable results."

My object in writing now is to describe one of those "other photo-chromoscopes" of which I am the inventor.

As will be seen from the enclosed sketch, my apparatus is somewhat similar in outline to those of Mr. Ives and M. Natchet. We have evidently been working on the same lines; but, unlike those gentlemen, my chief aim has been to produce, not a colour stereoscope only, but a colour camera, by which one could obtain the three negatives in one short exposure, and afterwards employ the same apparatus for viewing the results.

Early in 1894 it occurred to me that there must be some simple way of combining the three images, and I soon hit on the idea of the "step" arrangement, by means of which I was able to bring them into the focus of one lens.

I constructed my first instrument of the most primitive materials. It was made out of an old box, and had plain glass mirrors for reflectors. Even with this arrangement I was able to show my friends very encouraging results. Nevertheless, I considered these results anything but perfect, owing to the double reflections from the two surfaces of the plain glass mirrors. To surmount this difficulty, I tried coloured glasses instead, but found that they only partially remedied the defect. I next turned my attention to platinised glass mirrors, but, owing to their unequal surfaces, apparently inseparable from their manufacture, the resulting distortion completely barred their use in a camera. Both kinds of mirrors, however, gave fair results when the instrument was used as a viewing apparatus.

It was not until I conceived the plan of using plain glasses slightly silvered on one surface that I succeeded in producing to my satisfaction an instrument which could be successfully used as both camera and viewing apparatus, and felt justified in applying for a patent, which I did in the beginning of last year.

By this method of constructing the colour camera the exposures are wonderfully shortened, as the whole of the light passing through the lens is utilised; and, when I have perfected certain minor details, I look forward to securing instantaneous colour photographs out of doors, as well as portraits in colours in the studio, without the necessity of inconveniently prolonged sittings.

The accompanying drawings give a general idea of my apparatus. Fig. 1 shows it in use as a camera. P, P^1, and P^2 are the dark slides containing the sensitive plates, in front of which are placed the colour

FIG. 1.

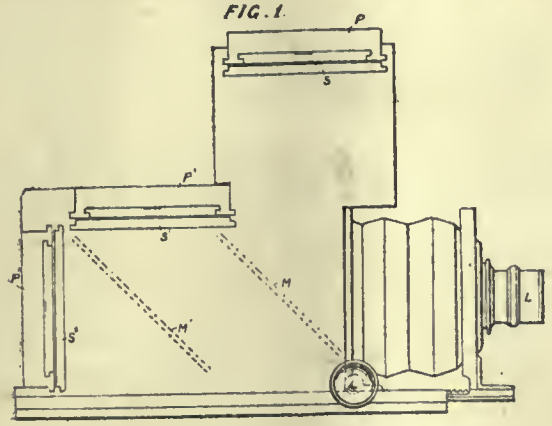
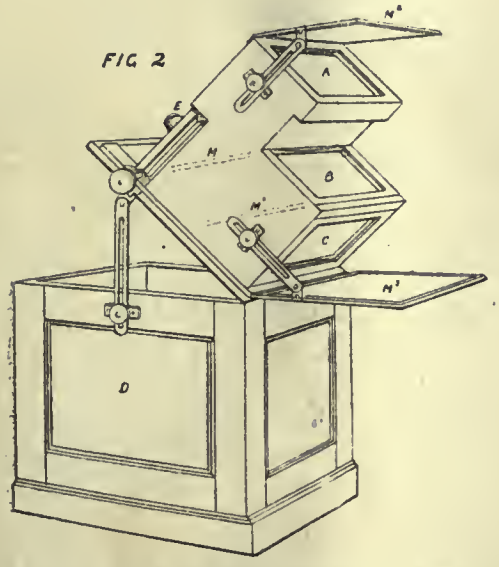


FIG. 2



screens S, S^1, and S^2. M and M^1 are the two mirrors, and L is the lens. Fig. 2 shows the apparatus as a viewing instrument or photo-chromoscope. A, B, and C are the three transparencies for the red, green, and blue-violet sensations respectively, each backed with its appropriate colour screen, and the whole fitted in frames which slide in the grooves for taking the dark slides. M and M^1 are the two mirrors already described. M^2 and M^3 are two reflectors for illuminating A and C. E is an ordinary lens or eyepiece used in place of the photographic objective. D is a box arranged as a convenient stand for the instrument, and to hold the same when not in use.

It is obvious that, by employing a pair of lenses, the instrument can be used either as a stereoscopic colour camera or a stereo-photochromoscope.—I am, yours, &c.,

B. J. Edwards.

The Grove, Hackney, February 4, 1896.

To the Editors.

Gentlemen,—The photo-chromoscope, which Mons. Vidal praises and credits to Mons. C. Nachet (p. 78), is my own invention. Mons. Vidal's drawing does not show a single detail (nor does he mention one) which I had not patented on July 3, 1894 (date of filing of complete specification in U. S. Patent Office). The photo-chromoscope, which has heretofore been ascribed to Mons. Nachet, is a totally different, irrational, and (in my opinion) worthless contrivance. It will not do for him to claim, at this date, the instrument which I patented so long ago.

Different men do sometimes hit upon the same idea; but I do not know of a single authenticated instance of such a complete instrument or machine which has developed exactly alike as to detail in the minds of two men. The duplication of the form and arrangement of the photo-chromoscope proper, and its combination with the tray for chromograms, hinged reflecting mirror, devices for fixing the angles of inclination, and the phraseology of description, I feel sure is something more than a coincidence of thought. Certainly Mons. Nachet, who knew no better than to try to reproduce compound colour sensations by viewing one colour element through one eye, while viewing the others through the other eye (as in his instrument of about two years ago), is not the man to duplicate my thoughts in detail.

Mons. Nachet cannot manufacture the apparatus in France, without infringing my patent rights; and Mons. Vidal should not have credited to Mons. Nachet the invention of an instrument which he did not show until a year (?) after it had been publicly exhibited and described by me. I am not, however, surprised at this action, for I have, on other occasions, received similar treatment from Mons. Vidal and his friends.—I am, yours, &c.,

F. E. Ives.

119, *Shaftesbury-avenue, London, W.C., February* 1, 1896.

THE RECENT LIMELIGHT COMPETITION.

To the Editors.

Gentlemen,—I was much surprised to see, in your report of the jet competition held on January 22, that Mr. Scarborough's jet and my own, which were the two most powerful jets exhibited, "were declared to be of equal light-giving power." This version of the trial I consider hardly fair to me for the following reasons, which many gentlemen present will, doubtless, recollect and be willing to corroborate if necessary.

At the first trial the reading was given in my favour, and Mr. Scarborough had to advance his lantern before those present considered his light equal to mine. Not being satisfied with this result, he demanded a second trial, which was accorded to him, the result being again declared in my favour. Some delay then occurred while other jets were trying conclusions with me, my jet being kept burning the whole evening while these were being disposed of.

Mr. Scarborough, being still dissatisfied, desired another reading, the result this time being that both lights were declared equal; but, as I previously mentioned that my jet had been burning the whole evening and the supply of gas must have run very low, I do not consider this test conclusive, but, as I understood Mr. Hearson to say that my jet scored one point above Mr. Scarborough's on the whole trial, I did not press the matter further. I think it also necessary to state that my jet is constructed with a view to extreme portability as well as high illuminating power. The mixing chamber of Mr. Scarborough's jet was of most unusually large dimensions, and was not, I believe, the one he competed with at the former trial, but was considered some twenty-five per cent. more powerful.

As an ether saturator present was declared to equal the best mixing jet, I think it should be known that this result was obtained when the saturator was coupled to my jet for trial.—I am, yours, &c.,

G. W. Gwyes.

Bourneville, Sneyd Park, Bristol, February 3, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affair should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

Photographs Registered:—

Mr. A. Barnes, 14, Cheap-street, Bath.—*Photograph of a Roman bath, excavated at Bath.*

Mr. T. Taylor, 481, High-street, Kirkcaldy.—*Photograph of the late Rev. J. Johnstone, B.D.*

Mr. W. Atkinson, 67, Grove-road, Eastbourne.—*Photograph of the late Alderman W. E. Morrison.*

*** We have again, through extreme pressure on our space, to hold over much interesting matter. Several contributors and correspondents will therefore understand the reason their articles, &c., have been delayed in publication.

Wynne's Exposure Meter.—F. W. The address of the maker is Wrexham.

Free Portraits.—L. Naish. Thanks. We have very frequently referred to the matter.

Lens for Copying.—J. B. S. asks: "Can you please tell me if a Dallmeyer 10×8 triple achromatic lens would be suitable for reproduction work for half-tone blocks?"—In reply: Yes.

Formalin.—In Limine asks: "Where can formalin be obtained by purchase?" In reply: Of Messrs. Fuerst Bros., Philpot-lane, E.C. We shall be detailing further experiments shortly.

Frames, &c.—Ralph Leslie. Consult the advertisements in the advertisement columns of the Almanac. You will find there the markets you require. It is against our rule to recommend any particular manufacturers.

Gelatine.—C. Turner.—If the gelatine has got mouldy from being stored in a damp place for several months, we should not recommend its use for experiments in dry-plate making, or even for enamelling silver prints with.

Books on Photo-microgaphy.—Pettingell says: "Would you oblige me by letting me know the names and publisher of any works on photo-micrography for making slides and negatives from microscopic specimens." In reply: Messrs. Iliffe & Son, St. Bride-street, publish such a book by Mr. Andrew Pringle.

BURNISHING CARBON PRINTS.—RONALD FIELD. Carbon prints can be burnished with a hot burnisher, but they must be perfectly dry at the time, otherwise they will suffer injury. Lubricate them with the usual Castille soap lubricant.

ADDRESS WANTED.—G. PITCHER says: "I see it mentioned in your valuable paper that Messrs. F. S. Thorn & Co. manufacture a generator for calcium carbide. I should be glad of address." In reply: The address is 169, Camberwell New-road, S.E.

RÖNTGEN PHOTOGRAPHY.—H. RENBOLD says: "Would you be so good as to enumerate the necessary articles and directions for the production of the Röntgen photographs?"—In reply: Read Professor Röntgen's paper in the last number of the JOURNAL.

LENS FOR GENERAL WORK.—T. BARCLAY wants to know the best lens, at a moderate price, for general all-round work—out-door work, groups, &c. The best and most useful lens for such work, at a moderate price, is one of the "rapid type." One of about sixteen inches focus will be the most suitable for 12×10 pictures.

PHOTOGRAVURE PATENTS.—EXPERIMENTALIST (Notts.). So far as we know, there are no patents in connexion with photogravure. There were some, but we believe they have all lapsed now. You can certainly practise the process, which has during the past year or two been demonstrated before the societies without let or hindrance.

STUDIO.—LEACH. Either sketch No. 1 or No. 3 is preferable to any of the others. As the studio will be shaded from the south by a very high building, we should recommend No. 3, the "lean-to form." Hot-water pipes for heating will be found far more cleanly than a coke stove, and gas fires, to heat so large a studio, will prove somewhat costly.

AMATEUR AND PROFESSIONAL.—W. G. C. asks: "If a person keeps a shop selling photographic materials, and also takes photographs of the neighbourhood, which he shows in his window, 'and sells' in the usual way of business, can this person be considered an amateur, and exhibit in amateur exhibitions as an amateur?"—Certainly not. He is in every sense of the term a professional.

PATENT.—INVENTOR asks: "What is the cheapest protection I can get for a new piece of apparatus? Would not registration be cheaper than a patent?"—Registration would be of no use. The only protection is a patent. A patent for four years costs four pounds, or provisional protection, which lasts for nine months, costs but one pound. Of course those are the Government fees, and, if a patent agent is employed to take out the patent, his charges will be an addition.

COPYING OIL PAINTINGS.—It is not usual to prepare the surface of oil paintings with anything prior to photographing them, beyond sponging them over with clean cold water, to remove the dirt. Various substances have, at times, been recommended for treating the painting with—glycerine amongst the number—but their use is attended with future danger to the picture, and are now seldom used; indeed, the owners of valuable paintings will not allow of their employment.

OSITIVE INSTEAD OF NEGATIVE.—O. ST. JOHN KNELLER writes: "Some time ago, on developing an instantaneous photograph, I was greatly surprised to find the image was positive instead of negative. Should you think this matter worth further investigation, I should be pleased to furnish any further details in my power."—There is nothing novel in the phenomenon. The plate was either (1) over-exposed, or, (2) before development was exposed to the dark-room light too long.

COPYRIGHT.—W. S. W. says: "An operator who has left me, and is setting up in business for himself, says that all the views he took while in my employ I have no copyright in, and that I can't publish any of them if he likes to prevent me; also, that if he likes he can compel me to hand him the negatives."—Nonsense. Although you may have no copyright in the negatives, they are your property, and, as he took them as your servant "for a valuable consideration," his salary, he can have no copyright in them.

COST OF NITRATE OF SILVER.—T. WALLER writes: "I am commencing some experiments which will probably, before they are completed, take forty or fifty ounces of silver. Will you please tell me if it would pay me best to make the nitrate or to purchase it? What do dry-plate makers and other large consumers of the nitrate do?"—They purchase the nitrate, and you will find it far more economical to do the same. Making nitrate of silver is not a pleasant operation, and, without proper appliances, there will be considerable waste.

CEMENTING GLASS.—J. READER says: "I have an old glass dipper, such as was used for the silver bath, and the glass strip has become detached. Can you tell me of anything to stick it on again with that will not injure the silver solution?"—It may be cemented on again with either marine glue or shellac, neither of which will hurt the solution. We prefer the former, as it is not so brittle as the latter. Both the dipper and the slip should be made very hot before the cement is applied, and then the two glasses should be pressed firmly together till they are cold.

CRITICISM OF PHOTOGRAPHS.—ALPHA says: "I enclose a few photographs for criticism and advice. Any hints for the improvement of my work which you may give me I shall esteem a great favour. Perhaps I should explain that I am only a beginner; it is only six months since I first began photography. I have got very fond of the work, and am anxious to improve.—In reply: For a six months' worker the photographs are, in the main, capital. 1. A very good bit of portraiture. 2. Negative possibly too hard, the print being chalky. 3. Negative appears to have been either fogged or over-exposed. 4. Very good, but the vignetting does not improve the effect. 5. Slightly out of focus. 6. Ditto. 7. Excellent. 8. Same as five and six. Summing up, we should say that, artistically, the figure studies are very promising, and that, as regards selection and treatment, the outdoor subjects give scope for improvement in those respects. By all means write again.

NEGATIVES OF SITTERS.—AMATEUR (London, N.W.) says: "I am an amateur, and want first-class negatives of some of my friends to print from myself. Of course, as I can print, I do not want to pay the price for prints that good professionals charge for them. On applying to some artists, they indignantly refused to take the negatives at all, and others only at such a price as is prohibitive. Is not this very unfair to one who knows the cost of everything that is used?"—No. Every one is entitled to conduct his business on his own terms, and many photographers guard against their reputation being injured by inferior prints being produced from their negatives by declining to part with them on any terms.

PHOTOGRAPHIC SCHOOLS; HELIOGRAVURE; PHOTO-CERAMICS.—MADRAS says: "I shall be greatly obliged if you will answer the following questions: 1. Are there any schools or classes of photography for amateurs in London? and, if so, where? 2. Is the heliogravure process peculiar to one firm, or is it generally used by photographers? If the latter, where should one apply for particulars? 3. From whom could a professional photographer get reliable information regarding photo-ceramics, and where are the best materials for the process obtainable?"—In reply: 1. The Polytechnic, 309, Regent-street, W. Write to the Secretary for particulars. 2. Heliogravure is a name given occasionally to photogravure, which anybody may work. 3. Messrs. Dawbarn & Ward, Farringdon-avenue, publish a book on the process.

NON-ACHROMATIC LENS.—ALPHA says: "An answer will oblige on the following: There are some small lenses sold for hand cameras—they are called, I believe, "periscopic," and consist of two glasses, something like two small watch glasses at the end of a tube. What I wish to know (the glasses not being achromatic in the sense that a single combination achromatic lens is) does the visual and chemical focus coincide? In other words, does the lens require adjusting nearer to or farther from the focussing screen than the picture shown thereon in order to take a correct photograph?"—The chemical and visual foci will not coincide, and the lens will require to be adjusted nearer to the focussing screen after the object is focussed. The distance will be about one-thirtieth of the focal length of the combination; but the exact distance is best ascertained by experiment.

TONING.—AN OPERATOR OF TWENTY YEARS' EXPERIENCE writes: "May I claim your assistance under the following circumstances? I am at present engaged as operator and retoucher with a man in London, and my employer lately has taken to sensitising his own paper, which he floats on a seventy-grain bath for half a minute, and keeps the prints from Monday to Friday night, when they are all toned. He makes the toning bath of acetate of soda, and expects seven grains of gold to tone twelve sheets of paper, but he cannot get them to tone quickly, taking about two hours to tone the twelve sheets. The consequence of this is that he accuses me of putting something in the toning bath to stop its action. He suggests hypo. I must here mention that a sample of ready-sensitised paper toned in the same bath with the home-sensitised gave perfectly satisfactory results, which he admitted. If I send you some of the bath that is left, with our home-sensitised paper, would it be too much to ask you if you would be kind enough to test the bath to prove that hypo has not been put into it, or any other chemical likely to stop the toning? I am in a most unpleasant position, and should feel extremely grateful if you would settle the matter for me. In my opinion it is a most wicked and unfounded charge to make against an assistant without positive proof. If you make any charge, I will most willingly bear the expense, and be thankful to clear myself of this wretched accusation."—Twelve sheets of paper is too much to expect seven grains of gold to tone quickly if deep tones are desired, particularly with home-sensitised paper, after it has been kept several days. If one sample of paper tones well in the bath, it is a clear proof that the bath is all right, and that the charge is quite unfounded and equally unwarrantable. Much as we sympathise with our correspondent, our time will not allow of our making the desired examination.

RIGHT TO NEGATIVE; CAMPHOR IN OIL.—JAMES BENTLEY writes as follows: "I would like to ask your opinion on a case that has just occurred between me and the Rector of St. Mark's, Shilton, a suburb of Hanley. On Monday, January 27, after the church had been reopened after renovation and installation of electric light, I wended my way down about ten a.m., and when looking inside I saw the curate (and as I often take my camera with me, as on this occasion), I asked him if he had any objection to me taking the inside. He said, No. And he stayed with me, and, after my taking a view looking towards the chancel, he asked me to take him one including the two altars in the church, which I did, and, to my surprise, at night, while the negatives were wet, the rector sent and demanded the negative. Of this I took no notice, but sent him word I would supply him with a print of them. On Saturday last I met him, and told him, as an amateur, I did not want to make money of them, but took them for the love of the art; but he threatened me with legal proceedings if I did not send him the negatives. Now, sir, I wish to ask you, as I am only a working man, whether he can do any such thing as demand the negative, when I had permission of the curate to photograph the interior of the church? In your issue of January 3, 1896, a question appears *re* burning oil in lantern, and whether camphor improves the light. I can say from experience that the addition of a penny square of camphor to the quart whitens the light and makes it less smoky; but to get the light *par excellence*, if expense is no item, use olive oil, and he will get a splendid light and smokeless. This is what I use for my cycle lamp, and can recommend the same to my photographic friends who cycle and photograph, which I have now done for several years."—As the negatives were taken with the consent of the curate, and two at his suggestion, we should certainly not give them up. The rector's request is unwarrantable, and, as for the threatened legal proceedings, it is simply "bluff," which we are surprised that any clergyman should indulge in. Thanks for reply about the addition of camphor.

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EX CATHEDRÂ.

We are pleased to learn, from a letter sent us by Mr. Drage, the Honorary Secretary of the Convention, and which will be found in our correspondence columns, that the arrangements for the Leeds meeting in July next are in process of completion, and that Messrs. J. H. Walker, Godfrey Bingley, and Herbert Denison, who comprise the principal members of the local executive, are already hard at work in the endeavour to make the gathering a success. From personal knowledge of the gentlemen named, we are persuaded that they will spare no effort to render the Leeds meeting of the Convention a memorable one, and we hope, and indeed are confident, that they will find their labours rewarded, if only partially, by a large gathering.

* * *

Mr. T. C. Turner (of Messrs. Turner & Drinkwater, Hull), to whose *Trilby souvenir* in photogravure we had occasion to make appreciative reference a fortnight ago, sends us a number of albumen prints from negatives taken of several of the principal performers in that piece. The prints have a richness and beauty about them to which we are not often accustomed in modern albumen prints, and several photographers of long experience, to whom we have shown them, pronounce them to be exceptionally fine. With such examples of flawless surface prints before us, it seems anomalous that we should have to refer to albumen printing as on the down grade in photographic estimation.

* * *

Professional photographers may possibly profit by a useful hint which Mr. Turner gives as to the treatment of negatives from which large numbers of prints are taken. He says: "The negatives of *Trilby* have been used for printing hundreds of copies from each plate. They are kept clean and bright by washing in pure alcohol every twenty-one days and revarnishing. It is worth the trouble for heavy printing."

* * *

Reverting to the *Trilby souvenir*, here are some further observations by Mr. Turner which, as they are of interest to so many professionals at this juncture, we take the liberty of reproducing. Our correspondent advises his brethren not to be so ready as some appear to be in disposing of their profitable rights to printers and publishers. It is sound advice. "The feature of most interest to the profession in this *souvenir* production is that the whole transaction has remained entirely in my hands. I hear so often of photographers allowing publishing rights for a guinea or five guineas, when probably printers or publishers are going to make a large sum out of the use of those photographs, and it does seem so foolish.

* * *

"The *Trilby souvenir* was produced on these lines. I arranged to photograph the company, and to supply Mr. Tree with the best *souvenir* I could get up at a fixed price, which, of course, had to be strictly moderate. The copyrights were to be my property, and I had the right of publication outside the theatre. It thus became a question of supplying the theatre on the one hand and the publisher on the other, and the profits in a fair degree came to the originator of the work. Now every *souvenir* sold in this country or in America directly benefits me instead of the printers and others. I need hardly add, too, that the theatrical managements reap a direct benefit by this *modus operandi*, both on the score of price and the method of reproduction, which the majority of good photographers understand better than publishers. To repeat myself more briefly, I would say that, while printer and publisher are

absolutely necessary, the photographer in these matters should be master of the position, and not, as he sometimes degenerates to be, the servant of one or the other or both."

* * *

Our American cousins are early in the field with acetylene generating and projection apparatus for lantern work. Messrs. Walmsley, Fuller, & Co., of Chicago, have sent us a copy of their catalogue, which is entirely devoted to the acetylene light for projection and photo-micrographic purposes. It is replete with instructive hints to intending users of acetylene.

* * *

Our readers will, doubtless, be glad to know in advance the subjects that are set down for discussion at the remaining meetings of the Royal Photographic Society during the current session, and we accordingly append the necessary particulars. It will be observed that a singularly varied, interesting, and unconventional programme has been arranged:—February 18, Photo-mechanical Meeting, *The Working up and Hand Engraving of Half-tone Blocks*, by Mr. W. Cheshire. February 25, Technical Meeting, *The Stereoscopic Photo-chromoscope*, by Mr. F. E. Ives; *Messrs. Newton's Simple Method of Projecting Stereoscopic Pictures*, by Mr. T. E. Freshwater, F.R.M.S.; *Stellar Photographs taken without a Driving Clock*, by Mr. J. Lunt, B.Sc., F.C.S. March 10, Ordinary Meeting, *Notes on Medical Photo-micrography*, by Mr. Edmund Roughton, F.R.C.S., and Mr. Charles Cosens, M.R.C.S. March 17, Photo-mechanical Meeting, *Screens for Process Work*, by Captain Collardon; *A Note on Photogravure*, by Captain Collardon. March 24, Technical Meeting, *The Relative Colour Sensitiveness of Ordinary and Isochromatic Plates*, with a demonstration, by Mr. F. E. Ives. April 14, Ordinary Meeting, *On Printing Densities*, by Captain W. de W. Abney, C.B., F.R.S., &c. April 21, Photo-mechanical Meeting, *Photo-mechanical Notes of Historical Interest*, by Mr. T. Bolas. April 28, Technical Meeting, a demonstration of Woodbury printing and its applications, by Mr. J. D. Geddes. May 12, Ordinary Meeting, *The Recording of High Temperatures by Photographic Means*, by Professor W. C. Roberts-Austen, C.B., F.R.S., &c. May 19, Photo-mechanical Meeting, *Photo-mechanical Methods in Austria*, by Mr. Ignatz Herbst. May 26, Technical Meeting. Apparatus for photography on small plates (smaller than quarter-plates). Those members who can assist in this matter, especially by exhibiting apparatus, are invited to communicate with the Secretary. June 9, Ordinary Meeting, *Cellulose and its Derivatives*, by Messrs. Cross and Bevan. June 16, Photo-mechanical Meeting. June 23, Technical Meeting.

* * *

The Vienna correspondent of a daily contemporary says that "highly sensational intelligence comes from Rome concerning an alleged invention of Professor Salvioni, of Perugia, which, if true, will revolutionise optics and considerably modify even certain social institutions. The Professor read a paper before the Medical Academy on Röntgen's recent discovery, and described the instrument which he (Salvioni) has just invented, by means of which rays of invisible light are made to impart to the eye the capacity of seeing through all objects which those rays can penetrate, and of beholding the contents of opaque receptacles. Salvioni, not content with this description, is said to have produced his invention, and shown the physicians the contents of a closed aluminium box."

Many authorities are inclined to think that the practical value of the application of the X rays to photo-surgical purposes has been overrated. Among others, Dr. Vaughan Harley, in the course of an interview, is reported to have said that Professor Röntgen's discovery was scientifically of absorbing interest, but at present, so far as surgery was concerned, it was not of much use practically. The bones of a hand, by means of the new rays, could be photographed in two minutes, but, before such a result could be obtained with the thicker portions of the body, there must be a further development of the rays. To photograph the trunk would take from fourteen to twenty-four hours, and for a subject to remain quiet during such a prolonged period was a physical impossibility. Quite recently Professor Ramsey, the discoverer of argon, used the Röntgen method in an endeavour to ascertain the locality of a bullet which had entered the fleshy part of a man's leg. The sufferer exhibited much patience, but the rays were not powerful enough to affect the photographic plate in a reasonable time. The great obstacle to successfully photographing through deep layers of flesh was the difficulty of making a good bulb in which to produce the rays.

PHOTOGRAVURE *VERSUS* THE "NEW ART."

It is not very long ago that Professor Herkomer, R.A., in one of his speeches, strongly denounced photogravure as "a very evil thing." Now he is figuring as a joint patentee with Mr. Henry Thomas Cox of a process for mechanically producing printing plates from oil paintings, and which he is vigorously exploiting. A syndicate has been formed to work the process, and a week or two back it was demonstrated at the Fine Art Society's rooms before the art representatives of the lay press. The critiques were wonderfully unanimous about the virtues of the process, and so much so in the same language, that it suggests that they were all inspired from the same source. The technical press was not invited, but probably there was a reason for that.

Let us just consider this new process of Messrs. Herkomer and Cox, and see if it is likely to prove in practice superior to, or so good as, the "very evil thing" it is intended to compete with commercially. The process, as demonstrated, is this: The artist himself produces his picture on a silvered copper plate, with a particular kind of ink or paint, and, while the colour is still tacky, it is dusted over with a brown powder, which adheres to the paint in proportion to its thickness. It has been stated that the coarser particles adhere only to the deepest shadows, where the paint is thickest, and the finer ones only on the more delicate tints, where it is thinnest, so that a discriminating grain is said to be obtained. The superfluous powder is then brushed off, when the plate is ready to be handed over to the "painter engravers' syndicate" to make an electrotype from. This electrotype forms the printing plate.

A little mystery has been made about the particular paint and the brown powder which is to be supplied by the syndicate. On reference to the specification of the patent, we find that the paint is composed of equal parts of almond and castor oils, mixed with German or lamp-black. In the specification it is mentioned that the castor oil is to retard the drying, but those conversant with oils would say that it was the almond oil which fulfilled that end, that being a non-drying oil, whereas the castor is a drying oil, though a somewhat slow one. The powder, as given in the specification, is a simple

mixture of powdered asphaltum and bronze powder in equal parts.

The method of obtaining the grain is precisely analogous to the Waterhouse process, from which the idea was probably obtained. In this process the granular matter—sand, powdered glass, or the like—is applied to a gelatine relief—an ordinary carbon print on a silvered copper plate, while the image is in a moist and adhesive condition; and, in the Herkomer-Cox process, it is applied to a hand-painted picture, on the copper, in oil colour. In the Foxlee modification of the Waterhouse method, powdered asphaltum, or resins, are used instead of the sand or glass. In each of these processes the granulated picture is afterwards electrotyped, and the electrotype forms the printing plate, as in the "new-art" process. There is this difference between the old and the new processes: in the Waterhouse the granular matter is removed before the electrotype is made; in the new one it is not, consequently, that portion of the grain which is relief in the one case is in intaglio in the other.

Let us now consider the Herkomer-Cox "new-art" process, as compared with photogravure, from a practical and business point of view. It is claimed for the former that the original touch of the artist is retained without any intervening operations; but will it be? A touch will be retained, it is true; but will it be *the* touch? We say, No! It is pretty well known that, if a painter attempts to translate one of his own works into monochrome, in nine instances out of ten the result is a failure, or, at least, is far inferior to what it would have been had the work been done by an engraver. As the powder is said to adhere in proportion to the thickness of the paint, the artist will have to take thickness of colour, as well as tones, into consideration in his manipulations. In the demonstrations of how the grained paint *cliché* is produced, in addition to brushes, leathers, dabbers, pointed bits of wood, the finger tip, under cushion of thumb, &c. were used. How far the ordinary artist will adapt himself to manipulating with such tools as these, while attempting to retain his characteristic touch, we can only surmise.

Again, take painters whose *forte* is broad effects on large and coarse canvas: how will they succeed in translating their large works on to a plate of engraving dimensions, say a reduction from a six or eight feet picture to a twenty-four inch plate, for example. Will they be able to work on a proportionately small scale and yet retain their individual touch with the means that have to be used? There is a wide difference between a portrait by a Watts on canvas and a miniature on ivory by a Cosway. Further, how will the artist, who is only used to painting on more or less coarse canvas, get on when working on a burnished metal surface? In the Herkomer-Cox specification it is mentioned that the electrotype plate may be used as it comes from the bath, and adds: "but, when the artist is familiar with the resources of the experienced engraver, the dry point may be used, or the process of etching or mezzotint may be applied, for working up the picture and producing brilliant artistic effects." From this it may fairly be assumed that the plates require working up by hand to obtain the best effects. Hence the artist who would work the new process must needs be an experienced engraver as well as painter to produce good results.

We will now turn to photogravure, which Mr. Herkomer has loudly decried. Here we take the original painting and reproduce it by photography direct to the size desired. In doing this the characteristic, and individual, touch of the painter is preserved in its integrity, and in true proportions as regards the size of the plate and painting; and not on a larger scale, as would almost necessarily be the case if the artist had to copy the original on the small scale. By orthochromatic photography the colours will be better rendered in monochrome than nine out of ten painters could do it with the differing thicknesses of paint on the burnished copper plate. We need not, however, dwell on this subject further, for we, like most who take a practical view of the matter, feel sure that, notwithstanding the way it is being boomed in certain quarters, photogravure has not anything to fear from the "New Art" process either artistically or commercially.

THE SULPHOCYANIDES AS FIXING AGENTS.

II.

On reference to the table of solubilities of the silver haloids, by Valenta, published in the Almanac, it will be seen that on the score of solvent power the sulphocyanides are far superior to hypo when we have to deal with bromide proofs, though hypo is as far ahead of the other when chloride of silver is concerned. The latter fact might be taken as explaining the imperfect fixation alluded to, were it not that, as we have already mentioned, the strength of the fixing bath and length of immersion had no effect in surmounting the difficulty; but, when an immersion of several hours produced no better effect than one of a few minutes, the cause is evidently to be traced in some other direction.

We know perfectly well what occurs in the process of fixing with hypo; the silver salt is dissolved, and forms a double hyposulphite of silver and sodium, varying in solubility according to the proportion of fixing agent present. The precise action in the case of the sulphocyanides has not been so thoroughly investigated, and, whether the change that occurs in the process of fixing is a chemical, or merely a mechanical one in which the silver salt undergoes solution without further change, we are not prepared to say, but several points in the behaviour of solutions of the silver haloids in sulphocyanide of ammonium would point to the latter. So far as the completeness, or perfection of fixing, or the permanence of the proofs fixed is concerned, it would not matter much which is the correct explanation if the silver salt remained in solution; but it apparently does not, as may be quickly recognised by fixing a bromised or bromo-iodised collodion film in sulphocyanide. We leave gelatine out of the question, on account of the powerful softening or solvent action of the sulphocyanide on that substance.

If a collodion film be immersed in a solution of sulphocyanide of any strength—it is immaterial whether it be saturated or comparatively weak, provided it is strong enough to remove the silver haloids—the plate will be fixed in the ordinary manner, that is to say, the bromide and iodide will be dissolved, and the portions of the film unacted on by light will be rendered transparent; but, if the plate then fixed be laid in a dish of water, it will be seen that the haloids are partly precipitated again, some portions being washed out into the solution, others being deposited in and on the film, giving it the appearance of having been imperfectly fixed. A second immersion in the fixing solution will remove this appearance, and, if it be a fresh and unused solution, there will probably be an end of the difficulty; but, if it be partly charged with silver from repeated use, the chances are that there will be a second though less marked deposition of the silver.

If this occur with bromide of silver, which is extremely soluble in sulphocyanide, how much more likely is it to occur when the chloride, which is the less soluble, is in question? and, if this reprecipitation occur with chloride of silver on a paper print, there is nothing to show that it has happened until the print is exposed to a strong light, when, of course, a greying of the chloride will take place over the whole surface. This, we think, fairly explains the reason why sulphocyanide proved for prints, at least, a "fixing agent that will not fix," as it was dubbed many years ago.

In its application to the fixing of negatives we are more fortunately placed in being able to recognise any considerable deposition of silver in the portions of the plate that should be clear, and so in a position to repeat the fixing if necessary. In cases where the fixing, or, rather, the subsequent washing, forms the final operation, no further trouble, perhaps, will occur, but it still remains questionable whether, under such circumstances, it is any safer to resort to intensification after fixing than when hypo is used. A very minute trace of silver in the shadows of a negative or the lights of a transparency, a trace so minute as to be practically invisible to the eye, will be quite sufficient to cause discolouration and ruin when the pyro and silver or mercury intensifiers are afterwards applied, and there is this additional disadvantage with sulphocyanide as compared with hypo, when the fixing has been "perfect," that the danger cannot be removed by any amount of washing, since the silver is present in an insoluble form. Sulphocyanide, in fact, leaves the plate in much the same condition that it would be in if insufficiently fixed with hypo.

Photography in Colours.—In the light of recent investigations this can no longer be regarded as a cry of "Wolf," but we shall need more information before being sanguine about the most recent discovery as given in some of the American papers, which state that two Chicago investigators have succeeded in discovering this photographic "philosopher's stone." Their names are given—Messrs. M. J. Steffens and J. W. MacDonnough. The former uses the Daguerreotype process, while some method of utilising glass screens is employed by the latter. The whole thing seems to be a hash up of Professor Joly's inventions.

Swiss Photographs Wanted.—We have pleasure in giving publicity to a request made through the columns of *Nature* by Léon Du Pasquier, Neuchâtel, for photographs that may assist in discovering the causes leading up to the avalanche of the glacier of l'Altels. To make clear the points referring to its cause, he writes that the Glacier Commission needs photographs taken before the disaster, even going back several years if possible. After having fruitlessly endeavoured for several months past to obtain such views, he feels sure that many photographers must have photographed l'Altels from the W. or N.W., and he asks any who have done so to send prints to him, indicating the date they were taken, at least to the month and year.

"Made in Switzerland."—This cry will, we fear, soon be as common as the more familiar label referring to Germany as the place of manufacture of goods which used to be made, and ought still to be made, in our own country, for it is certain that in the manufacture of scientific instruments the Switzers are already competing seriously with us both in quality and price. Only the other evening, when Colonel Stewart was showing his new panoramic apparatus to the Camera Club, he was asked who was the manufacturer. His reply was that it was made in Geneva, that he found that he could not get it made as he required it to be made in England, but that his wants were readily met at Geneva. The cost, too, was one-third less than the price asked by the British manufacturer. We have heard many stories of a like nature which are corroborative of Colonel Stewart's experience. In one recent case a patentee informed us that it was much cheaper to have the parts of instruments made in Switzerland, and imported over here to be put together, and to pay all the costs of the carriage, than to have the thing constructed, *ab initio*, here. It was not only cheaper, but the work was far better done. "'Tis true, and pity 'tis 'tis true."

The Röntgen Rays.—The interest in the new photography still continues unabated, and from many quarters we have accounts of successful followers in Röntgen's path. So much is this the case, and so comparatively simple does the process appear, that it seems wonderful that their remarkable properties were not made known at an earlier period. As a matter of course, there are many claimants to prior discovery; but the claim is for the same thing—with a difference. There is a fair consensus of evidence that photographic action has been brought about through opaque bodies by radiations of electric origin, but Röntgen's rays are different from all. An opinion has been expressed that the discoverer is holding something back; but results equalling his have, at any rate, been obtained by apparatus put together with no other guide than the newspaper accounts of Röntgen's work. Sparks from an ordinary Ruhmkorf's coil have been used, as also the ordinary Geissler tube, through which an actual current passes unlike the Crookes' tubes, in which the "current" can only be said to pass in the popular sense of the word, the vacuum being so nearly perfect.

We have already put on record some strange light effects produced through opaque bodies, notably M. Le Box photographing through a sheet surrounding a dark slide enclosed in a slide, no other source of light than a paraffin lamp being used; but surely a letter in last week's *Nature*, over the signature of W. Saunders, is the most remarkable contribution of the kind. "Upon a piece of board I placed a sensitive plate, on this a penny piece, with the obverse side downward, and on the penny piece a $\frac{3}{16}$ inch cedar board. The whole was exposed to the light emitted by the burning of sixteen inches of magnesium wire at a distance of six inches. An inspection of the photograph will show a distinct image of the Queen's head." What can be the use of writing this sort of thing? No mention is made of any protection against the entry of reflected light at the side, under which conditions it could be easily imagined that some indistinct impression of the coin would be visible.

Soldering Aluminium.—For such work as joining the edges of the metal in making tubes for optical work, the difficulties of soldering aluminium were long considered a great drawback to its possible future usefulness for these purposes. Improvements have been made, but, from a paper read by Mr. J. Richards before the Franklin Institute, we learn that a method has been discovered by him of reducing the soldering to a very ordinary operation. In his paper he points out how Christoffe, the goldsmith of Paris, showed that the metal could be soldered by either pure tin or pure zinc; but the discovery proved useless, for the zinc junction is brittle, will not stand working, and soon discolours, while the tin seam disintegrated, and fell to pieces in a few weeks. Other inventors recommended the use of ordinary solder, with the use of chloride of silver as a flux, which would naturally be costly, and some one has proposed this as a reason for the enormously high prices of aluminium-mounted photographic objectives.

Mr. Richards set himself the task of discovering a solder possessing the necessary characteristics: 1. It must heat, and adhere closely; 2, must not disintegrate after exposure to air; 3, have a low melting point; 4, be the same colour as aluminium, and not change colour; and finally, 5, must be cheap enough for general use. These requirements he obtained to a reasonable extent after a series of experiments, but it was discovered that, upon remelting this solder, a more fusible portion separated from the mass, and this was found to

act still better under the iron than the first-made. The composition of this was proved on analysis to be aluminium, one part each of phosphor-tin and aluminium, eleven of zinc, and twenty-nine of tin, the two latter being present in the proportion given by the formula Sn_1Zn_3. He says, "The result of the investigation is before you in the specimens of soldering presented for your inspection. As practical usefulness is a fair criterion of the value of an invention, I may be permitted to mention that this solder has come largely into use in Germany, Switzerland, England, and our own country." If all that is claimed for it be true, the use of this new solder ought to lead to a cheapening of aluminium-mounted lenses, the price of which, notwithstanding the admission of the difficulty in working it in the lathe, tapping it, &c., is still very high.

ON AN IMPROVED METHOD OF COATING PAPER FOR DIRECT PIGMENT PRINTING.

In my paper on the subject of the Artigue Papier Velours, and similar methods of carbon printing without transfer, I pointed out that the preparation of such paper one's self was not unattended by difficulties. In the hands even of the most experienced, results were variable, and one was obliged to admit that it was somewhat difficult to ensure such an even coating of the paper as should give full value to the effects which one might desire to obtain in the print. A very great step in advance has been made by Monsieur Demachy, and was communicated by him to the Photographic Society of France a few weeks ago. We must be prepared, of course, to be told by scientific men that they knew all about it before, and that it is only a modification, and so on; but, although I shall use no chemical terms of unparalleled length in describing it, and although the novelty is absolutely as simple a thing as the breaking of the egg by Columbus, I have no hesitation in saying that it is entitled to all the merits of a new discovery. The simplification of former difficulties is very striking, and, indebted as we are already to Monsieur Demachy for showing us better than any others had yet done what beautiful effects could be obtained by a method which he had so far matured, we are still more indebted to him, now that he publishes gratuitously the results of his own more recent investigations—results which will go far, no doubt, towards bringing into our market direct pigment paper manufactured by our own manufacturers. I myself am personally aware that it is no mere hazard which has led to Monsieur Demachy's discovery, but that it is the result of long and patient investigation and the trial of many substances and variations.

One of the earliest to reintroduce the method of the direct coating of paper with a bichromated compound of gum and pigment was Monsieur Rouillé-Ladevèze of Tours, and a pamphlet descriptive of his process was published by him a year or two ago. He was careful in his directions to lay stress on the necessity of the pigmented mixture being of a neutral and not of an acid character; but, whether arising from this condition or not, it was difficult to obtain uniformly good results, and ease in applying the coating to the paper. The experiments of Monsieur Demachy with various colloids, alone or mixed with gum and under varying conditions of acidity, or the reverse, led him to the very simple discovery that the principal factor in the successful coating of the paper was, that the mixture should be a distinctly acid one. The procedure requires little more description or amendment of previous formulæ than may be stated as follows:—Take about equal quantities in bulk of very thick gum arabic (the common reddish kind, as thick as it can be made, may be used) and of fresh lemon juice, which homely term and substance will serve equally as well as any other. Mix well together until you get a very glutinous, soft syrup, and add bichromate of potash in solution, and the pigment to be employed, until the requisite thickness is obtained. Brush the mixture over the paper in the manner which has previously been described, making the coating even and smooth by means of a badger's-hair softener. If there is a tendency to clogging of the whites in developing, a few drops of essence of thyme (the essential oil) may be added. Those who have tried and failed with the older formula, or have succeeded only with difficulty, and with no certainty of results, will find the newer method far more easy to work, and the results immeasurably superior. The bichromate solution should not be weaker than ten per cent., for it must be remembered that it will be considerably weakened by the addition of gum and pigment. It is not pretended, of course, that the process of coating is of the press-the-button order, neither does it possess any artistic qualities of itself; but that it is a decided help and a valuable discovery will not be doubted by those who may try it.

What the action of the acid may be must be left to scientific men to determine, if they deign to notice the subject. It may be humbly suggested that it may be favourable to the production of chromic acid, but the question is one which, happily, there is not the slightest necessity for those to determine whose only object in compounding the mixture is the result which may be obtained with it from the pictorial point of view.

It may perhaps appear to be very little to crow about, so simple does the description just given appear to be; but priority of discovery is a thing so audaciously and wrongly annexed nowadays that, until evidence is brought to the contrary, we are justified, while tendering our thanks to Monsieur Demachy, in claiming for him a distinct novelty in the invention of the acid-gum process in bichromated pigment printing. By the way, is not the latter a better term than carbon printing, which would appear to be only applicable when carbon is present? It certainly is not necessarily so always.

I may perhaps be permitted to take the opportunity of replying to an article signed "C. J.," in a contemporary a few weeks back. The writer says that "the gentleman who has laboured most to introduce the Artigue method of work to the notice of photographers in this country has gone out of his way to point out what he considers an error in the text-books, wherein they say that carbon prints must be exposed (? developed) from the back, to avoid the image being washed away," &c. It may possibly be presumption on my part, but perhaps it is to myself that "C. J." alludes as "the gentleman." At any rate, I am prepared to take up the position and avow my sympathy with the sentiments expressed. I need not, perhaps, imitate the reticence of "C. J.," nor hesitate to recognise under these initials Mr. Chapman Jones. It is at least refreshing that a man of science has at length deigned to notice a discovery of such value as the Artigue method of simplified pigment printing, which has for several years been shown to be practicable. In this country, however, there appears to have been a conspiracy of silence concerning it, and it is difficult to avoid the impression that, when at last compelled to take notice of it, the object of Mr. Chapman Jones's remarks is to discount the fact that it is to Artigue, and in a lesser degree perhaps to Ladevèze and others, that we owe the discovery that what has been taught in distinct terms to be impossible is, nevertheless, to be done with the highest degree of success. Mr. Chapman Jones says that the error which I pointed out is my own, and not that of the text-books. I confess my inability to comprehend his arguments. If, for brevity, I may be allowed to give the gist only of his remarks, he says, "The fact that carbon prints *must* be transferred for development was discovered nearly forty years ago, and any tyro can prove that the facts are as stated by a few simple experiments;" and immediately after: "the other fact, that it is possible to get a chromated film so thin and even that a successful printing method can be formulated *by working wholly from the front*, is not contradictory of the first fact." It is, according to Mr. Chapman Jones, a modification only. Well, to my mind, such a statement is pure sophistry. The dictum of all text-books on carbon printing, such, for instance, as that of the Autotype Company has been, up to the latest editions, distinctly laid down. For example (page 3 of the *Autotype Manual*), "the Abbé de Laborde in France, and Burnet and Blair in England pointed out the reason for the imperfect results arrived at by Poitevin: they showed that the pigmented compound became entirely insoluble on the surface, ... *and it was clearly demonstrated that, if the pictures were to be developed at all, that could only be successfully accomplished by attacking the film on the opposite side.*" It has now been clearly demonstrated by, amongst others, MM. Artigue, Demachy, and Ladevèze that it can be successfully accomplished without attacking the film on the opposite side, and it is hardly correct, I think, to call this a modification only of the unsuccessful method. I have brought the charge of false teaching and want of knowledge on this subject

against our scientific makers of text-books, and I maintain it. Mr. Chapman Jones will hardly deny, I think, that such decided statements as I have quoted have contributed to delay the introduction into this country of the beautiful and simple non-transfer process, and to give perhaps to another country the merit of a discovery which might have been ours. As regards priority of invention, will he say when (prior to Artigue's production) he himself was first aware, from actual examples, that pigmented prints could be *successfully* developed from the front, preserving half-tones, &c.? To avoid misconception, as it is admitted that carbon prints were made in early days by exposing through the support, the claim which I make for the recent advance is the coating and subsequent development directly from the front (and, incidentally, *cold* development), and I say that, for work giving the finest detail, no one succeeded in so doing before the advent of Artigue's papier velours. It would be interesting to know also whether Mr. Chapman Jones considers that the cautioning or, rather, prohibitory clauses which I have quoted should still be promulgated in future editions of works on the subject.

I hold no brief for M. Artigue or his paper, and I am personally far more interested in the preparation oneself of paper for direct pigment printing as practised by Demachy, Ladevèze, and others. For what we call artistic work I consider this to be the most natural, the most efficient, and the most delightful to work of all printing methods. It is personal to the artist, and he is entirely free from subjection to the sphere of influence of any scientific considerations whatever.

ALFRED MASKELL.

ELECTROGRAPHY.

IN consequence of the interest occasioned by this new branch of science, I supplement my article, published in the last BRITISH JOURNAL OF PHOTOGRAPHY, with a few additional remarks.

It appears to be an anomaly to assume that the effects are produced by some hitherto undiscovered "Nodal," or X rays in the spectrum, "incapable of refraction." For the spectrum itself is a result of refraction, in which all included rays must go together. There is nothing in the phenomena that cannot be explained and demonstrated by the known laws of induction appertaining to static electricity. I cite the well-known experiment of mounting a series of discs of conducting materials, on insulated supports, in proximity to an electric machine in active operation, with intervals between them. These act reciprocally on each other with a counteracting influence, that is, if the first disc is positive, the next will be negative, and so on throughout the series; so that every substance, according to its material, placed within the sphere of electric induction, will not be passive, but, in a contrary state, either positive or negative, with neighbouring ones, and the approximated discs will be more or less affected by differences of configuration, irregularities, or conductibilities of parts of the surfaces.

It has been pertinently asked by a correspondent if glass, as stated, is "opaque" to these assumed + X rays, why the radiations from an electric vacuum tube should be available? But even glass is permeable, and subject to the influence, for, if a pane be placed in the field of induction, one side becomes positive and the other negative, constituting, in fact, what is known as the "Franklin pane." For this reason, an intervening pane in a state of electric tension may materially retard the passage to other bodies, but yet itself is affected thereby.

That feeble charges of electricity will act on sensitised photographic paper is well demonstrated by the now disused ozometer, wherein a band of sensitised paper, screened from the light, is traversed by a weather recorder or clock movement, giving a continuous dark streak of varying intensity, according to the electric condition of the atmosphere. Sometimes this would be so highly-charged as to give an interval of comparatively surprising intensity for a short period.

About thirty-five years ago a paper from me was published in the *Quarterly Journal of Microscopical Science* on obtaining photographs of objects with the microscope. For artificial light I found it of advantage to get the illuminant as close beneath the object as possible; of course I could not effect this by any ordinary lamp, so I had recourse to the sparks from an ordinary frictional electric machine, the separated terminals almost touching the object. I stated that an intermittent or flashing light was quite as effective as a continuous one; but what surprised me was that structure was brought out in parts of objects so nearly opaque as scarcely to be discernible under the instrument as ordinarily used. I exhibited specimens at the Microscopic Society at the time. I attribute this peculiar distinctiveness to the intense actinic power of the electric spark, but I am now disposed to alter my opinion. It may be remarked that the objects were mounted in Canada balsam, and were therefore insulated, and it yet remains to be seen how far insulation of the subject will effect or enhance the results in the practice of electrography.

As to the source of the electric induction, nothing can be more handy than the Wimshurst machine. My own never gets out of order or fails in energy, but it is always ready for action without any preparation.

In reference to these investigations, as far as experiments have carried them, may it not be inferred that, in the total absence of all light, certain electric radiations, analogous to induced influences, take place between differently constituted bodies or substances that will, like light, exert a chemical change on sensitised surfaces? Experiment has already gone some way towards proving this.

F. H. WENHAM.

FOREIGN NEWS AND NOTES.

Artificial Indiarubber.—In these days of artificially prepared products of all kinds, it is not surprising to hear that India-rubber can now be made by the action of bromo-nitro-toluol on nitro-cellulose, and that the elasticity and properties of the new substance can be altered by alteration of the proportions of the ingredients.

The Production of Indigo by Light.—Professor Englèr and Doraut, of Karlsruhe, have discovered that an ethereal solution of benzyliden-orthonitroaceto-phenone when allowed to evaporate at ordinary temperatures, deposits colourless neroles, which are converted into indigo blue. The special interest attaching to this is, that the colourless crystals, although remaining colourless under red glass, become greenish-yellow under yellow, and deep indigo blue under blue glass.

Photographic Journalism in Russia.—We believe that hitherto there has been a grand opening for some enterprising English photographic journalist to give play to his budding genius in Russia, for we do not think there has been a Russian photographic journal, but now we have received the first number of a monthly photographic review, which is well printed, and, doubtless, contains interesting matter; in fact, we are sure it does, because we note some extracts have been made from our columns, and, further, there is a long communication from A. B. Bapnekpe, or, as we usually call him, Mr. Leon Warnerke. After reading the journal through most carefully, we came to the conclusion that photography must be flourishing to be able to support a monthly of fifty pages of literary matter, besides two full-page half-tone illustrations. It is published in Mockba or Moscow, and edited by Pierre Preobrajensky.

Some New Ideas on Lenses.—In the *Photographisches Archiv*, Professor Zenger points out the possibility of making anastigmatic-apochromatic lenses with far fewer elements than are at present employed in some of the newer lenses; in fact, that they may be constructed of two glasses only, and "it is possible to correct all the faults of the single lens, such as chromatic and spherical aberrations, distortion, and astigmatism with two lenses of different refractive glass, by suitable choice of curve and substance, as in the human eye, and thus to obtain a higher degree of apochromatism than can be obtained by use of the newest of the Jena glasses." As the Professor points out, such lenses should be much cheaper than the best lenses of the present day, whilst being equally good in working powers. His final conclusion seems to point to a construction of plano-convex and plano-concave lenses, as in the Concentric.

The Wave-length of Light as a Unit of Measure of Length.—Two assistants of the Smithsonian Institute, Michelson and Morley, have been experimenting in conjunction with M. Benoit.

in Paris, to determine, if possible, the length of the standard metre by means of the wave-length of monochromatic light. Their first attempts with the well-known sodium or D lines showed that these were not sufficiently monochromatic, but that the red cadmium line was. After several months' work, the mean of two absolutely independent experiments proved that the length of the standard metre was 1,553,163·5 wave-lengths.

The Use of Urea in Gelatino-bromide Emulsions.—M. Pierre Scheers contributes to the current issue of the *Bulletin Belge* an article describing his experiments with urea as an addition to bromide emulsions. He points out that the fineness of grain of the silver bromide is dependent on several factors, such as, the concentrations of the solutions, the quantity of the gelatine, the degree of heat, and the method of precipitation. A fine-grained but slow emulsion usually appears of a deep yellow by transmitted light, and it is desirable to transform this colour into blue or violet, which transformation is usually accompanied by an increase of grain. The transformation or ripening is usually effected by heat, or ammonia, both methods having considerable disadvantages, which do not accompany the use of urea, which is slowly decomposed into ammonia and carbonic acid. A definite quantity of urea—which, by the bye, is not stated by the author—is added to the emulsion, together with the ferment necessary to produce this decomposition. This ferment is obtained from urine allowed to stand and ferment, and, by the addition of alcohol, some substance, assumed to be of the nature of diastose, is precipitated, which can be filtered out and kept in a bottle, and mixed in small quantities with the urea before adding to the emulsion. This, it is said, produces an extremely fine-grained, rapid emulsion.

Relative Permanence of Prints.—Vogel classifies the various printing methods, according to their permanency, as follows:—(1) Prints on gelatino and collodio-chloride paper, toned in a combined bath, fade very quickly; (2) the same papers and albumenised, treated with separate baths, keep better; (3) developed silver prints are still more permanent; and (4) the carbon process gives prints which are chemically inalterable; whilst (5) the most durable prints of all are given by the platinotype process.

Acetylene.—Le Roy states that a kilogramme of calcium carbide yields 355 litres of acetylene, and that this gas possesses an illuminating power fifteen times greater than ordinary gas. He makes it in a steel bottle, enamelled inside, some calcium carbide being placed in a leaden vessel in the bottle, and the necessary quantity of water is also enclosed in a thin glass tube; the bottle is closed, the water tube broken by shaking, and the acetylene thus generated compresses itself. To obviate any danger from the heat evolved, the bottle is placed in cold water and the quantity of calcium carbide carefully calculated. A Wiesnegg's Bunsen burner is used, and, if oxygen instead of air is used with the acetylene, a much more brilliant light is obtained—in fact, stronger than the limelight.

Destruction of the Latent Image.—In continuation of his experiments on Lippmann's process of heliochromy, Dr. Neuhuss finds that, if the exposed plate is left for three days in contact with the mercury, the latent image is destroyed, and that, if the plate had stood in contact with the mercury for an hour and was then kept in the dark for four days, no image could be developed.

Two new Actinometers.—C. Conquerant of Paris has introduced two new exposure meters which consist of wedges of smoked glass; one is used in contact with the ground glass of the camera and, is therefore much on the same principle as Decoudun's, and obviously gauges the exposure by the visual rays; the other is used in contact with a piece of thin porcelain or opal, and is used to measure the amount of contrast in the subject as a guide to development.

Lactate of Silver Plates.—Guilleminot of Paris has introduced lantern plates prepared with silver lactate, which with a metol carbonate developer are said to give excellent results as regards vigour, clearness, and tones. The light-sensitiveness of silver lactate was discovered by Pelouze and Guy-Lussac in 1833, and it was used by Cooper in collodion emulsion (The British Journal of Photography, 1871, p. 187). In printing out, its sensitiveness is stated by Marktanner-Turneretscher to be eighteen as compared with 100 for silver chloride.

Three-colour Printing.—As light filters or screens for three-colour work, the following solutions are recommended, but the value of the same is doubtful, in that neither the plates nor thickness of solution are indicated.

For the violet screen,

Concentrated cupric chloride solution	7 parts.
Distilled water	17 „
Ammonia	5 „

Filter and add

Concentrated solution of methyl-violet B ..	3 parts.
Concentrated solution of fuchsin S.	5 „

For the orange screen,

Concentrated solution of cobalt chloride	15 parts.
Distilled water	35 „
5 per cent. solution of ammonium bichromate	25 „
Ammonia .....2 to 3	„

Filter before use.

For the green screen

Solution of nickel sulphate.

These formulæ are somewhat on a par with those given by a contemporary where we are told to "dissolve a bit of resin the size of a hazel nut."

OAKLEY'S ANTIHALATION SUBSTRATUM.

Mr. C. F. Oakley, in describing his improvements in the manufacture of photographic plates and films, says that for the purpose of preventing halation it has been proposed at various times during the last six or eight years to coat the glass plate, film, or other support for the sensitive emulsion with a layer or substratum below the sensitive emulsion, this layer or substratum containing a colouring matter which renders it non-actinic, the said colouring matter subsequently disappearing during the development or fixing. But these coloured substrata have failed to answer in practice, because the colouring matters which they contain are of such a nature that they become, to a great extent, taken up by the superposed coating of emulsion, the sensitiveness of which is consequently seriously impaired and sometimes practically destroyed.

It has also been proposed, with the object of preventing halation, to coat the glass plates, or other supports, with two or more coats of emulsion of graduated degrees of sensitiveness.

"Now, the object of my invention is to cover the glass plate, or other support, with a layer or substratum coloured with such a material and in such a manner that the colouring matter will not be subsequently taken up by the sensitive emulsion applied to the plate over the substratum, the sensitiveness of the emulsion therefore not being affected.

"My invention consists in the manufacture of photographic plates and films by first coating the glass plate, or other support, with a solution of gelatine or other suitable non-sensitive material, then immersing the plate, preferably when dry, for a sufficient length of time, say from two to five minutes, more or less, in a colouring and hardening solution, then, after washing the plate and allowing it to dry, coating it with a sensitive emulsion. The coating of sensitive emulsion should be allowed to dry in a dark room. The colouring and hardening solution must be one that will not only colour the layer of gelatine and render it non-actinic by entering into the substance of same, but also produce a reaction which has the effect of oxidising and hardening the gelatine, and rendering it practically insoluble. Consequently the colouring matter is prevented from being taken up by the sensitive emulsion subsequently applied. The solution preferably employed for the purpose is permanganate of potass, and a suitable strength is obtained by adding about one ounce of the permanganate to one gallon of water.

"The colour in the non-sensitive substratum disappears during the development when developers such as hydroquinone are employed, or in the fixing bath when this contains sulphite of soda and acid."

WELLINGTON'S IMPROVEMENTS IN THE MANUFACTURE OF STRIPPING FILMS.

Mr. J. B. B. Wellington, in describing his improvements in the manufacture of stripping films, says the invention has for its purpose to provide a film of gelatine, which is supported during exposure upon a backing of paper, cardboard, or the like, from which backing it is stripped prior to the process of printing.

Hitherto stripping films have been formed by interposing between an insoluble gelatine and a paper backing a layer of soluble gelatine, which was, after development and prior to the process of printing, dissolved by means of hot water, thus releasing the negative from its temporary support. In films of this class the insoluble gelatine was so thin that it was necessary to transfer it to another permanent transparent support, this transference forming a necessary part of the process. Stripping films of this kind were found to be unsatisfactory in various respects, and the process is now no longer to be met with in practice.

"In stripping films manufactured according to my invention the disadvantages hitherto obtaining are overcome. The stripping is effected without the use of hot baths or special treatment of any kind, and it is not necessary to transfer the stripped film to any other support

"In carrying my invention into effect I coat upon one or both sides of any suitable paper, as, for instance, upon the well-known photographic papers, and also those coated with baryta, whether matt or calendered, a substratum containing a suitable proportion of any gum or resin dissolved in any of the well-known solvents which are in general use for this purpose. In practice I have found that good results may be obtained with mastic, and this in varying proportions, or with other gums and resins, as, for instance, damar, copal, and their congeners, but I prefer to use gum sandarac or gum copal. The thickness of the solution of these gums is, in like manner, capable of considerable variation, and will depend in great measure upon the means which are adopted for coating the paper. For instance, if the paper be coated by immersion in a trough, a solution of one part of gum sandarac or gum copal and ten parts of methylated spirit or other solvent will be found to answer well. The gum solution may, if desired, be stained with some non-actinic colour in order to prevent the transmission of light through the film and to diminish halation.

"Having thus prepared my paper backing by coating it with a substratum of gum, and permitted it to dry, I proceed to coat thereupon the layer of gelatine which is destined to form the body of the film itself. This body I form of gelatine, which I preferably render insoluble by the addition thereto, immediately prior to coating, of a suitable proportion of soda alum, chrome alum, or any of those well-known chemicals which have the property of rendering gelatine insoluble when dry. I coat the gelatine upon the gummed paper backing in sufficient thickness to give me, when dried and stripped from the gummed paper, a film of sufficient substance to serve as the support of a negative. In practice, I prefer to make the gelatine so thick that the resulting film, together with the emulsion spread upon it, measures from 2000ths to 10,000ths of an inch in thickness when dry, in order that it may not be necessary to transfer the film to another support. If it be desired, the paper backing may be coated with the gelatine upon both sides, the coating upon the back in such case having for its purpose to prevent the warping and cockling of the entire support through change of temperature and hygrometric conditions. When the gelatine is dry, I coat upon it the sensitive emulsion in the manner well known to those skilled in the art. This process completes the manufacture of the film.

"If desired, the silver salts may be emulsified with the gelatine used to form the body film, in which case the body film and sensitive surface are produced at one and the same operation, thus avoiding the loss of time involved in the double process and the intermediate drying operation.

"I expose my improved film while still in contact with the backing of gummed paper upon which it is formed, this backing giving body and rigidity to the film, which is advantageous. In like manner I preferably effect the process of development, fixing, and washing upon the paper backing. When the washing is complete, or at any stage of the process after exposure of the film, I separate or strip the body film of gelatine, together with the emulsion coating upon it, by pulling off the backing of gummed paper, the function of the gummed substratum, in which lies the essence of my invention, being to facilitate the stripping process. Having thus separated the negative with its permanent support, I preferably squeegee this upon a ferrotype plate, sheet of glass polished by means of French chalk, or talc, or with wax, or other similar plane and polished surface, upon which it is permitted to dry, and from which it derives a flat and polished surface. The negative may be squeegeed with either surface in contact with the polished plate. Should it be desired to remove any grain or matt appearance of the paper backing which may appear upon the gelatine body, this side may be placed for this purpose in contact with the polished plate. When the negative becomes thoroughly dry, it is peeled from the polished surface, and is then ready for printing."

NOTES FROM THE WEST OF SCOTLAND.

In Glasgow considerable interest has recently been taken in the utilising of house gas for the purpose of lighting studios for portraiture. On the invitation of Mr. Verel, of the Albion Albumenising Company during the last ten days or so, quite a large number of professional photographers in and around Glasgow have had an opportunity of inspecting and working a new lamp specially designed for portraiture; the gas burners are on the incandescent principle, but there seems to be a distinct improvement in the quality of the light over the earlier forms of such a method of lighting; this may probably be caused by an improved mantle or shield which we understand has been adapted to the lamp; in any case a beautifully pure white light is provided, the mantles of the burners diffusing the light in a most effective manner.

The arrangements for altering the elevations and position of the lamp are simplicity itself, the slightest touch being sufficient to raise or lower the illuminating portions into any desired position.

In candle power, we should say that the lamp, when burning at its best, with a full supply of gas, is considerably over a thousand candle power, but even with this there is no overheating of the studio, and it is claimed that the cost of working the same does not exceed a few pence per hour.

We had the pleasure of making a few exposures with the aid of the new lamp, and were surprised at the shortness of time needed, a few seconds only being required to yield excellent negatives.

Much satisfaction has been expressed by those who have had an opportunity of inspecting and working the new lamp, and it would appear as if a distinct advance had been made in the direction of artificial lighting of studios by means of house gas.

The prospects of Glasgow having another International Exhibition in 1897 continue to brighten every day, and before long it is probable that a committee will be formed to further the scheme.

The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

ACETYLENE GENERATOR (To MR. THOMPSON).—"The acetylene generator I described was simply an old oxygen generator apparatus which I had had by me for years, and was utilised for this purpose by suspending in it the flower pot to hold the C_2C_2. A diagram would not make it any clearer, and I do not claim it as the best form possible if you are going to construct one specially."—E. BANKS.

COLLODION EMULSION (To MR. J. HAMPTON).—"In an article subsequent to the one Mr. Hampton has been working from, I pointed out that with many samples of the new methylated spirit an organic salt of silver and chromium was found, and which was not discharged by the cadmium bromide. The simplest plan in that case is to add the bromide first, until all the free nitrate of silver is converted into bromide, and then add a drop of saturated solution of bichrome. The emulsion should be pure white or nearly so, and not grey."—E. BANKS.

ACETYLENE (To E. W. B.)—"I wrote of acetylene not as a possible rival to ordinary gas, but as a pure, brilliant, and very actinic light for photographic purposes, and which was so safely and easily produced with simple appliances. For this purpose, ordinary gas is not in it, and even the incandescent gas is not equal to acetylene, on account of its large area of flame. If you place a stop, say of $\frac{3}{4}$ inch diameter, before the incandescent gas, and also the acetylene, the difference is much in favour of the latter."—E. BANKS.

Our Editorial Table.

RECEIVED:—THE NEW LIGHT (a series of illustrated articles descriptive of experiments with the X rays), and TABLES OF CONJUGATE FOCI, by J. R. Gotz (Second Edition). Both these are published by Messrs. Dawbarn & Ward, Farringdon-avenue, E.C.

THOMAS'S A1 PLATES.

R. W. Thomas & Co., Thornton Heath.

THIS is a new plate, claimed by the makers to possess extreme fineness of grain with great speed. We readily testify to the fact that both claims are well grounded, our trials of the plates fully substantiating them. In the present demand for plates of extreme rapidity, the A1 plates should achieve marked popularity. Not only are the A1 plates very rapid, and fine in grain, but they resist fog in development to a notable degree — a point upon which many modern makers of extremely rapid plates are to be congratulated. We developed the A1 plates with Thomas's Universal developer—an

excellent developer—in one solution, which we can highly recommend. The following pyro-ammonia developer is also given by the makers :—

PYRO STOCK SOLUTION.

Sodium sulphite	3 ounces.
Ammonium bromide	½ ounce.
Citric acid	¼ „
To be dissolved in boiling water made up to	10 ounces.
When quite cold add pyrogallic acid	1 ounce.

AMMONIA STOCK SOLUTION.

Liquor ammoniæ ·880	1 ounce.
Distilled or boiled water to make	10 ounces.

(The above solutions will keep good for a long time if well stoppered.)

No. 1 SOLUTION.

Pyro stock solution	2 ounces.
Water to make	20 „

No. 2 SOLUTION.

Ammonia stock solution	2 ounces.
Water to make	20 „

For *normal* exposures use equal parts of Nos. 1 and 2; for under-exposure increase the No. 2; for over-exposure reduce the quantity of No. 2 solution.

For the convenience of those who wish to make up small quantities the following instructions are given :—

Pyro stock solution	1 drachm.
Ammonia stock solution	1 „
Water	2½ ounces.

To be modified for under or over-exposure as above directed.

News and Notes.

MR. THOMAS H. KING, M.P.S., of the Amersham Pharmacy, Market-square, Amersham, writes: "Kindly intimate that I have a dark room for use of visitors."

A CENTRAL NEWS telegram states that Mr. Thomas A. Edison is at present specially devoting himself to work with Professor Röntgen's light, and will shortly attempt to photograph the human brain.

MR. T. A. SCOTTON, Hon. Secretary of the Derby Photographic Society, writes: "Will you kindly inform your readers that I have removed from 9, Church-street, to 11, Pear Tree-road, Derby, and oblige."

WE are informed that the Marquess of Londonderry has consented to open the Exhibition of the South London Photographic Society, to be held at the Public Baths, Church-street, Camberwell, on March 2, 1896, at seven p.m. The Exhibition will continue open for the remainder of the week.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock, on Wednesday evening, February 19. Mr. E. J. Wall will read a paper, entitled *The Composition of the Negative Image and its Relation to Speed Readings and Printing Qualities.*

MR. J. EPSTEIN, of 33, Broad-street, Bristol, has received an intimation that the highest award has been granted to him of a silver medal for his show of picture-frame mouldings and mounts at the National Trades and Industrial Exhibition held at Glasgow. This makes four silver medals within the last two years Mr. Epstein has received.

AN ALARM OF FIRE.—An alarm of fire, which, fortunately, proved groundless, occurred in Bournemouth last week. The South Coast Photographic Supply Association have recently introduced a very powerful flashlight for the purposes of photographic enlarging and copying. On the occasion of its first being put into use, the flash was so vivid and so unlike anything seen in the neighbourhood before that the brigade were immediately called out, and in less than five minutes uniformed and helmeted firemen were on the premises, only to find that their services were not required.

ACETYLENE EXPLOSION AND FIRE.—In New Haven, Conn., January 21, an explosion and fire occurred, by which three men were killed and a building destroyed, on account of experiments with acetylene, the exact nature of which and the especial cause of the accident cannot be accurately determined, as the apparatus was wrecked, several of the participants badly burned, and one killed. On the third floor of a four-story brick building was the shop of Frank P. Phlegar, a machine jobber, who was said to be experimenting upon a regulator to control the delivery of gas from steel cylinders, about six inches in diameter by four feet long, in which liquefied acetylene was kept, the pressure of which, at 66° to 70° Fahr., according to Lewes and Shuckert, would be about 600 pounds per square inch. It was known that, when the explosion occurred, seven men were standing about the apparatus, of whom one was killed, and all the others badly burned and injured. A second explosion soon followed the first, the surrounding structures being badly shaken up, and flames enveloping the building, which was so quickly destroyed by the fire that two other occupants were burned to death.

UNDER the chairmanship of the President (Mr. Leslie Selby), the annual dinner of the West London Photographic Society was held last Friday at the Frascati Restaurant. The toast list included "Success to the West London Photographic Society," admirably given by Mr. W. A. Brown; "The Officers," for which Mr. James Stein (Hon. Secretary) replied; "The Visitors," given by Mr. Wilson, and responded to by Mr. Bolding; "The Chairman," proposed by Mr. Lamley. An enjoyable musical entertainment and a capital dinner contributed to the pleasure of the members and their guests.

CAMERA-PROOF DRESSES.—A facetious writer, referring to the new photography, says: "It is said that the ordinary feminine wearing apparel will be powerless to prevent the camera from taking any picture the operator chooses, and, if the principle is carried out in snap-shot cameras, we may expect all sorts of awkward complications." The same writer has been told that the only material which will baffle the camera of the future is satin, so that ladies "who wish to preserve a certain degree of privacy in their walks abroad will do well to provide themselves with a complete suit of armour manufactured of satin." Further, the writer goes on to say that he has already heard of several dresses being described as "camera-proof."

FOR the purpose of rendering material assistance to a very old photographer (Mr. Henry Reynolds) at a time of serious illness, a smoking concert is to be held at the Champion Hotel, Aldersgate-street, on Friday, March 6. Mr. Reynolds has had a long and honourable association with photography. In the year 1860 he accompanied Mr. Warren de la Rue to Spain for the purpose of taking a series of views of the total solar eclipse, on July 18, at Rivabellosa, near Miranda de Ebro. The party also included Mr. Beckley, of Kew Observatory, Mr. Downes, and Mr. E. Beck. The extraordinary results then obtained formed the subject of Mr. Warren de la Rue's Bakerian Lecture, read April 10, 1862. He photographed the first contingent of invalid troops arriving from the Crimea, and was engaged in making the first series of views of the Abbeys of Yorkshire for the then eminent firm of Messrs. De la Motte & Cundall, subsequently the views of the Manchester Fine Art Exhibition of 1857, and, for the late Mr. Francis Bedford, his series of North and South Wales, Warwickshire, Gloucestershire, &c. Next went to Spain with Mr. Warren de la Rue, the astronomer, to do the photographic work of the eclipse, sun spots (enlarged) and lunar observations, at his observatory, as also spectroscopic work to determine red flames. Later proceeded to India, Nicobar Islands. He had the training of officers at Greenwich Observatory for the transit of Venus, assisting Mr. De la Rue in his researches in electricity with vacuum tubes, and more recently with the London Stereoscopic Company, and working in the British Museum, photographing antiquities, the Portland vase, Elgin marbles, &c. The Hon. Secretary of the concert is Mr. S. Clark, London Stereoscopic Company, 54, Cheapside, and he will be happy to supply tickets, which are 1*s.* each.

THE Annual Exhibition of Lantern Slides, under the auspices of the Leeds Photographic Society, was given on Thursday evening, the 6th inst., in the Albert Hall, and attracted a large attendance. About 220 slides were shown by the electric light. The Exhibition represented the work of the following members of the Society: Messrs. G. Bingley, J. H. Walker, A. Naylor, H. P. Atkinson, J. A. Moxon, J Taylor, A. Nicholson, C. H. R Pickard, Thomas Butterworth, H. C. Watson, A. C. Beilby, A. W. Atkinson, and Miss S. Cliff. The description of the views, all of which were very beautiful, and were much appreciated, was given by Mr. G. Bingley. In the early part of the Exhibition a number of slides, illustrating the new photography, prepared by Mr. F. W. Branson, were shown, as well as a slide showing the skeleton of the hand seen through the flesh, prepared by Mr. C. Swinton, of London, kindly lent for the occasion by Mr. B. A. Burrell. The slides represented several parts of Great Britain, the chief contributor being Mr. Godfrey Bingley, who conducted us first into Scotland, and, in the second part of the programme, into the Lake District, explaining, as he went along, many objects of geological interest. Mr. J. H. Walker's slides were, many of them, of architectural and historical interest. A batch of athletic subjects was shown by Mr. Moxon, flower studies by A. C. Beilby, and several figure transparencies by the remainder of the exhibitors, Mr. James Taylor showing, in addition, excellent work done in Jersey. Mr. Bingley announced that Mr. Branson had arranged, under the auspices of the Leeds Photographic Society, to give a lecture, with practical demonstrations, on the new photography in the Philosophical Hall, on Friday, the 14th inst. It was also announced that the Photographic Convention of the United Kingdom will hold its annual meetings in Leeds from July 13 to July 18. The Society were again indebted to Mr. F. J. Borland for making the electric arc light, and to Mr. A. A. Pearson for assistance with the lantern.

Patent News.

THE following applications for Patents were made between January 27 and February 1, 1896 :—

CAMERAS.—No. 1891. "Improvements in Cameras and Accessories therefor." C. E. PECZENIK.

CAMERAS.—No. 1907. "Improvements in Photographic Cameras." E. H. P. HUMPHREYS.

PHOTOGRAPH FRAMES.—No. 1916. "Improvement in Frames for inserting Photographs, Pictures, Prints, and alike therein." G. BUTES.

HAND CAMERAS.—No. 1933. "Improvements in Magazine Cameras with Screen Focussing Arrangement." J. W. SMITH and F. EVELEIGH.

SQUEEGEE ROLLER.—No. 1945. "An Improved Squeegee Roller for Photographic Mounting." J. HARKNESS.

CAMERAS.—No. 1957. "Improvements in or connected with Photographic Cameras." T. P. BROWN.

CAMERA STAND.—No. 1964. "Portable Camera Stand and Cycle Attachment." J. RUSSELL.

CAMERAS.—No. 2016. "Improvements connected with Photographic Cameras." D. H. T. PEPLOE.

DARK ROOMS.—No. 2117. "Improvements in or appertaining to Dark Chambers for Photographic Purposes." Communicated by H. Hofmann. G. C. DYMOND.

DEVELOPING TRAY.—No. 2165. "An Improved Tray or Dish for Photographic or other Purposes." J. AIRS.

PHOTO-MECHANICAL WORK.—No. 2359. "Improvements in or relating to Photo-mechanical Reproductions." C. F. E. FENSKE.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

February.	Name of Society.	Subject
17	Leeds Photo. Society	*Stereoscopy.* W. I. Chadwick.
17	North Middlesex	*Development.* H. Smith.
17	Richmond	*Carbon Printing.* The Autotype Company.
17	South London	*Mounting and Framing.* J.C.S.Mummery.
18	Birmingham Photo. Society	Conversazione.
18	Brixton and Clapham	*Stereoscopic Photography.* J. Gunston.
18	Gospel Oak	*Exposure.* A. E. Morton.
18	Hackney	*A Day on Dartmoor.* G. J. Avent.
18	North Surrey	Making of Enlargements Practically Demonstrated. A. Downes.
19	Ashton-under-Lyne	*A Visit to a Spanish Bull Fight.* J. T. Lees.
19	Borough Polytechnic	Lantern-slide Making by Members.
19	Croydon Camera Club	Lantern Night.
19	Leytonstone	*How to Make Lantern Slides by Reduction.* C. A. Russell.
19	Photographic Club	*The Composition of the Negative Image and its Relations to Speed-readings and Printing Qualities.* E. J. Wall.
19	Southport	Query Night.
20	Bradford	Prize Slides.
20	Ealing	*Composition: Different Methods of Retouching.* J. T. Fairs.
20	Leeds Camera Club	*Photo-ceramics.* P. Elliff.
20	Liverpool Amateur	Demonstration on Platinum Toning of Gelatino-chloride Paper. Dr. J. W. Ellis.
20	London and Provincial	*The Kinetoscope.* Birt Acres.
20	Oldham	*Printing and Toning.* J. Brooks.
21	Birkenhead Photo. Asso.	Demonstration.
21	Croydon Microscopical	Demonstration of Anti-halation Plates. C. F. Oakley.

ROYAL PHOTOGRAPHIC SOCIETY.

FEBRUARY 11,—Annual Meeting,—Captain W. de W. Abney, C.B., in the chair.

The nominations of four new members were read, six new members were elected, and it was announced that the following had been admitted as Fellows:—Messrs. F. W. Edwards, Hall Edwards, J. H. Coath, Court Cole, and C. E. Hearson.

THE PROGRESS MEDAL.

The CHAIRMAN, in presenting the progress medal to Mr. T. R. Dallmeyer for his invention of the tele-photographic lens, said this medal was one of those distinctions which it was the aim of all who were working in the best interests of photography to gain, and in all the list of those who had already obtained it no one had secured it more honourably or by greater skill than the present recipient, who had placed in the hands of scientific men a remarkable new power which would, doubtless, in the future, bring forth fruit to the advantage both of science and of art.

Mr. T. R. DALLMEYER suitably acknowledged the presentation.

THE ANNUAL REPORT.

The Annual Report of the Council, together with the balance-sheet, was taken as read.

The report and balance-sheet were adopted without discussion, and, upon the motion of Mr. F. W. Hindley, a vote of thanks was passed to the President, the Council, the Auditors, and the Scrutineers.

Mr. J. W. WILSON then read the report of the Scrutineers, from which it appeared that the result of the voting for the new Council was as follows:—*President:* Captain W. de W. Abney, C.B., R.E., &c.—*Vice-Presidents:* The Earl of Crawford, Sir Henry Trueman Wood, M.A., and Messrs. H. Chapman Jones and T. R. Dallmeyer.—*Council:* Messrs. Thomas Bedding, Thomas Bolas, F. A. Bridge, James Cadett, F. P. Cembrano, jun., E Clifton, A. Cowan, W. E. Debenham, W. England, Colonel J. Gale, T. C. Hepworth, F. Hollyer, A. Mackie, J. A. Sinclair, J. Spiller, J. W. Swan, E. J. Wall, L. Warnerke, Paul L. Waterlow, and Horace Wilmer.—*Treasurer:* Mr. G. Scamell.

THE NEW SHADOW PHOTOGRAPHY.

The PRESIDENT, at the conclusion of the formal business of the Annual Meeting, called upon Mr. A. A. Campbell Swinton, who had promised to make a communication, with experimental illustrations, upon this subject, remarking that he objected to the use of the word "photography" in that connexion, and would prefer to use the term "shadow electrography."

Mr. SWINTON said at the outset that he was not a photographer, but an electrician, and that was probably the reason why he was present, for the difficulties attendant upon "the new photography" were chiefly electrical difficulties, and he therefore proposed to confine himself more especially to the electrical side of the question. He first showed the sparking of a Rhumkorff induction coil, then the same spark in a glass bulb, and afterwards the difference in the effect when the air had been exhausted from the bulb, the spark then appearing as two luminous rings. For the purpose under consideration, he said, it was necessary to employ tubes with far higher vacua than the ordinary Geissler's tubes, of which he showed several specimens. The difference between a Geissler's tube and a Crookes' radiant matter tube was, that, whereas in the former the luminosity was due to the gas contained in the tube, and took place throughout the whole of the tube, in the latter the luminosity was due to the cathode rays, and took place, not throughout the residual gas, but only at certain points, a peculiar point about these cathode rays being that they could be deflected by a magnet, which was a strong argument in favour of their being electrified particles of matter. One of the peculiarities of the Röntgen rays was, that they were unaffected by a magnet after leaving the glass, and this had also been determined by Professor Oliver Lodge, and they were incapable of reflection except to a very small degree. For producing photographic images by means of these radiations, it was very important to use tubes of the right description, and this depended to some extent upon the source of energy that was employed. If suitable tubes could be obtained, he thought the Tesla coil would yield the best results, as with it the exposure could be largely reduced. He had been inundated with inquiries as to where the necessary apparatus could be obtained, and therefore mentioned that suitable tubes were sold by A. E. Cossor, 67, Farringdon-road, H. Henderson, 70, Finsbury-pavement, and Poths, 3, Creechurch-lane, Leadenhall-street. Mr. Swinton then demonstrated the process. Six dry plates cut to lantern size were placed on the table, each being contained in a double envelope of black paper, and upon them were laid purses, pencils, and other small articles, at a distance of about eight inches from the bottom of the tube. An exposure was given of three minutes, by illuminating the tube for twelve periods of fifteen seconds with fifteen seconds' rest between each to prevent overheating and fracture of the glass, and the results upon development were shown in the lantern, and were in every case quite successful. An attempt was also made to obtain a "shadowgraph" of the hand of Mr. Fred Marsh, a Fellow of the Society, one of whose fingers had been crushed, but for some reason which was not explained this was unsuccessful. Mr. Swinton concluded his demonstration by saying that he and his colleague, Mr. Stanton, had been devoting their attention specially to the reduction of the necessary period of exposure, as, if the discovery was to be of any use in medicine and surgery, it was of the greatest importance that the exposure should be short, and he showed a representation of a human foot which had been secured in fifty-five seconds.

A large number of examples were exhibited by Mr. Swinton and Mr. Gifford, as also a series of new lantern slides by Messrs. Newton.

Mr. J. W. GIFFORD said that, in the course of his experiments, he exposed without pausing, giving a continuous exposure, and had not broken any tubes. He had experimented with an aluminium window to the tube, and found the advantage over glass was so small that it was not worth while to take the trouble and risk of making an aluminium tube, as had been suggested. He asked whether Mr. Swinton had noticed any difference between rapid and slow plates in this connexion. In his own case he found that there was no apparent difference in the time of exposure, whether the plates were "rapid" or "slow," and comparatively slow plates gave more plucky negatives.

Mr. SWINTON had only used two kinds of plates, and those not in such a manner as to form any opinion as to their speed.

Mr. SEBASTIAN DAVIS suggested that, for making these investigations, plates should be specially prepared, so that there might be definite knowledge as to their composition.

Mr. GIFFORD thought that no one had yet photographed the human head by the Röntgen rays, and, as a great deal had lately been said upon the subject, he had, as an experiment, attempted to obtain a photograph of the contents of an incubated egg, and he exhibited the result. The network of blood vessels was dimly discernible, but there was nothing else, and, as the human brain was surrounded by a bony envelope, he did not think it could be photographed. He had observed one effect which he was quite unable to explain, a piece of brass tube was placed in contact with a plate, and produced a white place on the negative, but, when the tube was outside the plate box, and not in contact with the film, a black ring resulted. This seemed to point to some sort of attraction of the rays by the tube, or to a reflection from its sides.

Dr. GLOVER LYON said it had occurred to him that, as the microbes of disease were killed by sunlight, they might possibly be killed by the Röntgen rays, and he had made experiments in that direction. It was a very fascinating idea that the germs of consumption might be killed without touching the body at all, by simply throwing germicidal rays into the interior of the patient. With a Tesla apparatus he had operated upon a cultivation of diphtheria microbes for twelve hours, but they grew as fast as ever, and he was sorry to say he had no result at all. But he did not regard this as the end of the subject, for he thought it quite possible that, with higher power than he had used, something more satisfactory might be obtained. He had found that rapid plates gave better results than slower plates, exposures being equal.

Mr. W. E. DEBENHAM suggested that, in order to obviate the necessity for "resting" the tube during exposure, duplicate tubes should be utilised, being alternately brought into position and illuminated for a short time, the exposure thus being continuous.

Mr. SWINTON thought this a very good idea.

The EARL OF CRAWFORD asked whether any experiments had been made in which the sensitive film was spread upon a support which would not fluoresce?

The ASSISTANT SECRETARY said he had tried ferrotype plates coated with a rapid collodion emulsion, but had been unable to obtain any results whatever.

Mr. SWINTON remarked that it had been suggested that, if the plate were heated, so as to increase the fluorescence, the exposure might be reduced very greatly, but he and Mr. Stanton had been unable to produce the slightest difference by this means.

A vote of thanks having been accorded to Mr. Swinton, the proceedings terminated, but a large number of members and visitors remained to witness a

further demonstration of the process and to examine the apparatus employed. The meeting was a "record" one, the Society's room being inconveniently crowded during the whole of the evening.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 6,—Mr. H. C. Rapson in the chair.

EXHIBITION OF PICTURES.

The HON. SECRETARY drew attention to the exhibition of pictures kindly provided and arranged in the room by Mr. W. D. Welford, with the aid of Mr. Fortune.

Mr. W. D. WELFORD, in introducing the exhibition of pictures by American and foreign workers, said he had a bureau scheme in operation, in which he acted as an agent for a number of foreign exhibitors, sending their pictures to the various exhibitions, and generally looking after their interests, and was thereby enabled to provide the present display. He thought it was to some extent a novelty and a welcome change in the ordinary routine of society meetings. In an hotel, where it is often impossible to obtain previous possession of the meeting room, except for a short time, he found that some arrangement for the rapid hanging of the pictures was a necessity, and, in conjunction with Mr. C. E. Fortune, he had constructed a series of screens, made of light wood, so as to be portable. These are joined in pairs after the system of clothes-horses, and made rigid by a cross piece at the back, and provide a convenient hanging space about sixty-four feet long. Upon these frames were hung the photographs, numbering in all about 120, of which one-third were framed and the rest simply mounted. Some idea of the rapidity of arrangement may be gleaned from the fact that at 7.15 the room's condition was normal, and at 8 o'clock all four sides were hung with photographs, titled, &c. Mr. Welford thought the members would agree that an examination of the pictures would give evidence that some attempts had been made beyond simply reproducing a transcript of what was before them, and showed careful study of the subject. The exhibitors included many well-known names from America, and Canada, Spain, Germany, and Austria were also represented.

The HON. SECRETARY proposed a hearty vote of thanks to both Mr. Welford and Mr. Fortune for the evening they had given the members, which was seconded by Mr. J. E. HODD and carried *nem. con.*, and these gentlemen briefly replied.

HALOGENS.

A question from the box was read: "Why are halogens so called?"

Mr. W. E. DEBENHAM, speaking from memory, said the word was derived from the Greek, *hals*, meaning sea salt, and was also applied to bromine, iodine, &c., on account of their tendency to produce salts similar in composition to sea salts.

CONTRAST IN DEVELOPMENT.

The HON. SECRETARY, referring to the competition arranged between Mr. Welford and Mr. A. E. Smith, said the plates he exposed were two of Marion's portrait plates. The subject selected he thought was pretty equal on both halves of the plate, and constituted a very fair test subject. The results were passed round.

Mr. WELFORD detailed his mode of development. One was done with ordinary washing soda and dry pyro, and the second with carbonate of soda and dry pyro, in both cases there being an entire absence of any restrainer beyond that peculiar to the soda. His object in the competition had been simply to prove that the yellow negative gave a more brilliant print than the blue-toned negative.

Mr. DEBENHAM would have liked to have seen clearer shadows in both pairs, and suggested that the plates had been fogged.

The HON. SECRETARY stated that, as each competitor had received the right-hand half of one and the left of the other, and there was no fog on the rebate of Mr. Welford's plates, that was out of the question as far as he was concerned, although Mr. Smith might have fogged his subsequently. He thought there was no silver in the yellow stain, and that it was due to the developer, and not to the silver in the plate.

Mr. A. E. SMITH had used the Ilford Universal developer, with the addition in the case of one of two grains of bromide to the ounce extra, the result appearing to be very much over-exposed. In the second case four grains of bromide obtained one somewhat clearer. He did not think the plates had been fogged by his lamp. Development was complete in about four minutes.

Mr. DEBENHAM, in answer to the Secretary, said his grounds for saying the plates had been over-exposed was that certain sash bars were entirely lost in one case. The fact that, with four grains additional bromide in one of Mr. Smith's trials, the plate developed in four minutes pointed to over-exposure, in his opinion.

Mr. WELFORD thought the question of over-exposure entirely answered by his negatives, with which no restrainer was used and no precaution taken. The stain on the edges was in due proportion to that on the rest of the plate.

Mr. BAYSTON inquired as to the temperature of the solutions, and it was ascertained that Mr. Smith's were rather warm, while Mr. Welford's were quite cold, which was conducive to contrast.

Mr. R. A. HODD had always found Marion's portrait plate fog very much with hydroquinone, but not so with pyro.

The CHAIRMAN thought that certain wire gauze would have been lost in the event of over-exposure.

Mr. TEAPE considered that, on account of the fog in the plates developed with hydroquinone, nothing like a comparison could be attempted between the two developers, and suggested that the trials be repeated.

Mr. WELFORD, although not wishing any one to think he was desirous of resting on his laurels, could not undertake to continue the contest, and the matter dropped.

Brixton and Clapham Camera Club.—February 4, Mr. W. Fraser (Vice-President) in the chair.—This was a Lantern Evening, a series of slides,

THE ANTIQUITIES AND HISTORICAL BUILDINGS OF ESSEX,

more particularly of Colchester and its neighbourhood, being shown by Mr. George Biddell, who gave a very entertaining and instructive description of the subjects illustrated, and, in conclusion, urged upon his audience the desirability of devoting their attention to one special branch of photography, thus obtaining, in the course of a year or two, a collection of photographs far more valuable than a similar number without any definite connexion between them. A lantern-slide competition, open to members, will be held Tuesday, March 3. The first prize is a bronze medal, offered by the President, other prizes for second and third position being given by Mr. W. Fraser. Six slides (preferably of a connected series) are to be sent in (before February 25) by each competitor, and must be accompanied by a brief descriptive account. The prizes will be awarded by three Judges chosen by the members.

Camera Club.—At the usual Thursday night's meeting last week, Colonel Stewart showed his perfected

PANORAMIC CAMERA,

together with many excellent specimen photographs taken by its aid. In general construction his camera remains as before, but it has been much improved by the substitution of toothed gearing for the belt previously employed. It will be remembered that this camera, by the action of clockwork, travels round on a horizontal table, so that from any high point a view of the entire horizon can be obtained. The negative is taken on rollable film, which passes over two cylinders at the focal plane, a slit about half an inch in width allowing the rays from the lens to find access to the sensitive surface, which travels one way, while the camera moves in the opposite direction. There is a spirit level at the top of the camera, by which it is made truly horizontal; the operator then aims at the extreme left-hand point of the view to be included, presses a pneumatic bulb, which causes the slit in front to open, and the camera to move slowly and smoothly in a central pivot until the required picture is complete. By making the slit V-shaped, more exposure can be given to the foreground than to the sky, and the time of exposure can be regulated by a choice of stop, the speed of the clockwork being constant, and governed by a fly. It will be observed that, owing to the use of the slit, the marginal rays are cut off; therefore it is possible with this camera to use a single lens without fear of distortion. Colonel Stewart intends shortly to try the instrument for portrait groups, and hopes to get fine results. The camera, in its present form, is remarkably compact, and seems to offer no difficulty whatever in working. Colonel Stewart's demonstration was followed by a paper by Mr. EVANS, the subject being

LINCOLN CATHEDRAL.

This was by no means an ordinary lantern show, or we could not afford space to notice it, ordinary lantern shows being somewhat—well—exactly so; but Mr. Evans's paper was a well-considered and well-written account of a cathedral, which, according to Lord Grimthorpe, is the grandest we have, so far as its exterior is concerned. But his paper was not interesting alone on this account, for it showed how the camera, in capable hands, is able to make the most perfect records of architectural work, both in mass and in detail. At one moment we were shown a view of the grand central tower, with its unique ornamentation, and in the next some gargoyle or finial wrought by the loving hand of a mason who had something more than mere wages in his mind when he took chisel and mallet in hand. Mr. Evans is an expert photographer as well as an architectural student, and he is thus able to take each picture with a purpose, sometimes to show how the work of different centuries is dovetailed together, and sometimes to point out how the restorer's heavy hand has blotted out beauties which he could not appreciate. Beginning with the familiar view from the castle, which shows the broad mass of the Cathedral, towering over and dominating the city, its size being apparently increased by the low roofs in the foreground, Mr. Evans took each part of the beautiful structure in detail; the west front, more curious than architecturally satisfactory, with its Norman recesses, like huge sentry-boxes, and its quaint panels, borrowed from some Saxon church of earlier date; then each bit in detail, until one began to wonder what a mass of scaffolding must have been necessary to get the camera into position. The west front done with, we are shown the beauties of the other sides of the sacred fane, and then a lovely little picture of the stairway which leads to the interior. Here we see how the carvings have been hacked about by Cromwell's soldiers, who turned the place into a barrack and stable, and watered their horses at the font, finely carved out of black basalt. But much rich ornament remains, and Mr. Evans has paid such loving attention to it that he has enough pictures to illustrate a thick volume on the subject of Lincoln Cathedral. Would that all lantern shows were so well illustrated! In the course of a discussion which followed the reading of the paper, Mr. GAMBLE gave an interesting account of the way in which the inhabitants of the fen villages saved their valued churches from spoliation at the hands of Cromwell's lambs. When they heard that the soldiers were coming their way, they made preparation to welcome them with open arms, taking care to have ready plenty of alcoholic refreshment. The result was that the men became so helplessly drunk that they overslept themselves, and had no time the next morning to do more than normal damage to the village church. Lincoln neglected these tactics, and suffered perhaps more than it would have done if the soldiers had not, by force of circumstances, been debarred for some days from the pleasures of sacrilege. The evening's entertainment concluded by the exhibition by Mr. Bros of some interesting pictures which he had lately taken during a trip in Spain. These pictures were of the walls of Tarragona, which showed very curiously prehistoric work at their base, Roman work above that, and at the top of all far more modern masonry. These walls are more than twenty feet thick, and have a most extraordinary as well as picturesque effect. Nearly all the buildings in Tarragona show Roman work, and Mr. Bros seems to have found a new and useful field for photography in their reproduction.

Hackney Photographic Society.—February 4, Mr. E. Puttock presiding.—Mr. Guest showed an isochromatic film negative which had been fogged by exposure to the dark-room light—two thicknesses of ruby glass. The film had been developed in a transparent celluloid well dish, and, on holding the dish and film up to the light to judge density, the light had fogged the film through the transparent celluloid. Mrs. SNOWDEN WARD then gave a lantern lecture, illustrated by American exchange slides, and also by some made from negatives taken by the lecturer in and around Shrewsbnry during the Convention week. Mr. SNOWDEN WARD showed a set of six slides, illustrative of work done by the new X rays, and gave at the same time an account of the work being done in the investigation of these newly discovered rays.

North Middlesex Photographic Society.—February 10.—Mr. T. E. FRESHWATER gave a lecture on

BEE CULTURE,

illustrated by the lantern. After describing very fully the insect itself, and its various parts, and the uses of each, such as the tongue and its sheath, the tracheal tubes, constituting the breathing apparatus, &c., he showed slides of hives, both old-fashioned and improved modern ones, with movable trays, which could be shifted when filled with honey. Among the slides were some showing the bees in the act of swarming and being transferred to their new hive. A parasite and various bacilli which prey on the bees were also shown. In view of the great interest shown lately in photographs taken by the X rays of Professor Röntgen, he wound up his lecture by exhibiting some slides from negatives taken by Mr. Swinton of a hand and a live frog, showing the bones through the flesh; also a razor, in which the blade showed through the handle; and coins inside a leather purse, &c. A hearty vote of thanks to the lecturer concluded the proceedings.

Putney Photographic Society.—February 4.—Dr. Cuthbert Wyman in the chair, when a return visit was made from the Kingston-on-Thames Society by Mr. Albert Hill, the subjects being

PHOTO PLASTICS, and TONING, INTENSIFYING, AND REDUCING WITH URANIUM.

Mr. Hill commenced by giving a brief description of photo plastics, exhibiting some interesting examples of photographs in relief, and a series of casts showing the correction of false modelling from the cabinet print to the copper-deposited portrait. Their uses for ornamental relief work and die-sinking were briefly touched on. The lecturer proceeded to give a demonstration on the uses of

URANIUM FOR TONING, INTENSIFYING, AND REDUCING.

Negatives and positives were treated, and the method of building up and reducing by ammonia and glycerine explained. His method of treating negatives of extreme contrasts was shown, which proved to be most effectual as well as simple in its working; finished negatives with prints taken at different stages were also exhibited. Bromide prints were then successfully toned.

Richmond Camera Club.—January 27.—Mr. CEMBRANO (the President) gave a useful and interesting address, entitled

MY CAMERA, HAND AND STAND, AND HOW I USE IT.

Though professedly elementary, it contained a number of hints, of value to more experienced workers as well as to beginners, on the subject of cameras and all their accessories.

FEBRUARY 3 was an Open Lantern Night. — Mr. Cembrano presided, and a very interesting series of slides, by Messrs. F. A. Bridge and A. Bridgman, entitled, *Our Tour in Norway*, was shown. The towns, villages, inhabitants, and natural scenery of Western Norway were admirably illustrated by some 180 pictures, which were well described by Mr. Bridge, and highly appreciated by his audience.

South London Photographic Society.—February 3, the President (Mr. F. W. Edwards) in the chair.—Mr. W. H. DAWSON, Vice-President of the Woolwich Photographic Society (under the scheme arranged between the Secretaries of the metropolitan photographic societies for the exchange of papers), gave an address on

THE CHEMISTRY OF EVERY-DAY PHOTOGRAPHY.

He dealt, first, with the support for the photographic film, and said that it should be transparent, not liable to change on keeping, and not acted upon by the chemicals used in development. Glass fulfilled those requirements in the highest sense. Celluloid was often used, and was highly electrical in its nature. It would be interesting to submit a plate and a film to the new rays, to ascertain whether the plate was more rapid than the film. Gelatine was used chiefly for holding the haloid salts. The various properties of gelatine were explained, and the methods by which those properties were taken advantage of in the manufacture of dry plates. The halogen salts of silver were then dealt with, and the changes which took place during exposure and development were explained by means of diagrams and symbols on the blackboard. Captain Abney's experiment of placing an exposed plate in bromide to destroy the effects of light was referred to. The chemistry of development was fully explained, together with the uses of the various chemicals used. In fixing after development, the lecturer said he used hypo as strong as the plate would stand, to prevent the formation of an insoluble salt, which could not be removed from the film. Reduction and intensification received their share of attention. Mr. Dawson said he seldom used mercury and ammonia for intensification, as he preferred Monckhoven's silver and cyanide method. Orthochromatic plates are either prepared by mixing the dye with the emulsion or by dissolving the dye in water with a little ammonia, and bathing the plate in the solution and drying it before use in a dark room. The chemistry of the various printing processes—platinotype, bromide, albumen, gelatino-chloride, &c.—brought the address to a conclusion, and was followed by a discussion on various points raised.

Bath Photographic Society.—January 29, Mr. Augustus F. Perren in the chair. Messrs. C. J. Taylor, A. Taylor, J. S. Turner, and E. Wright were elected members of the Society. Messrs. E. J. Appleby and J. A. Howe were reappointed Auditors of the accounts. A discussion on the new discovery in photography was opened by Mr. AUSTIN J. KING, who, having recapitulated all known information on the subject, suggested that the Society should obtain the services of a capable lecturer to demonstrate in Bath at an early date. Mr. W. PUMPHREY considered it most desirable the Society should take immediate steps to elucidate by demonstration all known facts. The Secretary was instructed to make the necessary arrangements without delay.

Birmingham Photographic Society.—February 4.—the PRESIDENT (Sir J. Benjamin Stone, M.P.) exhibited about 100

PHOTOGRAPHS OF THE TRANSVAAL AND SOUTH AFRICA,

taken by himself during a two-months' tour with his daughter. Sir Benjamin gave a short discourse, during which he said: "Starting from the Cape, we travelled in a wagon, visiting all the places of interest, and obtaining an amount of knowledge of South African life which it would have been impossible to so accurately acquire in any other or more agreeable way." Sir Benjamin never carried arms, but was protected by his four Zulu servants, and the tour was accomplished without accident or alarming incident. During the tour he exposed about 600 whole-plates, most of them being films. He had an interview with President Krüger, who, it is said, could speak the English language, and yet, during the interview, he would only converse with him (Sir Benjamin) by the aid of an interpreter.

Moseley and District Photographic Society.—February 7, Dr. Hall Edwards (President) in the chair.—Attendance, thirty-seven. The minutes of the inaugural meeting being read and signed, a short discussion took place in connexion with the new radiation photography. Dr. Hall Edwards passed round for inspection the first photograph he had produced by means of the X rays. The print, an exceedingly good specimen, showed a half-crown, a sixpenny piece, a picture ring, two keys, and a microscopic cover glass. These were all taken through a sheet of aluminium one-thirty-second of an inch in thickness, and four layers of black paper. The interesting point in the photograph was the clearness with which the microscopic cover glass was depicted, although its thickness was not more than one-hundred-and-twentieth of an inch. This, we believe, was the first photograph taken in the Midlands by means of the new X rays. The PRESIDENT then called on Mr. HUBERT COOP, artist, to deliver his lecture on art, entitled

A FEW REMARKS IN CONNEXION WITH PICTURE-MAKING.

He presumed that the object of the artist, or artist-photographer, was not only to present the picture of a place or locality, but to present it in an artistic way, so as to be interesting, pleasing, and valuable, not only to those that are acquainted with it, but also to those that are not, and to depict the scene with the most appropriate sentiment and effect. He thought the name of the locality the least important point about a picture. Photographers, he felt, often sacrificed the composition of a subject to the size of the plate; a small portion from, perhaps, one of the sides, the top or bottom, would make a good composition, whereas, otherwise, the pictorial effect would be lost. He admitted that photographic artists were considerably handicapped in not being able to take liberties with nature. Good composition is most essential to a good picture. The principal masses should be nicely grouped, and not scattered promiscuously about. In illustration of his remarks Mr. Hubert Coop sketched in charcoal an outline as a study of composition, gradually filling in as necessary to illustrate his remarks. He started by drawing in the horizon, high up in the picture. He preferred a high horizon, and gave as a reason that having a more expansive foreground gave more scope for the introduction of an incident, drawing in with lightning rapidity a splendidly drawn boat on the right-hand side. That being his principal object and chief point of interest, he stated that all subordinate objects should lead the eye up to it. He laid special stress in warning them not to have two points of interest of equal or nearly equal strength, but only to have one great interest, all others being secondary. Photographers made a very great mistake in so carefully avoiding to photograph facing the light, so much of the untrue detail which is so often seen in a photograph is thus lost. He advised the artist photographer, when looking for subjects, to try and imagine them under different effects of light, and only when the best lighting appeared to take the picture. In touching elaborately on relative tone values, he stated that most photographic pictures were out of tone, mostly too dark. He advised his audience always to aim at an effect; if they did not, they would be liable to get a nature-at-dinner-time sort of look about their picture. Any incident introduced should retain an accidental look, and not have the appearance of having been placed there, and should be strictly in keeping with all its surroundings. The introduction of a figure is not sufficient, there must be some apparent reason for it. He illustrated how the sky formed a most important feature in improving or spoiling the composition. If the principal lines of the composition run from right down to left, the sky clouds should generally run from left down to right. In conclusion, it would be well to bear in mind that the artist appeals to your imagination, and he *never attempts* to deceive your eye, like a conjuror. The artist was kind enough to leave the sketch to grace the walls of the meeting room, by special request of Dr. Hall Edwards, the President.

Oxford Camera Club.—The Annual General Meeting of the Club was held on February 3. The report of the Secretaries showed a steady increase in the membership, the number having risen from fifty-eight to seventy-five, the latter figure including thirteen ladies. Eighteen meetings have been held during the past year. Since July the Club has had the privilege of meeting in the University Museum, an advantage which has been much appreciated. The Treasurer's report showed a balance of nearly 9*l.*, including a profit of 16*s.* from the Exhibition held in November. A few slight alterations in the rules were then passed, and the officers elected for the ensuing year. A set of slides, by the Manchester Society, obtained through the affiliated societies, was then shown on the screen. During this part of the programme the Secretaries showed the working of one of Mr. G. Davenport's curtain-effect carriers. This

worked very well and smoothly, and was on the table for inspection at the end of the meeting. Where a curtain effect is desired, nothing better could be wished.

Plymouth Photographic Society.—

FLASHLIGHT PICTURES.

On Friday, February 7, the PRESIDENT of the Society (Mr. E. H. Micklewood) demonstrated to some forty members and friends, using for the purpose a flashlight lamp made after the pattern of those used by Mr. Burran, of Cambourne, who has produced such excellent photographs of Cornish mines. Mr. Micklewood made two flashes, using pure magnesium powder, and, as a result, some thirty plates were exposed by the members present. One negative was developed by the demonstrator, and proved of very excellent quality. Mr. Micklewood made the subject very interesting, showing prints of flashlight pictures of the principal scenes in the local pantomime of *Dick Whittington*, at the Theatre Royal. Four new members were elected, the member roll now approaching sixty.

Edinburgh Photographic Society.—A lecture was delivered on January 30 by Mr. H. Bellyse Baildon, M.A.Cantab., F.R.S.E., Sir James Russell in the chair.—The subject was

THE PAPUAN AT HOME,

to illustrate which Mr. Baildon showed a large number of slides from photographs which he had taken while on a visit to New Guinea. The lecture was much appreciated by a large audience, and Mr. Baildon was accorded a very hearty vote of thanks for his kindness in providing such an interesting evening. Thanks to the energy of the Secretary, Mr. J. S. McCulloch, W.S., a number of slides from negatives by Dr. Dawson Turner, Edinburgh, and Mr. A. Campbell Swinton, London, illustrative of the new electric photography, were shown on the screen at the close of the lecture just referred to. A photograph of the skeleton of a lady's foot, showing malformation of one of the bones of the little toe through tight boots, and another of a frog taken through a sheet of aluminium especially attracted attention. Most of the slides were made by Messrs. Walls & Fraser, Lothian-street; and a new lantern, specially built for the Society by Mr. A. H. Baird, F.R.P.S., Lothian-street, was used for the first time at this meeting. It gave much satisfaction. The

ANNUAL EXHIBITION OF THE SOCIETY

was opened on Saturday, February 1, by Mr. F. W. Carter, C.A. The Exhibition is to remain open for a month, and an entertainment will be provided every Saturday evening. Mr. Chas. A. Stitt and Mr. James Patrick have each consented to give a lecture, the former having chosen as a title "Looking Backward," and the latter "The Early Home and Haunts of Robert Louis Stevenson." Messrs. Stitt and Patrick have both been heard before, and their names have only to be mentioned to ensure a crowded house. The other Saturday nights will be devoted to music. The Exhibition this year is distinctly the best that the Society has yet held, the work being of a high standard of excellence. A steady progressive movement has been noticed for many years past, but this year a greater stride than usual seems to have been taken, owing, no doubt, partly to the large increase in the number of members, and partly to the increasing attention which workers are paying to the art side of photography. A new feature this year is the introduction of an open class—a good move, as it gives an opportunity to members of comparing their own pictures with those of the best outside workers, and thus the standard of work is sure to be raised. Two very strong sections in the show are the class for amateurs only and the Lady Members' Class, the latter containing some very beautiful work indeed. Class III. (for figure studies) also contains some very good pictures. In fact, taking the Exhibition all round, it is quite a success. Sir Francis Powell, P.R.W.S., Mr. W. Crooke, and Mr. W. M. Warneuke acted as Judges, and made the following awards:—Section I. (open to members and non-members, subject optional): No. 19, silver medal, J. B. Johnstone; No. 11, silver medal, John H. Gear, F.R.P.S.; No. 13, bronze medal, E. R. Ashton. Section II. (open to members only): Class I. Best set of six lantern slides—silver medal, James Patrick; bronze medal, Charles Alfred Stitt. Class II. Best picture, half-plate size and under—No. 114, silver medal, James Hay; No. 124, bronze medal, Miss Christian H. Curle; No. 116, bronze medal, Alexander Allan. Class III. Best figure or *genre* composition—No. 177, silver medal, John Warrack, jun.; No. 182, bronze medal, John Warrack, jun. Class IV. Best picture above half-plate size, other than figure or *genre* composition—no awards. Class V. Hand-camera work, five or more pictures—No. 189, silver medal, Charles A. Stitt; No. 195, bronze medal, Alex. McNab; No. 197, bronze medal, James Hay. Class VI. Best picture, being the work of a lady member—No. 165, silver medal, Miss Daisy Duncan; No. 134, bronze medal, Miss Christian H. Curle. Class VII. Best set of three pictures taken at the 1895 Saturday rambles—No. 169, bronze medal, Alexander Allan. Class VIII. Best enlargement—No. 55, silver medal, J. B. Johnstone; No. 54, bronze medal, C. W. Sinclair. Section III. (amateur members only; best direct picture): No. 68, silver medal, Douglas Croall; No. 74, bronze medal, J. R. Roddick.

FEBRUARY 5, Mr. James Patrick (Vice-President) in the chair.—A lecture on

ANIMAL PHOTOGRAPHY

was delivered by Mr. CHARLES REID, of Wishaw, who is well known as an authority on this subject. Interspersed with anecdotes, of which Mr. Reid possesses a rare fund, and illustrated by a series of slides which, for artistic and technical excellence, are second to none, the lecture could not fail to be highly interesting, even to those who knew very little about photography. Great admiration was expressed for the manner in which the pictures, many of which must have been taken under the most trying circumstances, were composed and lighted, a considerable number of the subjects having been taken right against the light. At intervals during the lecture music was provided, and at the close hearty votes of thanks were accorded Mr. Reid and all who had contributed towards the evening's enjoyment.

FORTHCOMING EXHIBITIONS.

1896.

February 27-29 ..... Woolwich Photographic Society.

March 2-6 ..... *South London Photographic Society. Hon. Secretary, Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.

,, 3-6 ..... *Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

☞ Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

PHOTO-CHROMOSCOPES.

To the EDITORS.

GENTLEMEN,—Mr. Edwards has kindly shown me the photo-chromoscope which is figured on page 85, and also a three-step photo-chromoscope which, he informs me, was his first model. I cannot doubt his statement that he conceived the idea independently, notwithstanding the fact that my United States patent, disclosing everything, was published more than two months before he even applied for provisional protection.

Like Mr. Edwards, I had the idea in mind (as a three-step instrument) long before (in my case some years before) I applied for a patent. I waited to invent the folding chromogram, the two-step construction, and other improvements, and then my *complete* specification was filed about a year and a half before Mr. Edwards! I even claimed the use of the apparatus as a camera, although I have something better for that purpose; and I use coloured glass reflectors instead of thinly silvered mirrors, because they are more perfect for a viewing instrument, cheaper and less easily damaged. The silvered mirrors have to be varnished to prevent tarnishing, and cannot be cleaned by rubbing, like the coloured glasses—a serious defect in an instrument which has to be kept in order by ordinary purchasers.

It is evident that, inasmuch as they have been constructed in accordance with my patent specifications, and for the purposes specified therein, and are infringements of my patent claims, neither the instrument described by Mons. Vidal nor that constructed by Mr. Edwards can be properly described as "other photo-chromoscopes . . . . that produce equally remarkable results."—I am, yours, &c., F. E. IVES.

119, *Shaftesbury-avenue, W.C., February 7*, 1896.

COLOUR RENDERING ON ORDINARY PLATES.

To the EDITORS.

GENTLEMEN,—The insertion of the enclosed copy of letter, sent to the Hon. Secretary of the Croydon Camera Club will oblige.—I am, yours, &c., E. J. WALL.

[COPY.]

DEAR SIR,—According to the reports which have appeared in the photographic journals, Mr. G. R. White said, in a lecture before your Club:—

1. "That ordinary plates will, providing a full exposure be given, yield results in colour rendering not inferior to those of isochromatic ones."

2. "That the improvement in colour rendering possible with an isochromatic plate is not exhibited unless a prodigiously dark screen be used and an exposure is given several *thousand times* longer than is needful with an ordinary plate without a screen."

These, it is stated, are conclusions deduced from numerous experiments, and as they are at total variance with the results obtained by Vogel since 1873, by Eder, Abney, Schumann, Bothamley, &c., and my own work begun in 1889, I challenge Mr. White to meet me before some independent and competent body such as the Photographic Club or the London and Provincial Photographic Association, to prove his statements or allow me to disprove them.

I shall be glad if you will communicate the contents of this letter to Mr. White and your members at your next meeting, and let me know Mr. White's decision.

In conclusion, I beg to inform you that I am sending a copy of this letter to all the photographic journals.—Yours truly, E. J. WALL.

PHOTOGRAPHIC COPYRIGHT.

To the EDITORS.

GENTLEMEN,—A writer in a monthly contemporary, under the heading of "Cast Iron Laws," makes some reflections on Rule 23 of the Photographic Copyright Union—a rule which he admits is excellent in principle, and with which he states himself to be in full agreement. But evidently, in the writer's mind, there is a disinclination that the rule should

be strictly observed, he wants exceptions to be made. What is a rule or law but a positive assertion of a principle that must be absolutely followed—permissive rules or permissive laws are not worth the paper on which they are printed? That is common experience; and there is no escape from this. If a rule is a good rule, it must be followed implicitly; if a bad one, the only course is to cancel it.

For the benefit of your readers I give the rule in full.

Rule 23.—That no member shall allow a copyright picture belonging to him to be reproduced (whether registered or not) for a less fee than 10*s.* 6*d.* on each occasion, and for each different publication or form in which it is used, but he shall be at liberty to charge a larger fee according to his own ideas as to its value.

Even in the best rules that have ever been made, there must be times when they will cause an apparent loss. It is impossible to make a rule that will cover every possible circumstance. It is quite sufficient if its strict observance secures the greatest amount of benefit. This, I believe, to be the case with our Rule 23. It was not adopted without repeated discussions by those most interested in obtaining a successful result.

As regards the minimum fee for the right to reproduce landscape photographs, this was arrived at after discussion by thirty of the leading view publishers and view photographers in the Kingdom; and, as yet, I have not heard one of them express an opinion that it has not acted quite satisfactorily for their interests.

The journalistic photographers—or proprietors of photographic newspapers—should be the last to beat down the price for reproduction of copyrights. The photographer who sells this right for book illustrations is certainly not the one who will agree with the *Photographic News* that he should be contented to receive a less fee than that advocated by the Photographic Copyright Union. It has been proved over and over again that the publishers can well afford to pay this small fee.

We trust the writer of "Cast Iron Laws" will, on further consideration, think fit to take the same view of this matter as the Photographic Copyright Union; and certainly, journals especially devoted to photography, should stand shoulder to shoulder with those who are labouring to protect the copyright interests of the profession generally.—I am, yours, &c., HENRY GOWER, *Secretary (for the Committee)*,

Botolph House, Eastcheap, London, E.C., February 10, 1896.

THE RECENT LIMELIGHT COMPETITION.

To the EDITORS.

GENTLEMEN,—If Mr. Gwyer's letter in your last issue means anything at all, it means that the Chairman, the members, and reporting Secretary of the Photographic Club, present at Anderton's Hotel on January 22, are an aggregation of dishonourable men, who conspired to rob him of his just due; otherwise, how is it that, in view of the fact that the Chairman declared, with the concurrence of all the gentlemen present, and in Mr. Gwyer's hearing, that his jet and mine were considered to be of equal light-giving power, he should write to you feigning surprise that the result was so reported in your JOURNAL?

The statements contained in Mr. Gwyer's letter are directly contrary to fact; for instance, the first result was not declared in his favour but in mine, I being 100 against his ninety-five, or five points to the good; the second result gave Mr. Gwyer 100 and me ninety-nine, or one point to him, whereupon I stated that I was willing to consider it a tie. A third trial subsequently took place and the result was declared a tie.

I do not propose to correct all the inaccuracies of which Mr. Gwyer's letter is compounded, but I make him a practical offer, which, if accepted, will settle conclusively the question at issue.

I suggest that we submit our respective jets, with a series of nipples of from, say, one-twelfth-inch to one-twenty-fourth inch bore, to Mr. Hearson (with whom I am unacquainted), and one or two more independent experts to be nominated, Mr. Editor, by you, with instructions to test one against the other in any and every way they may think fit; that Mr. Gwyer and I be not present nor have anything whatever to do with the testing; that the report of the referees be published in your JOURNAL; that such report be considered conclusive as to the merits of the respective jets, and that the owner of the losing jet pay the costs of the reference.

I am also willing, if agreeable to Mr. Gwyer, to add a further condition, viz., that the loser give twenty guineas to a charity to be named by the winner.

If Mr. Gwyer is so cock-sure of the superiority of his jet, here is an excellent opportunity for him to prove it, besides benefiting some deserving institution and getting a splendid advertisement for himself as a jet-maker into the bargain.

I am only an unsophisticated amateur myself, with no axe to grind, so, if Mr. Gwyer succeeds, I shall be prepared to congratulate him as heartily as any one; but I cannot congratulate him upon his sense of fairness as disclosed in the letter to which I am now replying.

In that letter he refers to the size of the chamber of my jet, but he is discreetly silent as to the bore of the nipple *he* used being more than one-third larger than mine, viz., ·085 as against ·072, which is a most important consideration; nor does he inform you that, owing to the small size of the lanterns available at the competition, my jet had to be taken off base plate, tipped forward, and held in position in the fingers during the testing, and was never properly centered, a fact perfectly well known to Mr. Gwyer and every one else present. Any one who knows anything about lantern work will realise the difficulty I had to contend with in competing at all under such conditions, and yet, notwithstanding, I managed to tie with my opponent. Although Mr. Gwyer says his jet was burning the whole evening, which was not the fact, he does not mention that he started a fresh lime, supplied from my own tin, immediately before every trial.

In conclusion, let me say that my offer means business, which is much more to the point than paper warfare. Let Mr. Gwyer either accept it or hold his peace. At any rate, if he must rush again into print, I trust he will do so in the spirit he displayed at the competition, and not as exhibited in his last letter to you.—I am, yours, &c.,

Crouch End, February 8, 1896. W. SCARBOROUGH.

THE LEEDS CONVENTION.

To the EDITORS.

GENTLEMEN,—Will you kindly allow me to remind your readers that the Photographic Convention of the United Kingdom will, this year, hold their annual gathering at Leeds, in the week commencing Monday, July 13, and under the Presidency of H. P. Robinson, Esq.

The Leeds Reception Committee numbers fifty-six of the leading residents of the district, the executive branch of this Committee consists of Messrs. J. H. Walker (Chairman), Herbert Denison (Hon. Treasurer), B. A. Burrell, Washington Teesdale, W. J. Warren, H. F. Wigglesworth, and Dr. J. T. Thresh, Mr. Godfrey Bingley, of Thorniehurst, Headingley, Leeds, holding the position of Local Hon. Secretary.

The above executive Committee have held several meetings during the last few months, and their arrangements are approaching completion.

Important papers will be read and discussed, and there will be various demonstrations of practical utility to all photographers.

The rooms of the Leeds Philosophical Society have been secured for the Convention week; their central position and conveniences will be much appreciated by Conventioners.

The Mayor of Leeds (the Right Hon. W. L. Jackson, M.P.) has kindly offered to "receive" the members of the Convention on Monday evening, July 13.

Attractive excursions have been arranged for, amongst other places to Bolton Abbey and Bolton Woods, Kirkstall Abbey, York with its famous Cathedral, Richmond (Yorks), Ripon, Studley, and Fountains Abbey, Knaresborough; and Plumpton Rocks (Harrogate), the well-known watering place is about two miles distant from Knaresborough.

From accounts from various sources a very large attendance is anticipated, probably exceeding that of any former Convention, which will be, doubtless, exceedingly gratifying to that ever-popular veteran, Mr. H. P. Robinson, who will occupy the presidential chair at Leeds.

The Council of the Convention wish to impress upon all members who attended the memorable Shrewsbury Convention of last year the importance of bringing or sending to Leeds for exhibition during the week of Convention lantern slides from the negatives taken while in Shropshire.

Gentlemen wishing to make trade exhibits of processes or apparatus (for which there are great facilities) during the Convention week, or who would desire to advertise in the official programme of the Convention (the only one to be issued), will kindly communicate either to Mr. Godfrey Bingley, the Local Hon. Secretary (address as above), or to yours, &c., R. POULTER DRAGE, *Hon. Secretary P.C.U.K.*,

95, *Blenheim-crescent, London, W.*

P.S.—The annual subscription is now due.

SAPIENT SUGGESTIONS.

To the EDITORS.

GENTLEMEN,—"An Old Member" has triumphed over me, for I have unreservedly to confess that I am wrong and he is right about Charles II. I thank him for the moderation he has displayed in his victory.

The "dreadful shame" I feel is, however, not unmixed with pleasure, for, at least, I have enabled him to experience an unusual and delightful sensation in being right for once; and—who knows?—perhaps having once attained that brilliant position, he will try to maintain it, and will become quite a good boy, be rewarded with that honorary fellowship, and live happily ever after.—I am, yours, &c., ANOTHER OLD MEMBER.

[This correspondence here terminates.—EDS.]

THE PHARMACEUTICAL SOCIETY.

To the EDITORS.

GENTLEMEN,—I am sorry I cannot spare the time just now for a thorough analysis of "J. A. C. O.'s" letter. Would it be too much, meanwhile, to ask for further particulars and details of the immense suffering, the crippled and struggling industries, and general stagnation,

&c., caused by this poison monopoly——bearing in mind "J. A. C. O.'s" admission, relative to the facilities afforded by our own and foreign wholesale houses for the supply of these scheduled chemicals?

I suspect our friend to hold a brief on behalf of the tho class of legally oppressed men anxious to become lawyers, medical practitioners, chemists, and the like, without going through the requisite preliminaries. Lots of people, no doubt, would support a return to the *status quo ante*, and abolish monopoly everywhere.

The sole object of my letter was to point out, what I think is incontestable, that from the earliest days the sale of photographic chemicals has been in the hands of chemists and druggists, and that they are, by examination, equal to the demands made upon them.—I am, yours, &c.,

D. D.

THE CATHODE RAYS.

To the EDITORS.

GENTLEMEN,—You have made an error saying Crookes had first discovered the cathodic light. It was the German philosopher, Hittorf, who first introduced it to the science, and Crookes imitated it.

It was an accidental discovery, as Columbus discovered America, and why that envy?—I am, yours, &c.. MARIE WALDE.

51, *Gower-place, Euston-square, W.C.*

HALATION.*

IF one takes a photograph of an object in which the contrast between light and shade is very marked, the negative shows, if certain precautions have not been taken, a nebulous luminosity round the light, which makes the picture at this place indistinct. It has been believed, until now, that this phenomenon was caused by reflections from the back part of the glass plate; the author, however, is of a different opinion.

If the hypothesis mentioned above is correct, some parts of the picture showing halation should be double; but this is not the case.

Also, he believes that the strongly dispersive power of the emulsion layer would prevent the reflection of the transmitted light from the second surface. The light, after leaving the emulsion layer, is quite equal, and would, on getting to the back part of the plate, cause, at the most, a general fog; but that does not happen.

Founded on accurate research, the author gives it as his opinion that the phenomenon of halation is caused by interference. It seems to be produced by light reflections in the inner part of the camera, *i.e.*, from the blackened inner surface of the objective mounting. It may be avoided if the objective is protected against injurious light or if the inclination of the apparatus is altered a little. R. ROUSSEAU.

THE PHOSPHORESCENCE OF GELATINE PLATES.†

THE phenomenon, observed by several experimentalists of gelatine plates, soaked in a pyrogallic acid developer, becoming luminous when placed in a dilute solution of citric acid, is caused, says the author, by a process of oxidation which gives rise to a luminosity identical with that produced during the slow oxidation of phosphorus, and renders it probable that all processes of rapid oxidation are accompanied by evolution of light, even when the oxidation takes place in aqueous solution, though a certain intensity of oxidation is required to give rise to it.

Other developers than pyrogallol, even when possessing a nearly similar constitution and properties, such as hydroquinone, do not give rise to luminosity.

The cause of the luminosity is explained by the author in the following way:—

1. The alkaline pyrogallol solution gives, on addition of acids, oxygen which oxydises the sodium sulphite in the developer to sodium sulphate, with evolution of light.

2. The pyrogallol solution, when mixed with caustic soda and sodium sulphite, absorbs oxygen from the air, and this oxydation is also accompanied by evolution of light.

The correctness of this explanation is rendered probable by the fact that easily reducible bodies, such as permanganate of potash, give out light on addition of alkaline pyrogallol solution.

When sodium sulphite combines with oxygen in the presence of pyrogallol, no luminosity is produced even if the pyrogallol has been previously slightly oxidised; but, when alkaline pyrogallol solution, which has been partly oxidised, is decomposed by the addition of acid, the author considers it probable that some of the oxidation products of pyrogallol are decomposed with evolution of oxygen, which combines with the sodium sulphite, forming sulphate, and thus giving rise to luminosity.

F. PRICHT.

* *Bulletin Association Belge Phot. Photo Centralbl.* 1895, i. 5.

† *Phot. Rundschau*, 1895, ix. 32.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Mr. L. M. Williams, 1, Upper Camden-place, Bath.—*Three cabinet photographs of Rev. Canon James Fleming.*

William Harrison, per S. Thorn, 18, The Crescent, Bude, Cornwall.—*Two views of dining hall, and one view of drawing-room, at Tonnacombe House, Moorwinstow, Cornwall.*

M. STARITANOFF.—Please send address and particulars.

LENSES.—L. M. (Dublin). Our experience is that, under equality of conditions, there is little to choose between them.

RESIDUES.—W. SMITH writes: "Is it any good saving the pyro developer for the silver it contains?"—In reply: No; it contains none.

BLUE-BLACK TONE ON PLATINUM PRINTS.—PRINTER. See Mr. Dollond's paper in the JOURNAL for March 1, 1895, which describes a process for giving a blue-black tone to platinum prints.

SMALL GAS BURNERS.—H. ABBOTT. Any gasfitter will obtain them to order, if he has them not in stock. They may be had in wholesale quantities from Messrs. Hulet & Co., Holborn, we believe.

SPOTTING COLOURS.—E. LAVENDER. Spotting colours, that will answer the purpose, are supplied by all the dealers. Mr. Rudowsky, 3, Guildhall-chambers, E.C., also supplies special spotting colour.

ADDRESS WANTED.—W. N. (Biarritz).—We presume you mean the plate-makers. The only address we know of is, Cours Gambetta et Rue Saint Victor, Monplaisir-Lyon.

NON-RETURN OF SPECIMENS.—J. BLENKINSOPP has suffered from those people who ask for specimens and do not return them, and asks, "What can I do?"—In reply: Write to the Superintendent of Police in the town, giving him a short account of your experience.

CARBON PRINTING.—T. MCCARTHY. A sensitising bath of three and a half per cent. will be a suitable one for general work. Five per cent. may be used for negatives with excessive contrasts with advantage, but it will be too strong for thin and feeble negatives, unless the time of the immersion of the tissue is very short.

COLOURED EFFECTS ON THE LANTERN.—A. SIMMONS. Coloured gelatine films can be used in the lantern, but they are not to be recommended, as with the heat they get dry and brittle. If they contain moisture, they are liable to buckle and lose their flatness. Coloured glasses are much to be preferred.

FADING.—S. O. R.—The print enclosed is not a sample of the way that albumen pictures fade in a few weeks, because the image has not faded at all. The change, where the picture is not shielded by the mount, is due to the fading of the rose tint of the paper; hence your strictures on the albumen process come to nothing.

MATT VARNISH.—GEORGE DANIELS writes: "I am told that a solution of sandarac in toluol makes a good matt varnish. Can you tell me what proportions are the best to employ?" In reply: Dissolve 100 grains of sandarac in two drachms of ether. Filter the solution through a taft of cotton-wool, and then add six drachms of toluol.

RELIEFS.—T. WHARTON. It is quite possible to take a cast in fusible metal from a gelatine relief which will be perfectly sharp, but, of course, the gelatine must be quite dry. The metal cannot be employed for casting from a moist relief in its "swelled" state, as the heat would cause it to run. If a cast from a swelled gelatine relief is required, plaster of Paris is the thing to use.

LENSES.—T. W. R. The case of six lenses and one mount in a case, bearing the name of A. Darlot, is a set of lenses of different foci. By screwing the different glasses at either end of the tube, doublets of various foci are obtained. They have to be used with comparatively small stops, and with them a large angle of view may be obtained. They are, of course, somewhat slow in action.

BACKGROUND.—E. DESMOND. If the canvas has got so slack and fluted as stated, there is nothing to be done but to take it off the frame and restrain it, and that should be done before it is refiatted. If the frame were made with wedged corners, like the "strainers" of artists' canvases, they need only be driven a little tighter, which would do the necessary stretching. Background frames should always be made on that principle.

EMAMELLING PRINTS.—OXON complains of small air bubbles getting imprisoned between the print and the glass, which, he says, no amount of squeegeeing will get rid of, and asks if we can offer any suggestion.—The most prolific source of this trouble is using the gelatine solution too strong, and at too low a temperature. Try a weaker solution, and use it hotter. Also take care there are no minute air bubbles in the solution in the form of froth.

CERAMIC PHOTOGRAPHY.—T. READER. You have been misinformed as regards a patent and a licence being necessary to produce ceramic photographs by the substitution process. With reference to the comparative merits of the substitution and the powder processes, each have their advocates. We have produced good results by both methods, and, on the whole, we prefer the former, though it requires, perhaps, a little more manipulation and skill to work it.

PORTRAITURE BY GASLIGHT.—R. YORKE says: "Would you please give me the name and address of the gentleman in Birmingham who wrote you about two months ago about his inventing an apparatus (gas) for taking photographs at night? I remember he sent you some specimens of his work taken by the light at the time of his communication. I am thinking of trying the light, and should like to communicate with him as to power of light, cost," &c.—The address is J. W. Beaufort, Birmingham.

MOONLIGHT EFFECTS.—AMATEUR asks "how the moonlight pictures seen at exhibitions are obtained?"—In reply: These are, as a rule, neither more nor less than photographs taken in the daytime, the camera pointed towards the sun, which should be low down on the horizon. The direct rays of the sun should not shine into the lens, but be shielded by a cloud, for instance. The plate is very much underexposed, and the print is toned or stained to a bluish tint, to suggest moonlight, or a carbon print is taken on blue tissue.

GUTTA-PERCHA VESSELS.—JAMES G. LOWELL asks if we recommend the use of gutta-percha vessels for containing solutions of silver nitrate for wet-collodion work?—In reply: We do not. Pure gutta percha is said to have no action upon a solution of nitrate of silver; but it was frequently found, in the days when such baths were more generally used, that the impure gum of which they were composed had a most deleterious action upon the solution, and the bath, if it had been kept in a gutta-percha receptacle for any length of time, deteriorated considerably.

GELATINE WET PLATES.—A. E. H. says: "1. I shall be obliged if you will inform me whether it would be practicable to prepare wet plates by using gelatine as a medium instead of collodion, the process otherwise resembling the old wet plate? 2. Would not such plates be of greater speed than collodion plates, and of purer grain than most commercial plates?"—In reply: 1. The process is quite practicable. We are aware of one gentleman who uses "wet" gelatine emulsion, but it is washed. 2. Probably the speed would be greater; but, the higher the speed, the greater the granularity would be.

LENSES AND PLATES FOR STEREOSCOPIC PHOTOGRAPHY.—W. HILL inquires as follows:—"What is the smallest size of plate which can be employed for taking the ordinary stereoscopic views? What focus lenses should be obtained for such work—that is, when one pair only can be afforded? What is the best focus lens to use in the stereoscope itself?"—In reply: The smallest plate that can be used is one $6 \times 3\frac{1}{4}$, but plates $6\frac{1}{2} \times 4\frac{1}{4}$ are more generally employed, since this size is obtainable without difficulty, and if not can be replaced by two quarter-plates used side by side. We should recommend the use of a pair of four or five-inch lenses on the camera, and those in the stereoscope may be similar as regards focus.

LENS; VENUS PAPER.—C. S. asks: "1. If the round, transparent marking in the centre of a plate sent is a 'flare spot?' He found it on six plates exposed in succession with a rapid rectilinear lens, *f*-64. 2. Is it due to a defect that should not exist in one of the highest-priced lenses in the market? 3. Can you inform me where 'Venus' paper is to be procured?"—In reply: 1. The subject chosen seems to us one peculiarly adapted for giving the defect pointed out. It is not a flare spot, but probably a "ghost." Better refer the matter to the makers. 2. Possibly a slight alteration in the separation of the lenses is all that is necessary. 3. Milne & Co., 1A, Ramsden-road, Balham, S.W.

CARBON LENS.—NEMO writes: "Please oblige me in saying what is the cause of carbons 'washing off' in the high lights. Can it be entirely avoided? Also, say what lens I could get to come nearest the following qualifications:—'Great depth of focus,' 'short focus,' 'wide aperture' for enlarging purposes?"—Certainly it can be avoided. There may be several causes for the trouble, but the most general are under-exposure, and the use of too hot water. Insufficient sensitising, or the tissue not being in the best condition, are also causes. The qualifications required in the lens are incompatible with each other. The lenses most generally used for enlarging with are portrait lenses or those of the "rapid" type.

ENLARGING LANTERN.—VANDYKE writes: "I wish to purchase an enlarging lantern, but I know very little about them. Would you kindly give me some assistance by answering the following questions:—1. Should I do better with limelight than oil or incandescent gas? 2. Would my Wray rectilinear, five-and-a-half-inch focus, *f*-8, be a good one for enlarging from quarter-plates? 3. Is ————'s lantern as good as any on the market? 4. Have rectangular condensers any advantage of circular?"—In reply: 1. Theoretically the limelight is best, but there is really very little difference in practice. 2. Yes; if you do not use the lens, usually, supplies with the lantern. 3. Yes. 4. None whatever.

APPRENTICES.—T. T. E. asks: "Am I right in expecting my apprentice to take home some of our orders when they are for customers within a reasonable distance, say, a mile, of the studio? Is this the custom of the trade or not?"—In reply: This depends largely on the actual terms of the indentures, but it should always be borne in mind that an apprentice is not engaged as a drudge, but to be taught the craft, and that the functions usually discharged by an errand-boy can hardly be considered as forming any branch of professional photography. As far as we know, there is no particular custom one way or the other.

FERROTYPES.—J. C. IRWIN asks: "What are the causes of an image not coming on a ferrotype plate? also, how long should it be kept in the silver bath? I kept a plate in for two seconds, then drained it, and put into a carrier and exposed three seconds, which, after being developed, showed no sign of anything. The solutions, I believe, are absolutely correct."—The cause of an image not developing is that the plate was not sensitised. It should have remained longer in the silver bath or until all apparent, greasiness is removed. This will take three or four minutes at this time of year. Three seconds will be too short an exposure unless the lens have a large aperture and the light is very good.

RED LIGHT FOR DARK ROOM.—ENLARGER writes: "Can you give me a cure for headache, or, rather, how to avoid it? I have to work the greater part of the day enlarging on bromide paper, and the rooms are lighted with deep ruby glass. I find, after working four or five hours, I get a bad headache, and I fancy it is caused by the light, as ruby light always tries my eyes very much. Have you heard of the light affecting others?"—Yes, a deep ruby light for long causes great inconvenience with many. However, a ruby light is not necessary for bromide paper. Substitute for the ruby a good sample deep-orange glass. By doing that, the trouble will most likely be avoided. A good orange glass will be perfectly safe with bromide paper.

SIZE OF STOPS.—C. KRONMAN says: "I have recently had a small lens remounted by good makers. Workmanship is excellent, but I cannot agree that the diaphragms have been correctly marked. I enclose card with full particulars, and shall be glad if you will give correct denomination of apertures in your reply column. Only three are marked by makers, but I should like to have value of all four."—If the lens was remounted by a good maker, it may be relied upon that the stops are properly marked. This you can ascertain for yourself by first finding what is the *equivalent* focus of the lens, and then a rule will do the rest. Bear in mind, stops are calculated from the equivalent, and not from the focus as measured from the ground glass.

ELECTRIC LIGHT FOR PORTRAITURE.—"Electricity" writes: "Can you tell me whether portraits taken by the electric light are usually successful, and whether there are many photographers in London who employ it? Would you advise me (a provincial) to go in for it?"—In reply: We are unable to say definitely whether it would be to our querist's advantage to adopt the electric light without knowing more of the circumstances. Certainly there is less necessity for it, generally speaking, in the provinces than there is in London, since the atmosphere in most provincial towns is much clearer. The employment of it might prove attractive as a novelty. Certainly its use is growing in London, and as good photographs can be, and indeed are, produced by the electric light as by daylight.

TESTING A LENS.—SPEC writes: "I have just bought a lens, which seems not to work to focus; at any rate, if I focus ever so sharply, I do not get a sharp negative in every case, although I do sometimes. How can I ascertain if this is so or not?"—In reply: This is very easily done by fixing up, say, a newspaper, in front of the camera in a sloping position so that the bottom is nearer the camera than the top. Then, with the camera level, focus accurately a blot of ink made in the centre of the paper, see that small type close to the blot is as distinct as possible. Before taking a negative, ascertain that the dark slide and focussing screen are in accurate register, and then expose a plate. Should the blot and adjacent type be the sharpest, the lens works to focus; but, should, on the other hand, the type nearer to, or farther from, the camera be that which is best defined, then the chemical focus is nearer to, or farther from, the lens than the visual focus, and an allowance must be made for such in focussing.

SPOTS ON ALBUMEN PAPER, C. C. PAPER, DRYING PLATES.—PHOTOPHILOS. "I fear I am almost abusing your indulgence in so soon again seeking your help, although it will probably cost your great experience but little to give me a reply on the following:—1. I have recently been much troubled with black spots (see sample), which make their appearance sometimes when the paper is dry from sensitising, sometimes only when it is taken from the printing frame. I should be glad to know cause and preventive. 2. You say English-made collodio-chloride will give a good image from very thin negatives, useful perhaps in portraits of young children. I should be glad to know the name of such a paper; also, 3, the name of some paper which prints rapidly, and is then developed, and with which prints similar in tone and surface to those obtained on albumenised paper can be obtained. 4. May the drying of plates be safely accelerated by the use of formol (or formaline)?"—1. The spots are caused by particles of foreign matter that reduce the silver either on the paper when it is floated or settling on it while drying. 2. Try the paper supplied by the Paget Dry-plate Company. 3. The same Company or the Ilford Company. 4. We should say so, from our experience of it. If the plates are put for a few minutes in strong spirits, they may be dried rapidly with moderate heat.

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EX CATHEDRÂ.

The Annual General Meeting of the members of the Royal Photographic Society was held on Tuesday, February 11, at 12, Hanover-square. The attendance numbered about 150, the rear of the room reminding us of the crowded state of the entrance to Drury-lane Theatre on a Boxing Night. Most of those present had, of course, come to witness Mr. Campbell Swinton's demonstration of "photography" with the X rays. The consequence was that the Annual Meeting was forced into the deplorable position of a *lever de rideau*,—it simply played the people in. The farce—for it was nothing more and nothing less—was rattled through in about five minutes, and, various matters affecting the interests and prosperity of a Society numbering close on 600 members having been thus handsomely disposed of, Mr. Swinton proceeded with his admirable demonstration.

* * *

We should have been sorry if the Society had had to forego what turned out to be not only an interesting, but an educational, demonstration and discussion on the photographic subject of the hour; but we certainly think that a strenuous effort should have been made to secure Mr. Swinton's kind help on some other night—say, the Monday or the Wednesday. Before now special meetings, devoted to photographic topics, have been held, so that there were precedents to fall back on. To put it plainly, the Annual General Meeting was, unintentionally we hope and believe, automatically burked. Somebody incurred the grave responsibility of providing for the one night in the year when members of the Society have an opportunity of discussing its position, prospects, and policy, a subject which robbed them of their rights and privileges. Looked at from any point of view, it was a blunder, and a bad one too.

* * *

Mr. S. Herbert Fry, whose address is 12, South-villas, Camden-square, asks us to state that he is authorised, on behalf of Messrs. Thompson & Co., Manchester, to exhibit and explain to photographic societies McKellen's Infallible hand camera, and is prepared to attend meetings with samples and working models. There are no charges for Mr. Fry's attendance.

* * *

Mr. R. H. Ramsay, of The Studio, Lerwick, who is himself a Shetlander, sends us a copy of a lecture to accompany a set of lantern slides illustrative of *A Visit to the Shetland Isles*. The book, which is well written, does not contain a superfluous word, which is more than we can say of most literary productions of this nature. The negatives and slides are the work of Mr. Ramsay himself. We are always glad to note and encourage enterprise on the part of our professional friends, many of whom, in the preparation of lecture sets of local scenery, have an opportunity of profiting by Mr. Ramsay's excellent example.

* * *

The *American Process Review* is the title of a "new illustrated monthly journal," devoted solely to the interests of all branches of process work. It is published in Toronto, Canada, by the Nesbitt Publishing Company, and is edited by Mr. George W. Gilson. We congratulate our brother Editor on his unique and refreshing candour. He says, in a prefatory note, "We have started this journal for two principal reasons: to make money for ourselves, and to be of service to the process-working trade." We wish him success in both ambitions. The first number is nicely printed and turned out. Useful practical articles on *Lenses for Half-tone Process*, and *Dry Plates versus Wet*, are among its principal contents.

It was a happy thought on the part of our energetic and enterprising contemporary, *The Stock-keeper*, to organize, in connexion with Cruft's Dog Show, at the Agricultural Hall, an Exhibition of Canine photography. The number, and in very many instances the excellence, of the exhibits surprised us. Professional photographers from all parts of the Kingdom were represented by examples of Canine portraiture, not merely photographically good, but indicative of a well-applied knowledge of the character and peculiarities of dogs, which lifts this kind of work to the level of a specialistic branch of photography that unquestionably admits of lucrative cultivation. Dog portraiture, in fact, is quite an art within an art.

* * *

Dog photography, however, is not the simple thing it sounds. The field it offers for camera work is a wide one, it is true, but the obstacles to success are at least as numerous as the opportunities. Peculiarities of breed and temperament, the "humanness," so to say, of the animals, their moods and instincts as well as their "points," have all to be studied before successful results can be hoped for, and the work obviously demands the exercise of skill and patience in no small degree. Many of the pictures that were shown failed in these essentials; on the other hand, it was pleasant to be able to appreciate the efforts of many professional photographers, who endeavour to portray their canine sitters to their best, that is, to say, their natural advantages. We shall expect this Exhibition to give an impetus to canine photography in particular, and to animal photography in general. A good photograph of an animal is surely more to be welcomed and valued by the "fancy" than a painting, which, at best, is only an ideal representation, more or less, of the original.

* * *

What, for convenience and intelligibility's sake, we must still call the "new" photography, has, during the last ten days, received much attention at the hands of medical men, and elsewhere in the Journal we record a number of instances in which it has proved of great value in surgical cases. The statements that instantaneous photographs have been taken by the X rays, and that an Italian professor has succeeded in devising a means of making the eye sensitive to those "rays," in the sense that it sees through objects which those rays penetrate, seem almost too remarkable to be accurate; but so surprising has been the development of the subject since Röntgen first mooted it, that an attitude of open-mindedness is the only safe one to assume in regard to these and similar revelations.

* * *

One phase of the subject is not without a somewhat comical aspect. We allude to the strange ideas which a great many of the non-photographic public appear to have imbibed with regard to the exact capabilities of the "new" photography. Innumerable journalists are evidently under the impression that hand-camera photographs of one's skeleton can already be taken with the facility attending an ordinary snap-shot. A more serious matter, however, is the fear which a professional photographer of our acquaintance assures is a real and growing one with many would-be sitters, that the operation of having one's photograph taken is accompanied by the risk that the lens and the dry plate at any time may "take it into their heads" to neglect our integuments and yield an unlooked-for and unwelcome representation of our "innards."

A notable addition to London photographic studios was made on Monday last, when the well-known photographer, Mr. Lyddell Sawyer, inaugurated the Dudley Studio, 219, Regent-street. The studio replaces one formerly situated on the same premises, with which the name of Samual A. Walker was for so long associated. The success which Mr. Sawyer has met with at Newcastle, the high position he has won in his profession, and his unquestioned artistic powers, fully warranted him in the boldness and decisiveness with which he has entered into competition with his London brethren, and we have every confidence that the Dudley Studio will speedily compel success.

* * *

The dingy old rooms have been entirely demolished, and, in their place, a fine suite of apartments has been constructed. A short, artistically contrived flight of stairs leads up to a noble reception-room, whence access is readily permitted to waiting-rooms, dressing-rooms, and studio, the latter commanding an uninterrupted north light, as it is out of proximity of lofty buildings; the electric arc light is also available. All the rooms are furnished and decorated in a sense of refined elegance and luxury, adorned with many examples of Mr. Sawyer's work, and are at once harmonious in colour and tastefully appointed down to the smallest detail. It has taken Mr. Sawyer many months to get his handsome studio completed, and we shall evade the difficult task of describing it by saying that he appears to have "let himself go" in the successful endeavour to give London possibly the most charming photographic studio it has yet possessed.

ANTHION.

Under the above descriptive title is introduced a new and useful auxiliary to the every-day work of the photographer. It purports to be a perfect eliminator of the last traces of hypo, or, to speak correctly, thiosulphate of soda, whether in the gelatine film of the negative or the paper print. Upon carefully testing this, and following exactly the simple instructions issued with each bottle, its claims as an effectual destroyer of the fixing agent are fully borne out. Anthion is a granular crystalline salt, exceedingly rich in oxygen, and sparingly soluble in water. Its solubility, in fact, is only one in two hundred, and the solution, if kept in a well-corked bottle, will be good for a month, but is slowly decomposed, even at ordinary temperature, giving off oxygen or ozone. It is presumably the persulphate of potash ($K_2S_2O_8$), and is thus a salt of persulphuric anhydride, the correspouding acid to which has never been isolated. According to Watts, potassium persulphate is obtained by passing a current of three to three and a half ampères for some days through a saturated solution of the acid sulphate of potash ($KHSO_4$) contained in a platinum dish, wherein is suspended a porous cell containing dilute sulphuric acid. The platinum dish stands in one of copper, through which a stream of cold water is allowed to run, and which is connected with the battery so that the platinum dish forms the anode. The kathode consists of a stout platinum wire immersed in the sulphuric acid. The granular salt, which gradually forms, is collected and dried. Potassium persulphate is decomposed by heat giving off SO_3 and O, whilst KSO_4 remains behind. Silver nitrate gives no precipitate at first, but a black silver oxide is afterwards thrown down, and the solution becomes acid. Potassium iodide is decomposed with the liberation of iodine, whilst

litmus and turmeric are bleached. By these reactions it will be seen that anthion is possessed of very similar properties to hydrogen peroxide.

Following the instructions, eighty grains of anthion were dissolved in forty ounces of lukewarm water. A half-plate negative, after fixing, was washed in about a pint of water contained in a porcelain dish. After five minutes' soaking, the plate was transferred to a second dish containing eight ounces of anthion solution, and allowed to soak, with occasional rocking, for another five minutes. This operation was repeated with fresh water and anthion solution, when it was found that every trace of hypo was removed from the plate. The test given in the sheet of instructions is to add a few drops of a twenty-grain solution of silver nitrate to an ounce or so of the last washing water, when, if the white precipitate which forms turns yellow, the hypo is not all eliminated. A more satisfactory and easy test is the iodide of starch. For this purpose a piece of paper sized with starch is brushed over with a very dilute solution of iodine in water. A violet colour is produced, which is instantaneously bleached if the slightest trace of hypo remains in the water. A drop from the corner of the negative, after about five minutes' washing from the last dish, was allowed to fall on the coloured paper, and the absence of hypo was shown by the violet colour remaining unaltered.

Of course, the fixing salt can also be discharged with equal facility from prints, and in this case several may be manipulated at the same time and a similar test employed. In the case of prints, however, it will be found handy to have a small bottle of dilute iodine solution at hand, when, by applying a drop to a corner of the print at the back, using a very small brush, or even a match, for the purpose, the violet stain characteristic of iodide of starch will appear if the hypo has been discharged.

It will be understood, however, that the instructions described are only for extreme cases, where the supply of water is very limited. If running water is available, of course it would be advisable to utilise it; but even then a short immersion in anthion makes the absolute elimination of the hypo a matter of certainty. In that case, even a little flowed over the washed negative, and allowed to soak in for a few minutes, will be found effectual. Especially when a negative has to be afterwards intensified with mercury, anthion will be found to be of great service, for then the least trace of hypo in the film will cause the well-known yellow stain, which cannot be eradicated.

The advantages of anthion will be readily appreciated, for it is, in its crystallised state, a stable salt, ready for instant use at any time, whilst nearly all the hypo eliminators hitherto employed are of varying composition and uncertain in their action.

Prohibited Sale of Paintings.—It is often said that "they manage things better in France." So they do, some things. Here is one of them: It appears that there is a law in France which prohibits the sale of any new article by public auction, except in the case of bankruptcy. For some time past there has been a daily sale, by auction, in Paris, of paintings in showy frames. The "pictures," it is said, are produced by a division of labour, one artist painting the skies, another the trees, and another the figures, and so on, at a few francs a day. The business proving so lucrative in the capital, it was being extended to the provinces. It is now, however, determined, in the interest of the natives, and artists, to put the law into force, and stop the sale of new paintings by auction. It is somewhat a pity we have not a similar law here, to put a stop to the sale of the miserable daubs, in showy gilt frames, at some of the mock auctions in London, where the unsuspecting public, mostly from the country, are so often taken in.

The North Pole.—During the past week the daily press has been teeming with reports that Dr. Nansen has really reached the North Pole—and doubts as to the fact. To get to the Pole has been the ambition of many expeditions during the present century, but up to the present—unless Dr. Nansen has got there—they have ended in failure. In the programmes of all the Arctic expeditions of late years has been photography, and a very complete equipment has always been announced as a feature in the paraphernalia taken out. When the expeditions have returned, although they have failed in their main object, we have heard little, and seen less, of the photographic results obtained, if any, in the extreme northern regions. Although the North Pole, or any other predetermined-upon point, was not reached, one cannot but suppose the photographic appliances were brought into use *en route;* but with what result? What photographers are interested in is, to learn how dry plates and films behave as to time of exposure and keeping qualities under extreme conditions of prolonged cold. It is to be hoped that we shall learn something in this direction from the Nansen enterprise on its return.

The Annual Guildhall Fine Art Exhibition.—The Sunday afternoon opening of this Exhibition has again been a topic of animated, almost personal, discussion with the Court of Common Council. A certain proportion of the Council are strenuously opposed to the Sunday opening, and some members regretted that the Ancient Corporation should be "sullied" by the Sunday opening; one read a verse from the Bible, and the result was to raise a laugh. In the end, on the vote, ninety-two were in favour of giving those who could not see the pictures on other days the opportunity of seeing them on Sundays, while sixty-nine were against it. Mr. Alderman Treloar, who has always been the champion of the Sunday opening of this loan Exhibition, is to be congratulated on his majority of twenty-three; many wish it were larger. The figures quoted at the meeting show that, on the thirteen Sundays the last Exhibition was open, 19,720 people visited it. Photographers who cannot get the time during the week to see this show will again have the opportunity of doing so once more on Sundays. It should be borne in mind that this Exhibition is of pictures loaned from the best private collections, and it is the only opportunity the general public have of seeing them.

A Novel Way of Exhibiting Photographs.—A very simple and inexpensive, though ingenious, way of displaying photographs, where wall space is not available, was that adopted by Mr. Welford, with the assistance of Mr. Fortune, at the Photographic Club and at the London and Provincial recently. As the system will be very useful to those societies which have perhaps annually a one-day show of members' work, and only require an extemporary arrangement, the plan deserves more than the notice it gets in the brief society reports. One of its great advantages is that any one who can use a hammer, nails, and a saw can construct the whole affair in a few hours. The idea is, we believe, Mr. Fortune's. Strips of wood, about a couple of inches wide and about half an inch thick, are nailed together to form frames of a convenient height and width, with one or two cross bars, which serve the double purpose of strengthening the frames and to suspend the pictures from. Strips of wood, suitable for the purpose, are stocked at most timber yards. When a number of these frames had been constructed, Messrs. Welford and Fortune, it was mentioned at the Club, were at a loss as to how they should be supported. Mrs. Fortune, however, came to the rescue by suggesting that they should simply be hinged together with webbing, like the domestic clothes-horse, and this was done. The whole affair is nothing but a many-leafed clothes-horse, which is self-supporting. Many thanks are due to Mr. Fortune's better half for the suggestion.

Adulterated and Impure Chemicals.—On Friday last a pharmaceutical chemist was, at the Marylebone Police-court, mulct in a penalty of forty shillings, and two guineas costs, for selling white wax adulterated to the extent of thirty-eight per cent. with paraffin. The defence put forward was that there were two kinds of wax, one containing paraffin, and the other pure beeswax. It was stated that it was the former mixture which was supplied to the public, while the latter was used for pharmaceutical preparations. Since the days of the wax-paper process, wax is but little used in photography, except for "encaustic pastes," and for waxing glass plates from which collodion films have to be stripped. For either of these purposes an adulterated article, such as that in question, would be totally unfit. Although the Poisons Act gives pharmaceutical chemists the monopoly of vending certain chemicals, it does not exempt them from the attentions of the Sanitary Inspector, and this is not the first time that "duly qualified" chemists have been fined for selling impure materials. By the way, when wax is required for photographic purposes, it is better to buy the best yellow beeswax, for, as a rule, that is a purer article than the more expensive white wax. If it can be obtained from a farm house where bees are kept, its purity can be relied upon.

Some little while back we ran out of cyanide of potassium, and wanted some at once. We repaired to a pharmaceutical chemist in the neighbourhood, who makes a display of cheap apparatus and photographic chemicals, when, after going through the prescribed formalities, we were supplied with a couple of ounces, for which we were charged the moderate price of one shilling. This turned out to be about the most impure sample of cyanide that ever passed through our hands. It required quite three times the quantity to redissolve the cyanide of silver formed from a given weight of the nitrate that our previous exhausted stock did, and which cost two shillings a pound. Commercial cyanide of potassium always contains some carbonate of potash, but it is priced wholesale, according to the proportion of cyanide it contains, and this varies from thirty per cent., or less, to ninety-five per cent. If the sample we were supplied with had been bought by the Sanitary Inspector, there is very little doubt that the vendor would have got into trouble.

Roughening the Surface of Glass.—The question of roughening the surface of glass has recently been referred to, hydrofluoric acid having been one of the means recommended, while, in the case of a negative the back of which it is desired to permanently "frost," as some term it, emery powder, worked with a wetted pad, has been said to be superior. If hydrofluoric acid be chosen, the gas should be employed in preference to the liquid, as it gives a surface of greater obscuration. When mechanical abrasion is made use of, it may be noted that the kind of glass to be treated greatly influences the amount of labour required. In a paper on the "Laws of Attrition," recently published in the *Royal Society's Proceedings*, we find, among a variety of other substances whose "attrivity" is given, that, taking quartz as 4, English plate glass is 5·7, and French plate glass 8·8, marble being 100.

Dark-room Illumination.—The last two or three years have seen, in the search after suitable orthochromatic screens, investigations into the properties of such a great variety of tinctorial substances, as regards their power of arresting various portions of the spectrum, that we think the time has arrived when some enterprising manufacturer might come forward, and make, on a commercial scale, a series of coloured screens, either of gelatine alone, or of glass coated with a series of suitable substances for arresting any selected portion of the spectrum. It has been shown that certain of the modern dyes are absolutely opaque to some particular rays; the gelatine sheets might be labelled in regard to the special portion of the spectrum which would not pass through, or, what might perhaps be more in favour with the non-scientific photographer, the makers could, in concert with an investigator familiar with the subject, vend one screen as being most suitable. Of course, a maximum of luminosity in combination with comparative safety would be aimed at. It is quite certain that the glasses and screens at present in popular use are selected mainly empirically. Some are excellent, some risky, some absolutely dangerous.

In connexion with this subject we may note a substance which we believe is new for the purpose, and which possesses valuable properties. We refer to naphthazarine, which, when dissolved in alcohol, will, according to E. Wiedemann and G. C. Schmidt, arrest green, blue, and violet rays. As this would leave the little active orange and the luminous yellow rays to pass through, it is possible that this substance alone might answer the required end. But it is one only of a large number which, alone or in combination, are capable of forming a screen as nearly perfect as possible. We commend the idea to those whom it may concern.

Acetylene.—It is quite evident that we have by no means heard the last of this illuminant. The newspapers "boomed" it to such an extent upon the first introduction on a commercial scale of the new mode of production, while there is now so little heard of it, that it might be supposed almost to have died a natural death, except for experimental purposes. It only needs the gas-compressing firm to send it out in cylinders to at once establish its use on a firm footing. It is remarkable that they have not already done so. Already, however, some firms are catering for possible consumers by the manufacture of gas-holders, and it is highly probable that others will follow suit.

There has been much loose writing upon the cost of the calcium carbide employed to produce it. It is credibly stated that at Spray, in North Carolina, it is made (by the passing of an alternating electric current through a mixture of lime and powdered coke) at a cost of twenty dollars a ton, that is, at the rate of about four shillings per hundredweight. As one ton of the carbide will produce 11,000 feet of the new illuminant, a fair idea of the comparative cost may be formed. This, however, must be qualified, if comparison with ordinary coal gas be made, by the recollection that the chief part of the charge of the latter is for "delivery at one's doors," so to speak.

But this is not all. We now read that the power from the Niagara Falls is to be utilised, works having been erected on the banks, which were expected to be in working order about the middle of this month, and to be able to produce the calcium carbide at ten dollars a ton—some papers state five dollars. Possibly the latter may refer to the actual manufacturing cost of production, and the former to the selling price.

The Röntgen Rays.—Variations upon the originally published process, and a search for similar effects from other sources continue to be made in every direction by investigators of every calibre. Lord Blytheswood, who explained at a public lecture how he nearly discovered the Röntgen rays some years ago, has succeeded in obtaining dry-plate images through "opaque" bodies without the use of either a coil or a Crookes' tube. He has a very large and powerful Wimshurst electrical machine, worked by a one-and-a-half horse-power engine. It gives a torrent of sparks a foot and a half or two feet long. Arranging his apparatus in a manner that need not here be explained, he obtained images upon a plate enclosed in the dark slide, and wrapped in four folds of black velvet. (Details may be found in last week's *Nature*, page 340.)

In contradiction of those who have stated that the light of the electric arc contained rays acting like those of Röntgen, M. Moreau, in the *Comptes Rendus* of the week before last, distinctly shows how the two radiations differ. A powerful arc lamp, of twenty ampères, exposed at a distance of about sixteen inches to an ordinary dry plate, wrapped in several thicknesses of black paper, showed no

result of light action whatever when developed, though, under the same circumstances, the Röntgen rays acted strongly.

M. Moreau used no Crookes' tube, but only the brush discharge from an induction coil. When the case holding the sensitive plate was placed normally to the brush, no action took place; when placed parallel to it, strong, clear negatives were produced. These results may throw much light on some of the recorded experimental failures.

CONTINENTAL STOPS AND THEIR U.S. EQUIVALENTS

PHOTOGRAPHERS are frequently troubled by the Continental nomenclature of the stops, and wish to know the U.S. equivalents for them. The method of finding this out is very simple. All that is necessary is to divide *f*-4 by the ratio to be converted, and square the result. Example: required the U.S. equivalent of *f*-9:—

$$\frac{f}{4} \div \frac{f}{9} = \frac{f}{4} \times \frac{9}{f} = 2{\cdot}25;$$

the square of 2·25 is 5·06, the U.S. number required. The following is a table of the Continental stops more commonly met with, and also the Continental values of the U.S. ratios:—

Ratios. *f* divided by	Continental Values.	U. S. Values.	Ratios. *f* divided by	U. S. Values.	Continental Values.
4·5	512	1·26	2·828	·5	1250
6·3	256	2·48	4	1	625
7	204	3·06	5·66	2	312
7·2	193	3·24	8	4	156
7·7	168	3·71	11·31	8	78
9	128	5·06	16	16	39
12·5	64	9·77	22·6	32	20
14·5	47	13	32	64	9·77
18	32	20	45·3	128	4·88
25	16	39	64	256	2·44
36	8	81	90·5	512	1·22
50	4	156	..	..	..
71	2	315	..	..	..
100	1	625	..	..	..

To find the *f* ratio for the U.S. values, multiply the U.S. value by 16, and the square root of the product is the required ratio. Example:—What is the ratio of U.S. 32? 32 multiplied by 16 is 512, the square root of this is 22·6, the ratio required.

To find the *f* ratio for the Continental stops, multiply the reciprocal of the square root of the Continental value by 100. Example:—What is the *f* ratio of the Continental value 16? The square root of 16 is 4, the reciprocal of 4 is ·25, which multiplied by 100 is 25, the ratio required.

Note:—The Continental ratios of 512, 256, and 8, ought to be 4·4, 6·25, and 35, respectively. The figures in the list are those extracted from Continental opticians' catalogues. EDWARD M. NELSON.

ON THINGS IN GENERAL.

WHAT profession or trade is there upon which Trilbyism has not left its mark the last month or two? That photography should receive the imprint is not to be wondered at, for how much would the general public know of the Haymarket exponents of the cult but for the aid of the camera worker? Every professional owes a debt of gratitude to Mr. Turner for the way he shows and explains to them how to nurse their productions to profitable ends. Why should the newspaper man have all the pickings, and the poor professional see his productions used to enhance the interest and profits of the illustrated journals? The reason is twofold. In the first place, the photographer whose works have never been exploited is so proud at the sight of his name in a paper which is circulated everywhere that he is quite content with the advertisement. This is mere rubbish. I know many professional photographers, and they all say they can never trace a penny increase in their business to any such source of publicity. The second reason is the idea that prevails among the great majority that the Copyright Union minimum of half a guinea is also a maximum. They don't read what is put before them. They should learn that the market value of a copyright permission is unlimited except at the half-guinea end. The popularity of the subject combined with rareness or difficulty of obtaining a negative are the governing factors. The papers are just as anxious to obtain interesting photographs, as to be first in the field with news, and equally to pay—that is, when they can't get them for nothing.

If the now famous Röntgen ray sciographs had been made copyright, a very large sum could have been obtained for sole permission to use them as soon as the rays were "boomed." And what a boom there is and has been! It is marvellous how the public will have the last new thing in science; the less they know about it the greater their interest. Colour photography is quite left out in the cold. If it had not been for Röntgen, the last new paragraph about the Chicago experimenters would have furnished pabulum for scores of leading articles on a subject which has hitherto been one of perennial interest. But, so far, not a line seems to have been written. A feeling appears to be gaining ground that photography, as applied to Röntgen's priuts, is an entire misnomer; that electricity, not light, is the factor. It may be either or both, for all we know, at present; but we do know, from the consensus of experimental product, that the exhibited results are, in the main, legitimate, and free from sophistication, though I must call attention to one print—a hand, one of the fingers of which is ringed. The process-block print represents the flesh *outside* the ring, and not as a crease where the ring has become embedded in the course of time, for the contour of the fleshy part of the finger is unbroken. The Röntgen prints are essentially legitimate; but what are we to say of Mr. W. Ingles Rogers's eye pictures? Briefly, he fixed his gaze for a long period on a postage stamp, then held a plate in a similar position as regards his eyes, and gazed upon it equally intently and long. On developing the plate, a distinct image of two postage stamps appeared, the theory being that the original retina impression was of such a character as to be able to emit actinic force, and sufficient to impress a plate. I should be sorry to brand any alleged scientific experiment as worthless, but I may at once say these eye prints cannot be admitted as genuine unless a reasonable explanation of certain difficulties is offered. Thus, firstly, why did the eyes produce two images? If they retained the position they had during the gaze on the stamp, there should be only one image instead of two, for the optic axes would converge to a point, and, if the retinæ were luminous, their luminosities would be focussed on that point. The reply may be that the sensitive plate was in the dark (he does not specially say it was not, in the case of the stamp) while being gazed at. It is known that, when a person is asleep, his eyes are usually focussed for distant objects, and it is generally the case that the focussing of the lens of the eye and the greater or less converging the axes are almost involuntary and synchronous; hence, if Mr. Ingles Rogers's eyes were in the dark, their axes might be parallel, and then, of course, two, if any, images would be given, and the focussing would be for distance. This, the only feasible explanation, is open to the objection that, if the eyes were focussed for distance, the issuing rays would form no image at all, as they would be parallel. Mr. Ingles Rogers is on the horns of a dilemma on these counts alone. Let us grant that the eyes were not focussed for distance, and that, by some inexplicable means, he can turn his eyes outwards, and keep them so and immovable for a third of an hour, he has to face another difficulty. If retina, eye, and plate were similarly placed as retina, eye, and stamp, the image of the stamp ought, by the laws of conjugate foci, to project its luminosity on to a space exactly the size of the original stamp, whereas, in the view printed, it is about half a centimetre high, or one fifth of the true size. I don't think Mr. Ingles Rogers will be heard of again.

Messrs. Haddon and Grundy are giving us the results of some more of their invaluable experiments. With regard, however, to the solubility of silver in hypo in the presence of air not having been previously observed, it is very probable that they are correct, so far as a scientifically expressed statement is involved; but I think many

photographers must have been practically acquainted with the fact, seeing that a negative fresh from the hypo reared up to dry will lose very considerably in strength in twenty-four hours. Of course, this is not a proof that metallic silver has been dissolved, though it is probable that such is the case.

What a huge pother has been created over a simple matter—chemists and the sale of poisons. The matter lies in a nutshell, and is really outside any real disputation. The supreme legislature of this country, with the best advisers to help them, devised a scheme to diminish the risk of poisoning by misadventure or otherwise, and passed an Act rendering it illegal for any but a man who had passed a certain examination to sell certain poisons. The men who pass these examinations are those who keep chemists' and druggists' shops, and the only object of passing the examinations is to enable them to sell these poisons, either in making up prescriptions or open sale. Can any one say that it is fair to these traders, who have to go to great expense and give much time to qualify for the examinations, to render this perfectly nugatory, and wasted money and time, by permitting the sale of poisons by any other than such qualified men? Let us all be reasonable and just over the matter. Get the law altered, if desirable; but don't throw a great burden on an honest trader and give him no benefit from it. Incidentally one writer says he cannot get as pure chemicals from a "chemist" as from a photographic dealer. It is mere rubbish to talk in that strain.

We have had some really valuable hints about dark-room illumination of late, which, read with judgment, should be of aid to almost every one. I say with judgment advisedly, for an amateur was heard to say the other day that all he could learn from recent talk about dark-room lights was that yellow and other windows would fog, and that the proper light to change plates by was an ordinary unshaded candle.

This remark was probably brought about by reading the well-worn dictum that there is no such thing as a "safe light, and it is all a question of time." No photographer of scientific attainments would doubt the truth of this dictum, which, expressed in other words, is that, give it time enough, a gelatine plate is sensitive to all luminous (not to speak of invisible) radiations. This being, as it undoubtedly is, absolutely true, I am constantly marvelling at the crass stupidity of some writers who assert that orthochromatic effects cannot be obtained, even by the aid of screens, on ordinary plates.

I will conclude my lucubrations by calling attention to the cool impertinence of a correspondent "Amateur (London, N.W.)," who wishes to know if it is not unfair for a professional to charge a stiff price "to one who knows the cost of everything used" for taking a first-class negative that he, the amateur, may print copies from for his friends? Putting aside the fact that this amateur is extremely unlikely to know anything whatever of the cost to a professional of taking a negative, one is inclined to ask whether he ever grumbled at having to pay a guinea for a first-class prescription from a first-class doctor when he well knew the cost of his ink and paper?

FREE LANCE.

ELECTROGRAPHY.

MOST of the periodicals have given some notice on the subject of the "new photography" (so misnamed) based upon the alleged discovery of so-termed "Röntgen rays." This has been quite a mania. I have already pointed out in this JOURNAL that distinct images derived from electric induction have been obtained by Professor Draper through intervening opaque substances more than thirty years ago. The recent impressions appearing in support of the existence of such "new rays" are mere hazy shadowgrams. The advocates of newly discovered rays are in a state of perplexity concerning them. They are stated as not refrangible, and therefore not in the spectrum, but somewhere outside, and so cannot belong to it; therefore the lens maker is unable to utilise them optically for picture-making, and consequently results must be more imperfect as distance is increased. The most distinct impressions are those in which prints have been obtained with the object in close proximity to the sensitised surface. The exciting agency is electric induction. When an object is placed in the field of an electric discharge, certain parts, either external or internal, of various degrees of density or conductivity either facilitate or obstruct the passage of the radiations, and so cause a difference in the impression that will result in a picture of the structure.

Improvements may be advanced in two directions. First, by concentrating the energy of the electric discharge. Continuous sparking is not so proportionately energetic; a quiet, continuous current is more productive. For this a simple printing frame may be constructed from a wooden box, the interior of the lid to be either insulated or not. This should be furnished with a pendent group of sharp pin points, and the bottom similarly provided with receiving points. On connecting the lid with the conductor of a Wimshurst machine in operation, a quick, non-luminous discharge will take place between the points, and the object to be copied is superposed upon the sensitive plate, both being laid in the closed box.

Secondly, as to the chemical nature of the sensitive plate. Although unquestionably the presence of weak electrical currents will affect ordinary photographic plates, yet there may be materials that are relatively insensible to light, but highly sensitive to electric influence.

Starched paper sensitised with potassium iodide is usually employed for electric indications, as in the ozometer; or, if a point emitting electricity is traced over the surface, a blue line will follow from the liberation of free iodine, which colours the starch. This is a common test for either. The decomposition of the iodide is probably due to the liberation of a minute trace of nitric acid from the air, which always accompanies a free electric discharge. On account of its blue colour this impression is not well adapted for printing from, and is rather fugitive. The discovery of a compound that is highly sensitive to free electric radiations, and which can be developed to a dark tone, and be duly fixed, is quite within the province of the photographic chemist.

I now end the subject. I adhere to the free electric induction theory, which alone accounts for every result, and leave the "new ray" advocates to prove some separate influence, if they are able to do so, the evidence of which at present is very unsatisfactory.

F. H. WENHAM.

THE "NEW PHOTOGRAPHY."

INSTANTANEOUS photography with the X rays.—In the experiments at Toronto University, Herr Röntgen's X rays are focussed downwards by a glass bell over the Crookes' tube, thus enabling instantaneous photographs to be taken. Trinity College, Hartford, reports the appearance of photographic halation, indicating a reflection of the X rays. Mr. Edison believes that some experiments upon which he has been engaged indicate a method of hardening and tempering aluminium to the quality of steel.

LAST week, at Queen's Hospital, Birmingham, a successful operation was performed with the aid of the Röntgen rays. A fortnight ago, a Mrs. Berry ran a needle into her hand, and the hand became much swollen. Dr. Hall Edwards took a photograph of the hand, and the needle was clearly seen. The operators extracted it with the aid of the print, and speak highly of the assistance it had been to them.

Dr. McKenzie Davidson, of Aberdeen, has utilised the Röntgen rays for the removal of a needle from the foot of a patient. The needle was only one inch long, and when its exact position had been detected by means of shadowgrams obtained by the rays, it was extracted by the medical gentleman.

DR. J. J. THOMSON has discovered an even more delicate test for the presence of these rays than the photographic plate, as he finds that, if a metallic electrically charged plate be perfectly insulated and even bedded in paraffin, ebonite, sulphur, or other non-conductor, and then exposed to Röntgen's rays, it rapidly loses its charge, whether such charge be positive or negative. This fact is particularly interesting, as showing that all substances through which these rays are passing become for the time being conductors of electricity. It has been asserted by other observers that it is by no means necessary to provide oneself with a Crookes' tube and the necessary electrical apparatus, as the light from a few inches of burning magnesium ribbon, and even from less intense sources of light than this, evolve certain rays which are also capable of passing through opaque bodies, such as wood, and impressing themselves on a photographic plate beneath.

MUCH attention is being given at Rome to the discovery made by Professor Salvioni, of Perugia. An instrument called a cryptoscope adapted

to the eye enables the vision by means of the Röntgen rays to penetrate opaque bodies. It is stated that Professor Salvioni is perfecting his discovery, which will acquire as much importance as that of Röntgen's itself. The experiments hitherto made are of the most conclusive character. The retina of the eye is impressed by means of the cryptoscope exactly in the same way as a photographic plate.

The first practical demonstration in a London hospital of the Röntgen discovery in regard to a living subject was given last week at St. Thomas's Hospital, before the members of the Medical and Physical Society. Dr. Mackenzie, one of the assistant physicians, presided, and was supported by a large gathering. The experiments were conducted by Mr. A. F. Stanley Kent, late demonstrator of physiology, who briefly described the new process. The first experiment was a most interesting one to those present. The subject was a young medical student of St. Thomas's, who, during the day, had had the misfortune to break one of the fingers of his right hand. This hand was photographed, and the plate when developed showed the exact position of the fracture in the bone of the finger.

Dr. Carlton Simon, of New York, a pupil of Charcot, has, it is said, stolen a march on Mr. Edison by inventing a process which has enabled him to photograph his own brain. For three years past Dr. Simon had been working quietly towards his end. Reports of Professor Röntgen's discoveries and Mr. Edison's experiments hastened his researches, and last wtek his labours were rewarded by results which, though still incomplete, were fairly satisfying. An ordinary camera with platinum plates (*sic*) was employed. Dr. Simon is not yet prepared to explain his process in detail. In making a statement to an interviewer, however, he said: The rays I use in conjunction with sound, and they are electric rays so far as the light is concerned. I produce the effect by attraction of the light and propulsion through the brain substance. At the time of photographing the whole internal chamber of the brain is illuminated. My discovery is not consequent on the application of the cathode ray to photography.

The *British Medical Journal* publishes the second part of the report by Mr. Sydney Rowland on the application of the new photography to medicine and surgery. New light must be thrown on the problem of the tube and its adjustment to the current before the new method can be accepted as a means of clinical diagnosis. A photograph of a human foot by Mr. Rowland shows very clearly the nature of the bone changes and the atrophy produced by the wearing of tight boots; and there can be little doubt that the new methods, if they can demonstrate positively the injurious changes wrought in the texture and structure of the human body, will make more powerfully for health than any agency we have previously known.

From inquiries made at some of the principal metropolitan hospitals, it appears that preparations are in progress at several for experiments with the Röntgen rays. Dr. Bellington Smith, Surgical Registrar at Guy's Hospital, stated that in the electrical department active preparations were being made in the direction of constructing the apparatus necessary to conduct the experiments by the new process. Considerable difficulty had been experienced in getting vacuum tubes of sufficient strength for the purpose, but it was hoped the apparatus would be quite complete in a few days' time, and experiments would be made as suitable cases came forward. As to the invention itself, Dr. Smith said he thought it would be extremely useful in determining the position of a needle embedded in the hand, a class of accident that was very common in connexion with public hospitals. It would be a benefit also in assisting physicians to find out the position of a new or old fracture of the bones of the leg or arm; and, further, it would prove of great help in finding the position of a bullet in limbs of the body. About a year ago, a man was admitted to Guy's on his return from Africa, where he had received a wound in the head from a bullet, part of which remained in his skull, and very great difficulty was experienced in extracting the missile. In such a case as this the new invention would have been of great service.

Mr. A. W. Porter, the Lecturer on Physics at University College, said he had been repeating a great deal of Professor Röntgen's work, both as regarded verification and also the extension of it. There seemed to be some hope of settling the question soon as to the nature of the rays with which the photographs were taken. He had been successful in obtaining some of the "sharpest" photographs under the new process that had yet been procured in England, and probably with the least power and with the shortest exposure. His maximum time for exposure was two and a half minutes, and he had obtained some very excellent results. Attempts to take thick objects, such as the vertebræ, had failed up to the present, owing to the radiation becoming diffused through the thick obstacle, and probably, owing to this latter fact, the use of the new process in surgery would be of a limited nature. In conclusion, Mr. Porter said that dozens of medical men had visited the laboratory to witness the experiments, and very great interest was being taken in the matter.

Professor O. J. Lodge, at the University College, Liverpool, the other night, is reported to have said it was now proved that Röntgen's rays were not streams of electrified matter, but it was quite possible that some crucial experiment might soon be made which would set at rest the present doubts as to the merit of the remaining hypotheses on which the discovery was to be explained. If the rays were ultra-violet light, high up in the scale of the spectrum, it was probable, judging from their effects, that the rapidity of their vibration was a million times greater than that of ordinary light, or about as much more rapid than light as light was more rapid than sound. There was some evidence in favour of this, since the rays were able to discelectrify negatively charged bodies. At present, however, he thinks the rays are longitudinal waves in the ether. If so, the discovery would open up a department of physics as large as light, sound, or electricity. Professor Schuster pointed out the fact of Newton having held that fine particles of light could pass through opaque substances. It was now established that light and sound were transmitted with differing speeds through varying substances. Here, however, were rays which seemed to go at almost the same speed through everything, and which were not acted upon by a lens. There was a feeling on the part of physicists that in these rays we were on the eve of a discovery of something which links the hitherto isolated force of gravity with that of the higher forces of nature.

THE TRAILL TAYLOR MEMORIAL.

Fourth Subscription List.

	£	s.	d.
Britannia Works Co.	5	5	0
Photographic Times (New York)	2	2	0
Birmingham Photographic Society	2	2	0
Richmond Camera Club	1	1	0
Mr. J. W. Gifford	1	1	0
,, F. Ince	1	1	0
Major Lysaght	1	1	0
Mr. J. J. Walker	1	1	0
,, J. Nesbit	1	1	0
Dr. J. J. Acworth	1	1	0
Messrs. Window & Grove	1	1	0
Mr. E. W. Foxlee	1	1	0
,, W. Barry (Hull)	1	1	0
,, H. J. Burton	1	1	0
,, J. W. Marchant	1	1	0
,, G. Seamell	1	1	0
,, G. Watmough Webster	1	1	0
,, P. Everitt	1	1	0
,, E. Clifton	1	1	0
,, G. W. Atkins	1	1	0
,, G. Bankart	1	0	0
,, G. R. Baker		10	6
,, A. Glendinning		10	6
,, J. E. Shaw		10	6
,, T. Bromwich		10	6
,, A. Levy (Paris)		10	0
Per Mr. George Mason—			
Mr. George Mason (Glasgow)	5	5	0
,, John Stuart ,,	2	2	0
,, John Spencer ,,	2	2	0
Messrs. T. & R. Annan & Sons (Glasgow)	1	1	0
Mr. W. Lang, jun. (Glasgow)		10	6
,, J. L. Cox (Glasgow)		10	6
,, A. A. Inglis (Edinburgh)		10	6
,, John Henderson (Perth)		10	6
,, A Brown (Falkirk)		10	6
,, W. M. Rodgers (Stirling)		10	0
Per Mr. H. W. Bibbs (Edinburgh)			
Mr. W. Crooke	1	1	0
,, R. Ayton		10	6
Amounts under 10*s.*		19	0
	£47	1	0

REPORT OF THE PLATE-SPEEDS COMMITTEE

[Royal Photographic Society.]

To the Council of the Royal Photographic Society.

Your Committee have to report that, appointed by Council on April 25, 1894, *to consider and report upon the best method of determining plate speeds*, they have given the matter their consideration.

The difficulty which they encountered at the very outset of their work lay in the apparent impossibility of defining the phrase *the speed of the plate* in a sufficiently explicit manner, at the same time keeping the definition wide enough to embrace what is usually meant by the term.

Your Committee found that practically four systems of plate-speed measurement were before the public, which might be described as those

of:—Captain Abney, Messrs. Hurter & Driffield, Mr. Spurge, Mr. Warnerke (there are also two systems recommended in 1889 and 1891 respectively by the International Congress at Paris and Brussels) and a series of experiments were undertaken with a view to ascertain whether these four systems, differing widely in method, yielded accordant or discordant results. It was soon thought necessary, for the purposes of comparison, to lay down a definite constant development, and your Committee agreed that their experiments should be conducted by developing at a temperature of 70° Fahr. for four and six minutes with a developer of the following composition:—

Pyrogallol	2	grammes or	2 grains.
Potassium bromide	0·5	,, ,,	0·5 ,,
Anhydrous sodium carbonate	6	,, ,,	6 ,,
Crystallised sodium sulphite	20	,, ,,	20 ,,
Water	437·5 c. c.	,, ,,	1 fluid ounce.

Working under these conditions, two plates of different make were tested by the Committee with a view to ascertain their relative speed by various methods, and it was found that all these gave identical results except one, the speed ratio of the two by three methods being given as 5 : 1, by a fourth as 9 : 1.

Further experiments using the same developer, but, instead of developing for a fixed time, continuing the development until fog appeared, showed that this concurrence in the case of the two plates was probably accidental, since the readings of six plates differed widely, as shown by the table below.

The vertical columns give the various readings of each of the plates 1, 2, 3, 4, 5, and 6, the horizontal columns give the readings by any one experimenter of the set of plates, the speed of plate 1 for purposes of comparison in each case being taken as 100.

Experimenter.	Plate number.					
	1.	2.	3.	4.	5.	6.
A	100	12·3	65	0·19	23	14
B	100	9·7	33	0·23	10·5	10·5
C	100	12	20	1·7	14	6
D	100	18	45	2	40	12
E	100	14	25	2	14	10
F	100	16	31	2	31	10
G	100	31	50	0·16	31	12·5
H	100	20	33·3	0·39	28·5	5·26

From this it will be seen that even the order of their rapidity differs by various systems, the order being as follows (the fastest being put first):—

A ... ... 1 . 3 . 5 . 6 . 2 . 4.
B ... ... 1 . 3 . 5 . 6 . 2 . 4.
C ... ... 1 . 3 . 5 . 2 . 6 . 4.
D ... ... 1 . 3 . 5 . 2 . 6 . 4.
E ... ... 1 . 3 . 2 . 5 . 6 . 4.
F ... ... 1 . 3 . 5 . 2 . 6 . 4.
G ... ... 1 . 3 . 2 . 5 . 6 . 4.
H ... ... 1 . 3 . 5 . 2 . 6 . 4.

Your Committee would emphasise the fact that these differences were obtained with the use of identical developers.

Your Committee have to report that, so far, they cannot see a way to recommend any system of speed determination without the employment of identical development both for the test and for the subsequent use of the particular plate in question.

Your Committee have also to report that for reproduction by photography, where accuracy is required, they are unable to see that exposures described by Messrs. Hurter & Driffield as belonging to the period of under-exposure and to the period of over-exposure are of any value whatever, although they might, on the other hand, be of utility under some circumstances.

PHOTOGRAPHIC SOCIETY OF IRELAND'S EXHIBITION.

Last week the annual Exhibition in connexion with the Photographic Society of Ireland was opened in the Society's Hall, 35, Dawson-street, by the Countess Cadogan, in the presence of a large assemblage of ladies and gentlemen. The number of exhibits exceeds 500, the increase on previous years being largely due to the introduction of a new department, which embraces a splendid collection of Irish scenic views gathered together as a result of a competition held in connexion with the Exhibition under the joint auspices of the Irish Tourist Association and the Royal Dublin Society to exploit the picturesque parts of the country as a happy hunting ground for folks who indulge in holiday travel.

On entering the hall, we were struck by the fine case of photographic appliances exhibited by Messrs. Curtis Brothers, of Suffolk-street, Dublin. Their well-known Trinity hand camera is shown, together with a number of photographs taken by it, which bears testimony to the high-class results which are obtained by its use—we notice that there are some good improvements made in the '96 pattern. Another article which this firm have introduced is specially refined and washed hypo, put up in neat drums, in quantities of 1 lb.; the crystals are very small, which dissolve quickly. We noticed a number of fine results taken on the Gem plates, which prove the great rapidity of these plates. There is a very fine folding Kodak shown, of whole-plate size, also the new Kodet. Amongst other things with which we were struck is a very nicely got-up Russian iron lantern, which is a really practical instrument, having all the necessary adjustments. There were many more of this firm's specialities, too numerous to mention, all of which made a most effective display, for which they deserve great credit.

In Class I., for landscapes, Mr. George Mansfield, J.P., Morristown, Naas, a past President of the Society, has secured the silver medal for a beautiful series of river and tree scenery of refined and delicate outline, foremost amongst which is a fog study of exceptional merit. Mr. J. M. Keogh wins the bronze medal with some pretty examples of land and water effects, and a cottage scene from Lough Derg, near Kilialoe. Mr. A. E. Horne, R.M., secures honourable mention for a number of river scenes from the West of Ireland. In Class II., for pictorial subjects taken with hand camera, Mr. J. M. Keogh wins first prize for some admirable snap-shots of scenery at Llanberris, North Wales. Mr. H. Goodwillie obtains second prize for yachting subjects at Kingstown, embodying some fine cloud effects. In Class III., for hand camera work on street scenes, the silver and bronze medals fall respectively to the lots of Mr. J. M. Keogh and Mr. J. Simpson, the subjects being photographed by both during a tour in Normandy, and including quaint street and seaside selections and churches, which will be inspected with interest, and Mr. Goodwillie is honourably mentioned. In Class V., for architectural and archæological subjects, the exhibits are specially attractive, and Mr. J. A. C. Ruthven, Secretary to the Society, wins the silver medal for a series of pictures depicting buildings taken in Shrewsbury during last year's Photographic Convention in that town. An impressive sample of the cunning shown by the winner in the manipulation of the camera is found in the picture of Buildwass Abbey, and other kindred landmarks of the past are no less effectively dealt with. Mr. H. Goodwillie was awarded a bronze medal for tasteful Irish views and a first-class picture of Cologne Cathedral. Mr. J. W. Kelsall obtained honourable mention for some capital reproductions of archways of the ninth-century period. Class VI. is devoted to lantern slides of landscapes, which, of course, are not "hung," but will be exhibited with limelight each evening of the Exhibition. The silver medal was won by Mr J. Simpson, and Mr. G. M. Roche was the winner of the bronze medal, Mr. J. A. C. Ruthven receiving honourable mention. In Class VII., for lantern slides other than landscapes, Mr. J. Simpson won the silver medal, and Mr. J. M. Keogh secured the bronze medal, Mr. Goodwillie receiving honourable mention. In Class VIII., for members who never before won a prize Mr. J. H. Gane won the silver medal for a dainty bit of river scenery, and honourable mention was divided between Mr. M. F. Keogh, whose Alpine scenery examples were capital, and Miss Ida Lynch, whose pictures were mostly taken in Malta, were very artistic.

In the Champion Class, which, unlike the foregoing competitions, was open to others than members of the Society, Mr. W. M. Warnerke, of Glasgow, won the silver medal with a really brilliant study of the sea at Iona, the beautiful sky conditions, the strand, and the waves being brought out with charming richness, while the picturesquely clad fisher girls, gracefully posed in the foreground, were done more than usual justice with the camera. Mr. Howard Esler obtained the bronze medal for a splendid conception of autumn. The Werner medal, for the most artistic picture on exhibition, was won by Mr. George Mansfield with an exquisite river scene. A unique feature of the display is a series of pictures by Mr. Goodwillie, representing the various periods of the spectacle of the "Buffa" parade at the military tournament last year in Ballsbridge, which, having regard to the bad light available in the interior of the building, was singularly successful. Mr. G. M. Roche has on view an interesting view of the recent shipwreck at Kingstown. In the Irish Views Department in connexion with the tourist traffic, a high standard of artistic treatment has been reached. The first prize of 5*l.* has been won by Mr. J. A. C. Ruthven for a splendid picture entitled *Evening on the Liffey*, which depicts, with great boldness and excellent perspective details, the river as seen from the Howard side of Carlisle Bridge. One of Guinness' steamers is alongside the quays, and the twilight sky is most happily portrayed. Mr. F. C. Curry, Liamore, wins the second prize of 3*l.*, his exhibit being *Ounashed Glen*, an impressive study of boulder and bush in rugged grandeur. Mr. E. E. Barrow is awarded the third prize, value 2*l.*, for a view of the *Happy*,

Family Mountains at Killarney, in which lake, mountain peaks, and sky combine to form a majestic piece of landscape work. Thirty certificates will also be awarded in this competition, which entitles the exhibitors to receive 10*s.* 6*d.* as fee for right of reproduction. Examples of colour photography are also shown, and prints depicting the results of Röntgen's new discovery of photography, which will penetrate opaque objects, also found a place in the Exhibition.

JUDGES' REPORT ON THE WATKINS DEVELOPING COMPETITION.

We have been given to understand that about one hundred entry forms were sent out to intending competitors, but the actual number competing was only seventeen. Some of these, however, sent in several sets of negatives. In many instances the conditions of the competition were not complied with.

In going over the matter again, at the request of the members of the Photographic Club, we see no reason to alter our award to Mr. B. J. Edwards, or to Mr. Ben Edwards, for the greatest difference in gradation, but we have decided to make a further award of one pound for a similar result to Mr. John Sterry.

We did not find any instance, where strongly dissimilar developers had been used, that the gradation was the same. It is worth noticing that, in most cases where strongly restrained developers had been used, half of the plate presented a much more glossy appearance. It is also worthy of note, where two halves were exposed identically, one developed with a normal developer, and the other with a developer much restrained, the latter is quite free from halation, whilst in the former the spaces are eaten up with it.

In some cases the formula given was so complicated that it required very abstruse calculations to arrive at the component qualities. In another case trade developers had been used, the constituents of which were not known to us. Although it was not permitted to use reducing agents, yet one competitor treated an exposed plate to the action of bichromate of potass, which, of course, had the effect of destroying the latent image, and so played the part of a reducing agent.

In those cases where the results were similar, the developer was not of such varying strength as to come under a widely varying developer.

We think the results of the competition open up a new field for further experiment as to the real action of a highly restrained developer.

In the case of the negatives sent us to adjudicate upon, there appears no room to doubt that the scale of gradation has been altered.

J. B. B. Wellington,
F. A. Bridge.

January 21, 1896.

News and Notes.

Messrs. C. M. Higgins & Co. are putting on the market a special brush for their photographic mounter.

Mr. A. H. Bennett, of 137, Normanton Road, Derby, writes: "Please note that I have been appointed Hon. Secretary of the Derby Photographic Society in place of Mr. T. A. Scotton, resigned."

We are informed that the competition slides entered at the South London Photographic Society's Exhibition (March 2–7, 1896) will be shown by the electric lantern, the lamp for which will be provided by Mr. R. R. Beard.

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock, on Wednesday evening, February 26. Travellers' Night. A lecture, with lantern illustrations, entitled *A Trip through Brittany*, by Mr. Henry Sturmey. Visitors will by welcomed by the members.

Royal Photographic Society.—Technical Meeting on February 25 at 12, Hanover-square at eight p.m. *The Stereoscopic Photo-chromoscope*, by Mr. F. E. Ives. *Messrs. Newton's Simple Method of Projecting Stereoscopic Pictures*, by Mr. T. E. Freshwater, F.R.M.S. *Stellar Photographs taken without a Driving Clock*, by Mr. J. Lunt, B.Sc., F.C.S.

Lantern Society (20, Hanover-square, W.).—Meetings will be held as under at eight p.m.:—February 24, *Lantern-slide Making as an Art*, by Mr. J. A. Hodges, F.R.P.S. March 9, *The New Photography*, by Mr. H. Snowden Ward, F.R.P.S. 23, *The Scottish Alps*, by Mr. Lamond Howie. Invitations to the meetings can be obtained on application to the Hon. Secretary, J. Bashall, 21, Holland-villas-road, Kensington, W.

Messrs. Smith & Brown, Photographers, &c., of Sounthorpe, write: "Our attention has been drawn to your account of introduction of the flash-light at Bournemouth last week. The experience of the South Coast Photographic Supply Association has repeated itself with us. We introduced a flashlight of considerable power into our business last week, and on Wednesday night used it for the first time; the flash so startled the people passing along the roads in the vicinity of our studio, that many rushed to the premises and endeavoured to break open the door, thinking the place was on fire, but in our case the fire brigade could not turn out, as our town does not possess one. It is needless to say it was a false alarm."

We have received the following communication from Mr. Herbert Goodchild, Solicitor, of 27, Castle Meadow, Norwich:—February 14, 1896, Mr. Robert Leamon Kidd, deceased. On behalf of Mrs. Alice Mary Kidd and myself, executors of the late Mr. Robert Leamon Kidd, I hereby give you notice that we have recently sold to Messrs. Ernest Charles Morgan and Harry Martin Dennes, of Richmond, Surrey, all the share and interest of the above-named deceased in the firm of Morgan & Kidd, of the Argentic Works, Richmond, Surrey, and that from henceforth Messrs. Morgan & Dennes are the sole proprietors of the said business, and will liquidate all liabilities.

Patent News.

The following applications for Patents were made between February 3 and February 8, 1896:—

Films.—No. 2415. "Improvements in Photographic Films to be acted on by Röntgen Rays." T. A. Garrett and W. Lucas.

Developing Trays.—No. 2494. "An Apparatus to be used in connexion with the Developing of Photographic Negatives." J. Lewis.

Focussing Scales.—No. 2554. "Improvements in Focussing Scales for Photographic Cameras." T. M. Clark.

Dark Slides.—No. 2601. "Improvements in Dark Slides for Photographic Cameras." E. Pocknell.

Cameras, &c.—No. 2607. "An Improvement in Photographic Cameras, Hand Cameras, and Changing Boxes for the same." S. P. Hyatt.

Lantern Slides.—No. 2671. "Improvements in and relating to Magic-lantern Slides." W. C. Pexton.

Colouring Photographs.—No. 2711. "Improvements in Painting and Colouring Photographs, Prints, Drawings, and the like." M. Williams.

Lanterns.—No. 2820. "Improvements in connexion with Magic Lanterns and the like." S. H. Cousins.

Dark Slides.—No. 2821. "Improvements in connexion with Photographic Dark Slides or the like." R. E. Eggleton.

Developing Plate-holder.—No. 2833. "Photographic Developing Plate-holder." W. J. Windrum.

Dark Slides.—No. 2921. "Improvements in Quadruple Photographic Plate-holders." Complete Specification. E. G. Cone and D. R. Close.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
24	Croydon Camera Club	Rehearsal of Members' Slides for Exhibition on 26th.
24	Lantern Society	*Lantern-slide Making as an Art.* J. A Hodges, F.R.P.S.
24	North Middlesex	*Preparation of Collodio-chloride and Plain Salted Paper.* G. H. Moss.
24	Richmond	*Collodio-chloride Paper.* L. Taylor.
25	Birmingham Photo. Society	Open Lantern Evening.
25	Bournemouth	Lantern Night.
25	Brixton and Clapham	*Retouching, and the Improvement of Negatives.* Part I. Portraits. R. C. Whiting.
25	East London	Annual General Meeting and Election of Officers.
25	Hackney	*Lenses.* J. A. Hodges.
25	Royal Photographic Society	*The Stereoscopic Photo-chromoscope.* F. E. Ives.—*Messrs. Newton's Simple Method of Projecting Stereoscopic Pictures.* T. E. Freshwater, F.R.M.S.—*Stellar Photographs taken without a Driving Clock.* J. Lunt, B.Sc., F.C.S.
26	Borough Polytechnic	*Photo-micrography.* D. Evens.
26	Croydon Camera Club	Twenty-fourth Public Lantern Show—*A Trip to Norway.* F. A. Bridge.
26	Leytonstone	Members' Lantern Evening.
26	Newton Heath	Annual Meeting.
26	Photographic Club	*A Trip through Brittany.* Henry Sturmey.
26	Putney	*A Visit to Spain.* E. D. Purcell.—Members' Slides.
27	Ashton-under-Lyne	*Colour Lantern-slide Making.* W. Chadwick and S. A. Platt.
27	Bradford	*Wensleydale and River Yore, from Mouth to Source.* F. Brundrett.
27	Ireland	*Pictorial Dublin (Old and New).* L. H. Strangways.
27	Leeds Camera Club	Exhibition of Members' Work and Smoking Concert.
27	Leigh	*Photography in Relation to Printing.* T. Peters.
27	Liverpool Amateur	Lantern Lecture. Charles Sharp, F.L.
27	London and Provincial	Lantern Evening.
27	Oldham	*A Holiday in Spain.* J. T. Lees.
27–29	Woolwich Photo. Society	The Society's Exhibition.
28	Birkenhead Photo. Asso.	*The I. O. M.* Mr. Whetton.
28	Croydon Microscopical	Demonstration of Presto Paper. A. Roods.
28, 29	West London	Annual Exhibition of Members' Work.

ROYAL PHOTOGRAPHIC SOCIETY.

FEBRUARY 18,—Photo-mechanical Meeting,—Mr. Chapman Jones, F.I.C., F.C.S., in the chair.

Mr. W. CHESHIRE read a paper on

HAND ENGRAVING OF HALF-TONE BLOCKS.

He said that the use of the screen in half-tone work had a tendency to flatten and deaden the copy made by its means, and consequently a large and increasing amount of attention had been given to the great improvement that could sometimes be made by the engraver, and few would be found to object to this use of the engraver's art if the result showed any real advantage, but in too many instances it was difficult to detect that any improvement had been made. On the other hand, it was easy to find examples of great improvement by the judicious use of the graver in the hands of careful, skilful, and artistic men who, by vigorous touching of the foreground and careful quieting of some noisy features in the background, had done much to brighten and heighten the value of the picture. It would be well, if time and price allowed, to submit an impression of the block to the artist who produced the original, but artists were often lamentably ignorant of the requirements and possibilities of process work. The engraver should possess a natural love of art, and, if he entered into the spirit of the original, the result would be satisfactory to all concerned, and a man who combined the feeling and taste of an artist with the technical knowledge and mechanical skill of the engraver should be fairly paid for his work. The tools required for engraving on half-tone blocks were much the same as those employed in wood-engraving, and, to enable the operator to see the picture and its requirements more distinctly, the ink roller should be passed carefully over the plate, and some finely powdered chalk rubbed into the interstices. The screen used in making a block upon which hand work was to be put should have from 150 to 200 lines to the inch, for the difficulties of the toucher were accentuated if a coarse screen was used. He expressed a hope that the half-tone process might speedily be placed on a sound business basis with respect to remuneration, and to secure this there should be the most complete harmony and singleness of aim on the part of operators, etchers, and engravers, each doing his part in order to produce the most artistic and satisfactory results in the work committed to their care.

Mr. T. BOLAS said that many people, himself included, were of opinion that the very best and most artistic photographic blocks were made before the screen came into use, and, as an instance, he called attention to some prints from Pretsch blocks which appeared in the Society's *Journal* for the year 1860.

Mr. CHESHIRE did not wish to condemn the use of a screen, but thought its effects were often far too prominent.

Mr. H. W. BENNETT pointed out that the character of the lining on a half-tone was very different to that on a wood block, and a wood-engraver had to learn something entirely new when he started to work on process blocks. Much quiet and unobtrusive work could be done with multiple tools making four or five lines at a time. It was very necessary that the engraver should possess a knowledge of drawing, in order that he might insert details which were either omitted or but faintly indicated in the block.

Mr. F. E. IVES was of opinion that great improvement was effected by judicious hand work, although he had previously been much prejudiced against it. He knew that the proprietors of a well-known magazine sometimes paid for hand engraving alone on a full-page block as much as 15*l*.

Mr. W. GAMBLE had found some advantage to arise by working with an ordinary engraver's ruling machine, and thought mechanical retouching was eminently suitable to a mechanical method, such as the half-tone process.

Mr. BOLAS thought that almost ideal results had been achieved by the screen process, but could not help an old affection for the Pretsch method; there was no doubt hand engraving was absolutely necessary to produce useful blocks for newspaper illustration.

After further discussion, Mr. B. J. EDWARDS exhibited a new

CAMERA FOR THREE-COLOUR WORK,

designed to take three negatives at the same time, with similar exposure, and with one lens. The light passing the lens was received on a translucent mirror, and reflected into a chamber immediately above the main body, where the negative for the red sensation was produced on a plate protected by a suitable colour screen; a portion of the light having passed through the first mirror was reflected by a second mirror to the top of the body of the camera, producing the negative for the green sensation; and, finally, the violet negative was formed in the usual position at the back of the camera. He found the Zeiss anastigmat lens was most suitable for obtaining sharp focus and identical size in all the negatives, and thought that with some little alteration it would be possible to take snap-shots out of doors, and portraits in the studio, for three-colour work. The colour screens were made of gelatine or collodion dyed with suitable colours.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 13,—Mr. Barker in the chair.

Messrs. E. T. Wright and G. E. Segall were proposed for membership.

Mr. T. E. Freshwater showed two more specimens of Mr. Swinton's work with the X rays, one of which was a plaice, and another a human foot, which latter had an exposure of only fifty-five seconds.

Mr. W. D. Welford showed a number of photographs of stranded whales on the New Zealand coast, and one of an ant held by finger and thumb holding a sixpenny piece, which he had calculated to be equal to a man holding ten tons.

The HON. SECRETARY, referring to the suggestion made last week that he had fogged or over-exposed certain test plates, described some experiments to prove the contrary.

ENLARGED NEGATIVES.

Mr. J. E. HODD proceeded to give his paper and demonstration on *Enlarged Negatives*. After pointing out the advisability of using a really serviceable camera for the production of the original negatives, and the evils attending the use of cheap and inferior patterns, he advised beginners in this branch not to stint their first outlay if they wish their enlarged negatives to be of any value. He proposed only to consider the making of enlarged negatives by artificial light, as being more convenient to use and leading to greater certainty of result, and described the necessary apparatus, in the present case consisting of a folding baseboard made in the form of a box to hold the entire apparatus when not in use, on the top of which were four guiding blocks to ensure the lens and light being being always at the same axis. The illumination used was obtained from a Silber paraffin burner, to which was fitted a metal hood with an oblong diaphragm parallel with the source of light, together with a crescent-shaped reflector, the idea being to cut off all extraneous light, while a certain increase of definition may be expected. A six-inch condenser was mounted on a block, keyed to the baseboard, and to the same block is also fitted a carrier for quarter-plate negatives capable of insertion either horizontally or vertically, while at the other end of the board a 10×8 camera, fitted with a rapid rectilinear lens of six-and-a-quarter-inches focus working aperture *f* 6, was fixed. Mr. Hodd then discussed the most suitable kind of negative, setting aside as useless any possessing hardness, granularity, and lacking shadow, detail, and half-tone. He preferred making a transparency by contact rather than by enlarging, and mentioned three methods—the carbon process, printing-out gelatino-chloride process, or an ordinary dry plate, the latter being the one he generally adopted. He mentioned that it was absolutely essential that the transparency should possess all the detail and half-tone in the original, and should be almost free from clear glass, transparent, and not too dense in the shadows. Some transparencies were passed round, the exposure with the majority varying from five to fifteen seconds at a distance of three feet from the lamp flame. With regard to the plate for this purpose, Messrs. Hodd had found that a good medium-speed plate answers all requirements, provided that a knowledge of its work under different conditions is possessed by the operator, and they thought that, by the use of a dry plate for the transparency, very great improvement in the result could be made. The formulæ adopted are as follows:—

Stock Solutions.

I.

Pyro	1 ounce.
Metabisulphite of potash	½ ounce.
Distilled water to	9 ounces, 1 drachm.

II.

Carbonate of potash	1 ounce.
Sodium sulphite	¾ ,,
Water to	10 ounces.

III.

Potassium bromide	1 ounce.
Water to	10 ounces.

It is recommended to take for transparencies: Pyro, 5 minims; alkali, 2 drachms; bromide, 5 minims; water to 10 ounces. For enlarged negatives: Pyro, 30 minims; alkali, 3 drachms; bromide, 10 minims; water to 1 ounce. By keeping as nearly as possible the transparencies to one standard density, it was found that an exposure of five seconds at *f*-22 was generally sufficient. Mr. Hodd also mentioned as an alternative process copying from a print direct, and some examples by this method were shown. It was recommended to give both transparency and enlarged negative full exposure, to prevent loss of half-tone, and to ensure against irregular lighting the smallest stop should be inserted when blue patches and yellow corners are plainly to be seen, but which are with a large stop not always visible. The composition of the fixing bath was as follows:—

Hypo	1 pound.
Water	40 ounces.
Metabisulphite of potash	½ ounce.

The CHAIRMAN asked whether Mr. Hodd preferred a contact or camera positive for enlarging.

Mr. HODD replied he had always used a contact transparency.

The CHAIRMAN asked why metabisulphite was added to the hypo?

Mr. HODD said it made the hypo acid and helped to clear the negative.

PHOTOGRAPHIC CLUB.

WEDNESDAY, February 12,—Mr. Haes in the chair.

On this evening the lower hall of Anderton's Hotel was used to accommodate the crowd of members and friends, the occasion being the Club's annual Ladies' Night. The entertainment, which consisted of an exhibition of lantern slides, examples of Professor Röntgen's cathodic silhouettes, and music, was under the competent direction of Mr. F. A. Bridge, and was carried through in his best style.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE Annual Exhibition of members' work was held in the rooms of the above Society on the 13th and 14th inst. The exhibits on the walls, although not as numerous as previous years, included some very fine work, chiefly brought about by the Exhibition being a competitive one. The following are the Judges' awards in the various classes:—

Class A (Landscape, 5×4 and over).—Mr. S. L. Coulthurst gained the award for *A December Sunset*, a simple but artistic study. Mr. O. H. Webb also

showed some excellent work, and Mr. T. Chilton also had a number of prints of good quality.

Class B (Landscape, 5×4 and under).—Mr. S. L. Coulthurst was also the winner in this class for a frame of four quarter-plate pictures.

Class C (Interiors).—Mr. J. Wood, with a set of Chatsworth pictures, was awarded the prize, the technique being very fine. Mr. J. Wolfendon also showing good work of Lincoln and Hereford Cathedral.

Class D (Instantaneous).—A series of snap-shots of street life by Mr. Coulthurst was first; and of a different character were a frame of five sunsets, which were of an artistic nature, the work of Mr. A. E. Casson.

Class E (Enlargements).—There was a good entry for this class, the prize going to Mr. F. Edwards for a 15×12 bromide from a quarter-plate of *A Street in Lisieux;* others of excellence were *Arthog Lake*, Mr. F. Andrews, and *Ludlow*, Mr. J. W. Young.

Class F (Lantern Slides).—This class brought a large number of entries, a set of six various slides by Mr. Harry Wade gaining the award; other slides, showing technical and artistic excellence, were sent in by Mr. H. M. Whitefield, Mr. S. L. Coulthurst, Mr. J. Wood, Mr. W. G. Coote, and Mr. H. V. Lawes.

Class G (Stereoscopic Slides).—Mr. J. Wood, for a set of six transparencies.

Class H (*Genre*).—No award.

Class I (Home Portraiture).—Mr. J. W. Young, for a good picture of *Laughing Eyes*, a brown toned study of a girl.

Apart from the competitions, there were a number of non-competitive photographs, amongst others being *Yacht Murre*, an enlargement from a quarter-plate snap-shot, by Mr. J. Brier. Enlargement of *Leukerbad*, Mr. J. G. Chapman; a 12×10 direct head; red carbon by Mr. H. Wade; and a number of half-plate instantaneous shots at Blackpool, by Mr. W. Tomlinson.

Lantern exhibitions were given each evening. On Thursday the 13th by Mr. Harry Wade, entitled *Glimpses and Glances*, and embracing views of the Isle of Man, Cork, and the Blackwater, English Lakes, and Shakespere's country. On Friday evening by Mr. S. L. Coulthurst, entitled *Street Life in Manchester*, the audience in imagination walking through the principal streets and into the lowest slums.

After each exhibition there were shown on the screen the slides sent in for competition, and also non-competitive slides sent in for selection by the members, including Messrs. J. Brier, E. Woodward, F. W. Andrews, J. Whittaker, and A. E. Casson. Messrs. W. Artinstall, J. W. Wade, and Geo. Wheeler were the Judges in the competitions.

Brixton and Clapham Camera Club.—February 11, Mr. J. W. Coade (President) in the chair.—Mr. R. G. F. KIDSON related his experiences of

THE TROUBLES OF A TOURIST.

Mr. Kidson gave an interesting and humorous narrative of the difficulties encountered on a tour with the camera, giving many useful hints as to carriage of luggage, changing plates, packing the exposed plates, &c. A general discussion, occupying one and a half hours, followed, many members speaking of incidents in tours which they had undertaken, and of failures through defects in the apparatus being found out too late, perhaps only on development of the plates exposed, and of other things connected with photographic touring. Mr. Kidson received the unanimous thanks of the meeting for bringing forward a subject of such practical importance, with the probable result of lessening the future troubles of tourists belonging to the Brixton and Clapham Camera Club.

Croydon Camera Club.—A very crowded gathering of members ensued on Wednesday, the 12th inst., no doubt greatly attracted by the opportunity afforded them of inspecting a splendid "one-man" collection, consisting of forty of the choicest medalled and other works of Mr. Ralph W. Robinson, of Redhill. The above comprehensive exposition of photographic possibilities as regards portraiture, *genre*, and landscape, formed a delightful series of object-lessons, which were studied and greatly admired by the critical audience. Hopes were freely expressed that so valuable and artistically praiseworthy a series might in the near future be displayed at some hall in Croydon, where the general public might be able to inspect them. The annual report, which the President read to the members, indicates that the Club is in a wonderfully flourishing condition. The meetings have been numerous and the attendances large. Twenty-two members were elected during the past year. The Club has been able to repay the President a loan made during the first year of its existence, and starts the new year entirely free of every penny of debt, and with 4*l.* cash balance remaining over from the last year's receipts. On the proposition of Mr. J. Smith, Mr. Hector Maclean, F.G.S., F.R.P.S., was for the seventh year in succession elected President. The following Vice-Presidents were appointed:—Mr. James Glaisher, F.R.S., the Mayor of Croydon (Alderman F. T. Edridge), and the Right Hon. G. T. Ritchie, M.P. There was a sharp competition for seats on the Council, the balloting resulting as follows:—Messrs. Burn, Hirst, Isaac, G. W. Jenkins, A. Jenkins, Noaks, J. Packham, Rogers, J. Smith, S. H. Wratten, Wreford, and Watson, who were declared elected. Mr. H. E. Holland was, amidst great applause, re-elected Hon. Secretary, Mr. Brown being appointed Hon. Assistant Secretary. The following candidates were elected members of the Club:—Messrs. Ibeson, P. Wratten, F. J. Elkin, and A. Underhill. A vote of thanks was accorded to Mr. Ralph W. Robinson for contributing the fine selection of his photographs already alluded to. The annual dinner was fixed for Wednesday, March 11, the following being appointed stewards:—Messrs. Frost, Waller, Wreford, and Hirst. Mr. J. T. Sandell presented the Club with an exceptionally fine pair of prints, measuring fifteen inches by twelve inches, taken in connexion with the Club excursion to visit the s.s. *Ormuz*. The President handed round several freshly made shadowgraphs, produced with the Röntgen rays by Mr. Swinton. Messrs. A. J. Noaks, Rogers, J. Noaks, A. Jenkins, and J. Smith exhibited a variety of flashlight pictures, which were of high technical quality, and some of which were of considerable artistic merit.

Hackney Photographic Society.—February 11, Mr. William Rawlings presiding.—Work was shown by Messrs. Roofe and Hensler. Mr. J. CARPENTER showed prints on

VENUS PAPER,

which were much admired. In reply to questions he gave the following information concerning the printing-out paper. It was a paper of recent introduction, and, to his mind, fully bore out the description given by the makers. It was issued in three grades—rough, medium, and smooth. He had tested all, and was much pleased with the results. For small pictures the medium paper was, perhaps, the best, as the surface was not too pronounced in roughness, the manipulation simple, and toning rapid, directions being as follows:—Print somewhat deeply and wash for a few minutes, place in a solution of salt (two and a half per cent.) for five minutes, afterwards well wash, and then place in toning bath. This might be any formula for gold toning, but the speaker had found the platinum bath as follows to give the finest brown tones:—Potass. chloroplatinite, 1 grain; chrome alum, 50 grains; salt, 10 grains; water (distilled), 10 ounces. When freshly made, this bath tones rapidly. The print should be removed when of a warm brown colour, and toning arrested by immersion in a ten per cent. salt bath. After well washing it should be fixed in a solution of hypo, one ounce to ten ounces of water, for twenty minutes, and afterwards washed for two hours in running water. Warm water might be used to quicken the washing.

Woodford Photographic Society.—February 6, Mr. E. B. Caird in the chair.—A few

PHOTO-MICROGRAPHS

were shown by the Secretary, and, as these were among the first taken by any member of the Society, they caused considerable interest. Mr. EXLER explained his method of working, which is simplicity itself. The microscope is so adjusted that the eyepiece end is inserted into the front of the camera. The lens having been removed, all extraneous light is carefully excluded. The object is then placed on the stage of the microscope, a two-inch condenser behind that, while a duplex oil lamp was used for illumination. The exposure varied with the objective used, and ranged between thirty and ninety seconds. Ilford isochromatic plates and pyro-soda developer were used. Mr. WARNERKE's paper on *Development of Printing-out Papers* was then read. The substance of the paper was that, after a short exposure to either daylight or artificial light, the paper can be developed and then toned, the results being equal, if not better, than direct printing and toning, formula and the whole method of treatment being very fully explained.

Woolwich Photographic Society.—February 14, Mr. W. H. Dawson presiding.—An interesting communication was made to the Society by four of its members, viz., Messrs. W. H. Dawson, J. B. Panting, J. Quick, and F. W. Machen, who stated that when the remarkable discoveries of Professor Röntgen were first made known they procured a Crookes' tube with a view of demonstrating these experiments in the so-called

NEW PHOTOGRAPHY

for themselves. They had been so far successful that they produced for the members' view some excellent prints from their first negative by this new process. They also explained that the powerful currents ordinarily used were not altogether necessary, as they had arrived at these results with ordinary science-class apparatus. They were able to prove that coal is transparent or nearly so, and glass quite opaque, the latter being a point upon which various opinions had been expressed in the daily press. These gentlemen intend continuing their experiments with the idea of showing the results at the forthcoming Exhibition on Thursday next, the 27th inst., and the two following days. They also intend to show the process in actual operation on those days, as they have no doubt it will be of great interest to the general public. Mr. H. J. DALBY, another member of the Society, then read a paper on *Toning and Finishing*, dealing with most of the printing processes. His paper raised many points for questions and discussion, which were kept up for a considerable time.

Birmingham Photographic Society.—February 11, Mr. G. F. Lyndon in the chair.—Dr. HALL EDWARDS, who has been so successful during the past week in obtaining

NEGATIVES BY RÖNTGEN'S METHOD

with X rays, gave many interesting results of recent experiments, and demonstrated his method of working before a large audience of members and friends. The lecturer said, owing to a number of circumstances, he had been lucky enough to obtain the first photograph in this city. For that achievement he had to thank to a great extent Mr. Boothroyd, who placed at his disposal one of the finest coils out of London, and Messrs. Philip Harris & Co. for the expedition with which they provided him with a Crookes' tube. The nature of the Röntgen's radiations having been explained by the aid of a partial vacuum tube.) Mr. Hall Edwards drew particular attention to Dr. Röntgen's accidental discovery that certain rays coming from the radiant matter would penetrate substances considered hitherto as opaque. In photographs which he (Mr. Hall Edwards) had taken the rays had not penetrated some of the metals, although they had others, but he believed with sufficient length of exposure they would be to take a photograph through an eighty-one ton gun. He expressed a hope that the rays would for the future be called Röntgen's radiations, rather than the "New Light," which was an absurdity, because they were not lights, being absolutely invisible to the eye. The exact method by which the rays penetrate various metals and opaque substances remained to be discovered, but they evidently found their way between the molecules and atoms and went completely through. Of course, some substances are more opaque to them than others, hence they were able to photograph the human hand; but, curiously enough, most of the substances which were perfectly transparent to ordinary rays of light were opaque to these rays. For instance, glass was opaque to an extent, and if it contained an amount of lead it was exceedingly opaque, and the same was the case with crystals, while the rays passed through an inch of aluminium with the greatest ease. Having technically explained the electrical apparatus used by him in the experiments,

the lecturer showed several interesting results by means of lantern slides. In one of these a coil of wire wound round the forefinger, was seen right through the bone. To ascertain the action of the rays upon bone, the lecturer first experimented with a piece of bone absolutely devoid of animal matter, and then with a piece of decalcified bone, the result going to prove that it is the chalky matters that caused obstruction. In his own mind he had no doubt that he could detect a needle in a hand in a very few minutes, and point out the exact position of it. As to the future of this photography it was impossible for him at this early date to say very much, but he thought it would be of very great practical use, and he trusted that he should again have an opportunity of coming before the Society and explaining his future researches more comprehensively.

Leeds Camera Club.—February 13.—Continuing his series of lectures on *The Chemistry of Photography*, Dr. Thresh explained fully the nature, preparation, and use of

PRINTING PAPERS

before this Club. After dealing in a most exhaustive manner with the theoretical side of the subject, the learned President gave his hearers a few useful working formulæ, amongst others may be mentioned the following:—*Plain or Matt-surface Paper:* Immerse in sizing and salting solution of arrowroot, ¼ ounce; water, 32 ounces; chloride of ammonium, 1½ drachm. Sensitise upon a 45 grain silver bath, acidified with citric or acetic acid. Another, in which gelatine is the sizing agent, is gelatine, 120 grains; water, 5 ounces; to which add 90 grains of chloride of ammonium. Float on silver bath, as in last formula. In preparing *Albumenised Paper* the white of one egg is required to 16 ounces of water, to which 160 grains of chloride of ammonium are added; but in this case a silver bath of 50 grains to the ounce is required, and must be alkaline, and not acid, as in the previous methods. In the preparation of fabrics for photographic printing a similar sensitising bath is used, but a substratum of gelatine, rendered insoluble with chrome alum, must be previously made and applied. The advantages derived, and the chemical changes that take place by "fuming" the paper before printing were also a subject that received considerable attention. The more recent processes of gelatino-chloride and collodio-chloride were most explicitly described, and the various methods of the development of the partially printed image were fully discussed, the lecturer recommending 4 grains of pyro, 3 grains of gallic acid, and 1 grain of citric acid as the best formula for most chemical papers. As regards toning, Dr. Thresh discounted the alleged "permanence" of the gold-substituted image, and strongly advocated sulphur toning alone. For this he claims absolute permanency, and declares that a print toned with sulphur can never fail, his practice being to fix thoroughly *first*, and tone afterwards. An animated discussion followed the conclusion of the lecturer's remarks, which, if correct, has sealed the doom of the utility of gold chloride in photography.

Newcastle-on-Tyne and Northern Counties' Photographic Association.—February 11, Mr. J. P. Gibson (President) in the chair.—Mr. J. E. Goold read an exhaustive paper on the collotype process, illustrated by exhibitions of plates, apparatus, and finished prints. Afterwards Mr. Goold showed numerous successful results of his experiments in photography by means of

THE RÖNTGEN OR X RAYS.

Working with a Wimshurst machine and a Crookes' tube of very small dimensions (one inch) had yielded results quite equal to most of the exhibited specimens; but his apparatus necessitated an exposure of thirty minutes. The most noteworthy specimen was a photograph of a plate of aluminium, which was enclosed in a cardboard box. The aluminium plate had on its surface printed matter in a coloured ink, evidently composed of a metallic salt, with the result that the printing, being of greater opacity to the X rays than the aluminium, was clearly shown in the photograph. Mr. Arthur Lander also showed several very good examples obtained by a tube of the same kind as that used by Mr. Goold, but working in a quite different direction. He used the 100-volt alternating current from the main, reduced to ten volts by a transformer, thence into an induction coil giving a 4-5 inch spark. One end of the secondary coil was then connected to one of the terminals of the Crookes' tube, and the other end connected to the inside of a Leyden jar, the inside of the jar being then connected by means of a spark gap to the other terminal of the Crookes' tube. Mr. Lander showed a photograph of a wire taken through prisms of wood, ebonite, and pitch, which resulted in an unbroken straight line, thus proving that the rays were not refracted, and that they were not Hertzian rays, as these latter are refracted by a pitch prism.

Oldham Photographic Society.—February 13.—Mr. N. Luboshez, of the Eastman Photographic Materials Company, London, attended a meeting of this Society at the Lyceum, when a very pleasant, interesting, and instructive time was spent. The meeting took the form of a *conversazione*, and Mr. Luboshez gave the members valuable information on many matters photographical. Enlarging, printing, and developing were all touched upon. Why failures frequently occur, and how success may be attained in the making of negatives, prints, and transparencies, were graphically explained and plainly demonstrated by Mr. Luboshez, who is evidently a great master of the art, and he fairly succeeded in gaining the attention of his audience, who showed their appreciation by asking a great number of questions and by passing a hearty vote of thanks at the close of the meeting to him for the advice and explanations he had given, and to the Eastman Company for their kindness in allowing their representative to spend an evening with the Society.

1896. FORTHCOMING EXHIBITIONS.

February 27-29 ..... Woolwich Photographic Society.
March 2-6 ..... *South London Photographic Society. Hon. Secretary, Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.
„ 3-6 ..... *Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

ORTHOCHROMATIC PHOTOGRAPHY WITH ORDINARY PLATES.

To the EDITORS.

GENTLEMEN,—I hope you will pardon me for bringing up, at this late date, the subject in dispute between Mr. Ives and myself, but I have been so pressed by my regular work that I was unable to make the experiments necessary to form the basis of a reply to Mr. Ives.

Mr. Ives stated that the Seed is not the only ordinary plate which has orthochromatic properties; and, as this is a matter in which he could not possibly be mistaken, I accept his statement.

Not content with knocking out what I intended to be the only point in my letter, he goes still further, and attacks *the dye* (?) I used, and in this attack he displays a spirit I least expected from one who has shown such an ability in scientific investigation as he has.

In the following I hope to prove that his attack (see his letter, page 813, December, 1895) was altogether unwarranted, and that, even if his conclusions should chance to be right, they are based on a knowledge of chemistry of whose soundness I will allow the reader to judge. Mr. Ives stated that he had made tests of the dye aurine, which Dr. Vogel and I had recommended, and then proceeds to dilate upon its worthlessness for screen purposes. To be brief, I never recommended the dye aurine, nor have I any knowledge of Dr. Vogel having recommended it. In *Die Photographie farbiger Gegenstände* (Dr. H. W. Vogel, Berlin, 1885), and in the *Taschenbuch der Photographie* (Dr. E. Vogel, Berlin, 1892), the dye "aurantia" is recommended, and *this* is the dye that I mentioned in my letter (page 735, November, 1895).

According to *Richter's Organic Chemistry*, translated by Smith, aurin (or yellow corallin, $C_{19}H_{14}O_3$) is the carbinol anhydride of trioxy-triphenyl methane, while aurantia is the ammonium salt of hexanitro-diphenyl-aurine ($C_{12}H_5N_7O_{12}$). Dr. Vogel, in *Practische Spectralanalyse* (Berlin, 1889), also says that aurantia has no characteristic spectrum reaction, but gives one for aurin. Well, so much for that; now for the results of the experiments.

The following experiments, of which I enclose proofs to the Editors were all made on Seed's ordinary 26 × plate.

First Formula.

Aurantia	·3	gramme.
Warm alcohol	25	c. c.
Collodion (two per cent.)	75	c. c.

Second Formula.

Chrysoidine	·5	gramme.
Alcohol	50	c. c.
Ether	50	c. c.
Pyroxiline	2	grammes.

Third Formula.

Naphthol yellow	·5	grammes.
Water	200	c. c.
Hard gelatine	10	grammes.

I tried one gramme of naphthol yellow to this amount of solution, but it crystallised out on drying. I coated thin mirror plate glass twice with the first formula, but only once with the others. The exposures were all made under a skylight, the subject being the colour plate which accompanies Vogel's *Handbuch der Photographie*, but were not all made on the same day. The stops used were *f*-25, *f*-8, *f*-12, according to judgment.

No. 1.	Without screen.		
„ 6.	Aurantia „	(single)	
„ 7.	Chrysoidine „	(„)	(very dark to focus).
„ 8.	Naphthol yellow „	(„)	(easy to focus).
„ 9.	„ „ „	(double)	screens face to face.
„ 11.	„ „ + chrysoidine	(hard to focus)	„ 7-8 „ „
„ 12.	„ „ + aurantia	(lighter than 11)	„ 6-8 „ „
„ 13.	Aurantia	(double)	two screens like 6.
„ 14.	Chrysoidine	(„)	„ „ 7.

The reader having a copy of Dr. Vogel's book containing this colour plate can follow my explanation best.

No. 1. Without a screen shows the yellows and greens too dark, while the ultramarine blue is nearly as light as the pink.

No. 6. Aurantia single shows the yellows lighter, and the blues darker, than in No. 1.

No. 7. Chrysoidine single shows no improvement over No. 1, and makes the pink lighter than the white paper on which it is pasted.

No. 8. Naphthol yellow single is a decided improvement, the yellows and greens being lighter, and the blues darker, than in No. 1, but the difference is not great enough to show the relative brightness.

No. 9. Naphthol yellow double is but a slight improvement on No. 8, showing that the naphthol yellow had about reached its maximum effect.

No. 11. Naphthol yellow plus chrysoidine. This combination yields, as stated by Mr. Ives, almost perfect results, the ultramarine and dark

green being perhaps a little too dark in comparison with the Prussian blue.

No. 12. Naphthol yellow plus aurantia gives fair results, but would have been better had the aurantia screen been darker, so as to have given the blues darker in comparison with the red.

No. 13. Aurantia *double*. This, to my "colour-blind eye," gives results differing in such a slight degree from No. 11 that it is hard to say which is the better, and it would have been still better had more of the dye been used. It was not near as dark as No. 11. When compared with aurantia *single*, goes to proves Mr. Ives's statement "that little may depend on the kind of dye used, and much on quantity."

Upon the results of this experiment I base the statement that aurantia is, when used at proper strength, a dye suitable for screens for orthochromatic photography. This, you will notice, is an issue which I had no idea of making when I wrote my first letter.

No. 14. Chrysoidine double. This screen was so dark that I focussed with difficulty, although I used the full opening of the lens and on a bright day. The results are worse than without a screen, but whether it is better than aurin, as Mr. Ives states in his reply to Dr. Eder, I am unable to say, as I have never used the latter dye.

In conclusion, Mr. Editor, I would say that, if you find from an inspection of the prints sent herewith that I am wrong in my judgment, you will kindly say so, as I have no desire to wrong Mr. Ives. I would also suggest that, should there be any further controversy, it be carried on in a more friendly spirit than in the past.

As for Mr. Burton's letter (page 15, January 3), if he has only flattery for Mr. Ives and mean insinuations against me to contribute, I would advise him to take Paul's advice to women in church.

Having accepted Mr. Ives's statement that he had used other makes of ordinary dry plates with orthochromatic results nearly equal to those which he obtained on Seed's, I cheerfully accord to him the honour of being the first, to my knowledge, to show the value of an ordinary plate for that purpose. The aurantia I used was purchased of A. Moll, Vienna, Austria.—I am, yours, &c.,

MILTON B. PUNNETT.

Jennings, Mo., U.S.A.

PHOTO-CHROMOSCOPES.

To the EDITORS.

GENTLEMEN,—In his letter in your last issue, Mr. Ives raises certain questions which, I think, call for some notice from me.

In the first place, Mr. Ives, although expressing his belief in the independence of my invention, remarks that his patent, *disclosing everything*, was published in America two months before I applied for provisional protection. As a matter of fact, until little more than a month ago I was perfectly ignorant of the existence of this patent; and, so far from disclosing any information to me, it could not have done so, since, *fully six months before I applied for provisional protection*, I had tried the methods specified in it, and found them unsuitable for my purpose.

In my last letter I asserted that the "step" idea was the first point I hit upon. This was in the beginning of 1894, and surely Mr. Ives does not claim to have published it then! In fact, I am of opinion that he would find it a most difficult task to prove the "step" arrangement to be his invention, or that of any single individual, or even that he was the first to disclose it.

As I stated in my last, coloured-glass reflectors may be good enough for a viewing instrument, but I repeat that, for a colour camera, they are well-nigh useless. Mr. Ives makes a great mistake in supposing that my silvered mirrors are so exceedingly delicate. So far from their being so, they may be cleaned and well rubbed with a soft cloth, and are as little liable to damage as coloured glasses. When I showed Mr. Ives my apparatus, I distinctly understood him to say that he had not tried silvered glass mirrors, as he did not think it possible to obtain the deposit sufficiently thin.

In his last paragraph Mr. Ives maintains that it is evident that my invention is constructed in accordance with his patent, for the purposes specified therein, and infringes his patent claims.

To all this I reply, that he must know such statements to be incorrect.

Instead of my instrument being constructed from his specification, it is decidedly superior to his for the purpose for which I designed it.

As for my purpose being the same as his, I need only repeat what I said in my last letter, that my aim has been to produce not only a viewing apparatus, but a camera in which the three negatives may be taken in the shortest time. The whole design of the instrument, and the difficulties I had to overcome, were connected solely with this aim, and let me assure Mr. Ives that, had I been content with the results I got from coloured glasses, my apparatus would have been patented *before* his photo-chromoscope.

Then, as to the infringement of his patent claims, I would ask Mr. Ives to read my claims when published before coming to such a conclusion, and, when he compares his patent with mine, he will probably find that not one of the claims I make is identical with his.

Finally, I may be pardoned in saying that the few results I have had time to obtain in my apparatus appear to me quite as good as any Mr. Ives has shown hitherto.

No one would gainsay the good and sound work Mr. Ives has accomplished in the three-colour process, nor the skill and ingenuity displayed in his contrivances; but surely he has exceeded the bounds of reason in taking up the attitude he does in the last paragraph of his letter.

No single individual is entitled to pose as the *fons et origo* of human intelligence, attacking a scientific problem such as three-colour photography, nor is any one justified in claiming the independent labours of others in solving such a problem.—I am, yours, &c.,

B. J. EDWARDS.

The Grove, Hackney.

To the EDITORS.

GENTLEMEN,—The more than vigorous attack upon me made by Mr. Ives compels me to ask you to publish this brief reply. On March 29, 1894 I took out a patent for a chromoscope. In the specification of this patent I claimed "to make this instrument by superposition of two platinised mirrors, one in front of the other." I did this, and on June 7, 1895, I took out an *additional certificate*, giving three different drawings, showing three ways of placing the platinised mirrors, one in front of the other, in accordance with my claim in March 1894.

Mr. Ives makes use of an analogous arrangement, but with coloured glasses. This arrangement has also been adopted by others in Germany, as well as by Mr. Edwards, as published in the last number of your JOURNAL. Mr. Ives therefore claims too much. Even the date of his patent proves that he had not the idea before me. Further, by what right does he forbid me the sale in France of an instrument which I have patented, and for which he has no warrant, by application for a patent? I reassert it; facts are stronger than words, however vigorous the latter may be. I have but to adhere strictly to my right, and to follow the road Mr. Ives points out, but with more serious intent, and forbid him the sale in France of a chromoscope, where mine has been duly patented at a sufficiently early date, and where he has not any patent. He has therefore no standing, either in fact or in law.—I am, yours, &c.,

C. NACHET, *Optician.*

11, *Rue de la Paix, Paris, February* 11, 1896.

"USE OF THE SWING BACK."

To the EDITORS.

GENTLEMEN,—I read the reply of the writer of this article, as inserted in your number of the 17th instant, and I am much obliged for the explanation.

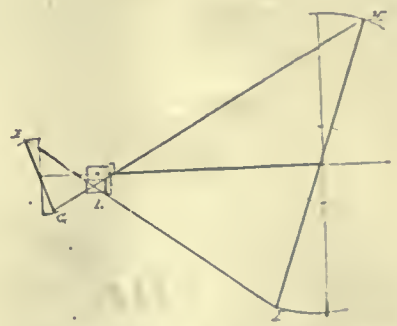
When it is said that the process of combined and adequate inclinations of negative and sensitive tissue for positive, as described in my article in the *Bulletin Belge*, does not present any novelty to ordinary photographers, I beg to differ, and so do the numerous Continental photographers that reproduced the process as a novelty.

I should feel obliged if your correspondent would kindly name *one* of the numerous photographic treatises, publications, periodicals, or papers read, that described this process previous to the date of my publication.

I wish also to state that this mode of redressing the lines can hardly be applied to enlargments on account of the want of sharpness. When enlarging, the whole of the field cannot be got into equal focus.

When negative and positive to be produced are of equal sizes and swing from the perpendicular a same number of degrees, the rays are of





equal length—A B is as long as C D. When a small negative is placed in a similar position to produce an enlargement, say, of four diameters, the rays or lines are unequally long—E F is much shorter than G H. The consequence is that the enlarged image is vastly out of focus.—I am, yours, &c.,

VICTOR SELS.

45, *Avenue Moretus, Anvers, January* 26, 1896.

COLOUR-RENDERING ON ORDINARY PLATES.

To the EDITORS.

GENTLEMEN,—May I, *pro tem.*, make reply to the letter of Mr. E. J. Wall, published in your last, respecting Mr. White's lecture at the Croydon Camera Club?

Mr. Wall's letter was only to hand at the Club on the 12th inst., and, Mr. White being absent for several weeks, it will, I fear, be yet some time before he could accept Mr. Wall's challenge to fight the matter out before some "independent and competent body." If by "independent" Mr. Wall means unbiassed, I fancy he will be unable to find such, for, unfortunately, in the upper circles of photographic societies there exists a most perverse objection to giving ear to the conclusions of practical workers.

Inasmuch as Mr. White has lately spent many months in copying coloured paintings, and has tested a variety of plates, screens, lights, &c., in order to get what he aimed at, I expect that he would carry small weight with any jury of theoretical experts, and none other seems likely to be available.

It has been one of the most notable curses of photographic advancement that for years the road has been barricaded by the *débris* of laboratory twaddle and the rubbish of text-books; for the foregoing, and other reasons, I should, if asked, advise Mr. White to leave the challenge severely alone, remaining content to let the photographic world take his conclusions and opinions as they stand for just what they are considered worth, remembering, however, that they are the outcome of personal experience, gained in reproducing several hundred works of art to the satisfaction of an employer who was keenly sensitive to the proper translation of colour values into the tones of monochrome.

Should Mr. White decide not to meet Mr. Wall in friendly contention, I will try and arrange for the publication, in one of the technical journals, of a paper, setting forth, with more precision and fulness than possible in a mere abstract, how Mr. White seeks to substantiate his case.—I am, yours, &c., HECTOR MACLEAN.

Croydon, February 14, 1896.

PHOTOGRAPHIC COPYRIGHT.

To the EDITORS.

GENTLEMEN,—Perhaps a few facts, or what we believe to be facts, concerning fees for the reproduction of photographs, might help to show that the minimum charge of the Photographic' Copyright Union is impracticable, at present at least.

Just the other day a representative of the *Border Magazine* called on us about photographs for reproduction, and our price for each view. He told us that Messrs. Wilson & Co. were charging 10*s.* 6*d.* for each photograph reproduced; but, as that price was too high, they were getting views from Messrs. Valentine & Son to reproduce for 5*s.* each. Our price being higher than Valentine's, he said it was no use looking at our work, and he didn't!

Now, as we do a good deal with London publishers, both in views and portrait studies, we have some experience of what we are writing about, and the rule may be laid down, that no hard-and-fast line can meet business requirements. The publisher knows, as well as the photographer, the value of most subjects submitted to him, and accordingly we find our prices vary on occasions, and properly too; no publisher needing such subjects will demur to a reasonable price.

It is different with popular views of places that sell generally, and Valentine's price for these, although a little lower than our own, is practicable. We could adduce many reasons for this statement. For instance, we supplied above a score of views to *St. Paul's Magazine*, London, at a price a little higher than that reputed to be Valentine's, and very soon after the arrangement had been completed another Edinburgh photographer offered his work at about half our prices. Of course we put little stress on this fact, knowing well that high-class publishers and block-makers have a keen eye on the work that suits their particular requirements. We may not refuse our sympathy to the weaker members of our craft when they endeavour to get a half-loaf rather than no bread; but it is not in human nature to quietly look on when one sees the so-called amateur lending himself to the "cheap-jack" publisher and printer, and this same amateur not seldom receiving his salary from the purses of the ratepayers. Many of these fellows have four and six weeks of summer holidays, besides every Saturday, or a large part of that day, in which they can devote themselves to photographing popular subjects, and suchlike. Not a few are excellently equipped in lenses, &c. and can really photograph well.

Now, the photographic profession cannot altogether ignore these photo-parasites. Their work has to be reckoned with now and then; and that, along with the other finger-posts we have pointed out by the way, demand more flexibility in Rule XXIII. of the Photographic' Copyright Union. We have no doubt, the rule has already done good, but we question if its retention longer be beneficial to any one.

Whether or not, photographers should all be sincerely thankful to the Copyright Union. Already its moral influence is great. Its very name is a terror to piratical printers and advertising schemers, ay, and some others we could name.—I am, yours, &c., JOHN PATRICK & SONS.

52, Comiston-road, Edinburgh.

A WARNING TO ASSISTANTS.

To the EDITORS.

GENTLEMEN,—The letters which have appeared in the JOURNAL from time to time exposing the sweating and bullying which is carried on by a firm with a large cheap trade were hailed with acclamation by the assistants employed by the firm. Although the name was not published, the firm was at once recognised, and many were the expressions of thanks to the JOURNAL for bringing the matter before the photographic world. Some little time since, through force of circumstances, I was employed by this cheap firm of photographers. After being bullied day by day for a few months, I at last could endure it no longer; so intolerable had it become that I resolved to give notice, which was received with a look of wonder by the head of the firm. After leaving, I made many applications for employment to London photographers, and in each case I was received with courtesy, but was informed they did not care to "employ any hands from a cheap house." I was completely annihilated with surprise. I walked home only to find that the country firms whose advertisements I had answered had not replied to my letters, so I presume they also have no wish to employ "hands from a cheap house."

This is a great injustice. I maintain that an assistant may in every way be qualified to turn out good work though he may have been employed for a few months by a cheap firm. It is, indeed, very hard to be boycotted for the simple reason that assistants have, through circumstances over which they have no control, served with a third-rate firm.

I can now see the force of the remarks made by the head of the cheap firm, *i.e.*, that his operators and assistants always stop with him for years." Yes, for they find a great difficulty in obtaining another engagement after being in his employment. Other firms, during my walk in search for employment, remarked, "Your late firm wish to have the monopoly." There is some truth in this; they have now several branches in London, to which I have no doubt they will add. This well-known fact may aptly serve to exemplify the high pressure at which competition, in respect to the cheap work, has been carried on of late years by this firm. I have seen assistants bullied before sitters for taking 10*l.* on a Monday and not "keeping it up" throughout the week. It matters not how dense the fog, or how wet or dull the day, those in charge of studios are expected, under threat of dismissal, to do a "good business," and at the present time, with the trade in such a depressed condition, the assistant must come in for any amount of bullying. This system of bullying is carried on by the heads of the firm, and is eminently calculated to make the most cheerful assistant's life a burden to him. There can be no wonder that the assistants are not treated as human beings, but as machines for turning over money. There can be no possible excuse for this absolute want of justice and humanity.

This letter would be incomplete without I mention the principal grievances. They are as follows:—Bad pay, long hours, stoppage of pay for illness, no holidays in place of Good Friday and the four Bank Holidays, Friday's developing to be done on Saturday (which would enable all hands to leave at five p.m. on Friday); last, but not least, the bullying, which is carried on at all the studios. In fact, gentlemen, the assistants are treated as mere serfs, who have no rights. At the works of this firm great discontent prevails with regard to the treatment of the printer and toner, &c., who have a formidable array of grievances; would space permit, I could fill pages of the petty tyranny of this firm.

In conclusion, I should add that at the time of my leaving there was some talk of a meeting of the assistants after business hours to consider what course to take with regard to their treatment. Whether the meeting was held, I am unable to say; but, if not, it will only be a matter of time, for the hour will come when all the grievances will be perfected, but will never be if the assistants sit down and content themselves with writing grumbling letters, instead of actively engaging in rectifying all defects which abound in this firm. It is pitiful that a large firm, instead of conciliating their workpeople and treating them, as they can well afford to do, should treat them like hucksters. Still the assistants find some comfort in the thought that they can rely upon the courtesy and kindness of the Editor of the JOURNAL to assist them in the redressing of their proved grievances. But I hope that the heads of this firm will have learnt enough from the recent letters, published in the JOURNAL, to perceive that the true interests of their pockets lie in the better treatment of their assistants. Apologising for the length of this letter, I remain, yours, &c., A VICTIM.

London, February 15, 1896.

THE BEAUFORT LIGHT.

To the EDITORS.

GENTLEMEN,—The light used for the gaslight demonstrations taken notice of in your issue of the 14th inst. was the Beaufort gaslight for portraiture.

As the name was omitted from your notice, oblige by publishing this.—I am, yours, &c.,

W. A. Vérel, jun. (Albion Albumenising Company).

96, *Bath-street, Glasgow, February* 17, 1896.

PHOTOGRAPHY AT THE ROYAL INSTITUTION.

To the Editors.

Gentlemen,—About the 3rd of January last I received, whilst at Montreux, Switzerland, the following note:—

"*Albemarle-street, January* 1, 1896.

"Dear Sir,—I should be very glad if you would show your panoramic camera again at the Royal Institution *conversazione*, on January 31, also your fine collection of photographs taken during the past three years.—Truly yours, Herbert Fyfe, *Royal Institution*."

To this I replied that the photographs were at the Polytechnic Institution, Regent-street, and that I would be very pleased if they could arrange for their exhibition; as regards the instrument, that a new one was being made for me in Geneva, and that, if ready in time, I would show it. To this letter I had no reply. So, on January 25, I wrote, saying that the instrument was completed, and, if the Royal Institution proposed to exhibit my photographs, I would attend personally and show the instrument; in conclusion, I added: "Wire reply, 'Yes,' or 'No.' To this I had a wire, "Yes." Accordingly, I left Montreux on January 28, arriving in London on January 29. I again wrote to Mr. Fyfe, asking at what hour I should attend with instrument, and had for reply, 7.45 p.m. at latest. At that hour I presented myself at Albemarle-street, and asked for Mr. Fyfe. I was told he had not come. I asked another gentlemna, who was acting for Mr. Fyfe, where the instrument should be set up. He indicated a corner. I then looked round the room, and, seeing none of the photographs, asked where they were. This gentleman showed surprise at being asked such a question, and asked what photographs I referred to, and where they were. I told him I had travelled from Montreux at the request of the Royal Institution some seven hundred miles, and that some one had grossly blundered in not obtaining the photographs as arranged. He sent off to the Polytechnic Institute, and about 8.30 a portfolio containing a few prints (not those referred to in Mr. Fyfe's note) was obtained. There was no suitable place to arrange them, so the majority were left in the portfolio. I was offered no opportunity whatever of explaining or describing the instrument, and at 11 p.m I left. Thus, I travelled some seven hundred miles at the request of the Royal Institution at a cost of 5*l.* for railway expenses alone, for the privilege of putting up and taking down an instrument. I was not spoken to during the entire evening by any one on behalf of the Royal Institution. I leave your readers to form their own opinion on the matter, and, if, as I think very possible, others have received similar treatment to myself, I hope they will come forward and say so, so that, if possible, public opinion may be brought to bear upon what looks very much as if the Royal Institution catered for their own members at the expense of outsiders.—I am, yours, &c.,

February 11, 1896. R. W. Stewart, *Colonel* (late) R.E.

RE THE RECENT LIMELIGHT COMPETITION.

To the Editors.

Gentlemen,—In reply to Mr. Scarborough's letter, permit me to say that if any observations contained in my letter can be considered as reflecting upon the conduct or honour of Mr. Scarborough or any of the gentlemen present, they were not so intended by me, and I can only beg of them to accept my most sincere apology, and to believe me when I say that I shall be extremely pleased if the same gentlemen can be prevailed upon to officiate again, and I should be certainly wanting in justice too, if I did not also say that I consider Mr. Scarborough's conduct throughout the contest was marked by a spirit of the utmost fairness, although there are points in his letter upon which I suppose we must agree to differ; but I must take this opportunity of correcting Mr. Scarborough's figures, viz.—·072 against ·085—upon the difference of bore of the nipples the proportion of which is, I believe, ·18 or between a fifth and a sixth, not nearly a third, as stated by him.

I am quite agreeable to accept Mr. Scarborough's challenge, although it will entail considerable inconvenience upon me, having over 120 miles to travel; but, as the challenged party, I think the right to name the conditions of the contest rests with me, and these are:—

1. That the contest be public as heretofore, in the lanterns.
2. That Mr. Scarborough and myself each work his respective jet.
3. That I have the liberty to use a mixing chamber of as large a diameter as Mr. Scarborough, and not, as previously, to be handicapped by fighting with a mixing chamber only ⅝ in diameter against one three or four times that size.
4. That in the event of a dead heat the jet consuming the least gas be declared the winner.
5. That neither of the competing jets be so large as to be unavailable for use in lanterns of maximum commercial size without alteration.
6. The loser to bear the out-of-pocket expenses of the competition.

Lastly, to make the contest, if possible, satisfactory to all parties as a final solution of the jet question, and to give Mr. Scarborough an opportunity of doing his utmost in this direction, I mention the fact that I have since the contest constructed a jet of rather more than double the illuminating power of the one I used on January 22, the full particulars of the trial of which I think he will find in the report of the meeting of the Bristol and West of England Amateur Photographic Society, which should appear in the next issue of The British Journal of Photography.

Any minor details I shall be happy to arrange with Mr. Scarborough privately.—I am, yours, &c., G. W. Gwyer.

Bourneville, Sneyd Park, Bristol, February, 17, 1896.

FILING OF TRADE CATALOGUES AT THE PATENT OFFICE.

To the Editors.

Gentlemen,—A few months ago some correspondence appeared in the electrical trade papers on this subject, and the attention of this Chamber was recently called to the matter. The following letter to the Patent Office and the reply thereto may be of interest to your readers, and the publicity given to the same through your paper may be the means of rendering the collection of trade catalogues at the Patent Office still more complete.—I am, yours, &c., Kenric B. Murray, *Secretary*.

Botolph House, Eastcheap, London, E.C.

[Copy.]

Sir Henry Reader Lack, *Comptroller General, Patents, Designs, and Trade Marks Office*, 25, *Southampton-buildings, Chancery-lane, W.C.*

Sir,—The attention of this Chamber has been called to the fact that the Librarian of the Patent Office of the United States of America is making a collection of illustrated and other trade catalogues, price-lists, circulars, and other similar publications, for reference by those instituting inquiries in regard to patents, designs and trade marks, or making use of the Patent Office Library.

I am desired to say that in the opinion of this Chamber such a collection of records in your department would be exceedingly valuable, and am directed to bring the suggestion before the authorities of H. M. Patent Office as one which it would be well to adopt.

By this means there would be permanently preserved an enormous amount of extremely useful material which might on occasion elucidate the meaning of many trade terms and usages.

If such a collection and filing were adopted by the Patent Office, it would, no doubt, be extremely serviceable, and be largely resorted to by those interested in patents, designs, and trade marks.

I am desired to express the hope that this suggestion will receive the careful consideration of the authorities of H. M. Patent Office, and I shall be glad to learn their decision in the matter.—I am, Sir, yours faithfully,

January 27, 1896. (Signed) Kenric B. Murray, *Secretary*.

[Copy.]

The Secretary, *The London Chamber of Commerce, Botolph House, Eastcheap, E.C.*

Sir,—I beg to acknowledge the receipt of your letter of the 27th inst., suggesting, on behalf of the London Chamber of Commerce, that a collection of illustrated and other trade catalogues, price-lists and similar publications should be made and filed in the Patent Office Library, and in reply to inform you that the nucleus of such a collection was formed some twenty years ago, and has since that date been gradually extended.

In view, however, of the suggestion of the London Chamber of Commerce, I shall be happy to consider how far it may be possible to render this collection more complete and to make it more easily accessible for public reference.—I am, Sir, your obedient Servant, (Signed) H. Reader Lack,

25, *Southampton-buildings, Chancery-lane, London, W.C. January*, 23, 1896. *Comptroller-General.*

RUSSIAN PHOTOGRAPHIC PAPERS.

To the Editors.

Gentlemen,—In The British Journal of Photography, for February 14, I notice a statement that a photographic journal has been started in Russia. It may interest your readers to know that there exists a monthly journal, *Photographe Loubietel*, published at St. Petersburg, and edited by Captain Lavroff, which is now in its seventh year at least. Until quite recently it possessed a rival in the *Photographicheski Westnik*, also of St. Petersburg, which was founded in 1888.

Most of the back volumes, as well as current issues of these periodicals, are to be consulted in the Royal Photographic Society's library, by those who, like yourselves, appear to be familiar with the language.

The journal of the Imperial Russian Polytechnic Society also devotes much of its space to photographic matters.—I am, yours, &c.,

R. Child Bayley.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED :—

A. H. De' Ath, Bank-street, Ashford, Kent.—*Three photographs of Alfred Austin, Poet Laureate.*

CONSTANT READER.—W. L. NASH. Probably in our next.

FACTORY ACT.—A BRIGHTONIAN. You omitted your name and address.

COL. J. E. GUBBINS.—Thanks for suggestion. It will probably be acted on.

LENS FOR ENLARGING.—BEGINNER writes: "Can I use the lens with which the original negative was taken for enlarging, or is a special lens required?"—In reply: The first lens will answer all purposes.

RATIO OF STOPS.—D. ANDERSON writes: "Can you let me know through your Inquiry column how the size of a stop or diaphragm is ascertained for a lens of a given focus?"—Simply divide the focus of the lens by the size of the stops.

DEXTRINE FOR MOUNTING.—TOUCHSTONE. Although this would be a convenient mountant, it should not be used for silver prints. The dextrine met with in the shops is almost always acid, sometimes strongly so, which would act injuriously on the photographs.

CHIPPED LENS.—R. RODGER. The two chips caused by the accident will not injure the working of the lens if the places be blackened over with a little black varnish to prevent reflections. There will be a slight loss of light, but so trifling that it will not be noticed in working.

COPYRIGHT CHARGES.—J. E. HUNT says: "Recently I have heard from a publisher, *re* one of my copyright photographs. He asks if he might use it for publication. The photograph is of a very popular minister. What fee should I ask?"—Possibly a fee of 1*l.* 1*s.* would meet the case.

VARNISH.—TACKY. If the varnish is of the brand mentioned, we feel assured that the fault does not lay with that. The only way we can account for the non-drying is that the hyposulphite of soda was not all washed out of the film. Hypo left in the film will often prevent the varnish from drying hard.

SUBSTRATUM FOR LANTERN PLATES.—R. E. C. asks how the substratum is made that is used in making lantern slides by the wet-collodion process?—Put the white of an egg in a Winchester quart bottle, add a quart of water and a few drops of ammonia, and shake it up vigorously for a few minutes, then filter through paper for use.

FIXING BATH.—H. H. EALY wishes to know the proper strength of a fixing bath for bromide papers, and the time for which the prints should be immersed, opinions seeming to be widely different on the point.—In reply: The best strength is four ounces of hypo to the pint of water. If there is plenty of solution, and it is fresh, *i.e.*, has not been used before, the prints will be thoroughly fixed in fifteen minutes, and there will be no gain in leaving them in any longer.

ENCAUSTIC PASTE.—J. BATEY. The formula for this, as given in the ALMANAC, is quite correct. There may be two causes for your want of success: First, the use of impure wax; secondly, faulty application. Rub a little of the paste over the print with a piece of soft flannel, and then polish off with a second piece. A thin coating only is required. The same flannel can be used over and over again. Indeed it improves by use until it becomes saturated with the paste.

NIGHT PHOTOGRAPHY.—W. PINDER says: "I have got an order to take an instantaneous photograph of a large group at night at eight p.m., out of doors, in the main street. Kindly let me know if it is possible. If so, I should like to know the best way to illuminate the group. We have no electric light here."—It can be done, of course, with a strong light. Magnesium flashlights are the only things that can be used if the work must be instantaneous. Several lights should be used, and placed so that they evenly illuminate the group, and be fired simultsneously.

SECONDARY IMAGE.—PETTINGELL inquires: "How do you account for the enclosed, I mean the seeming shadow of the house inside the other? We are quite sure there were no double exposures, or any way in which the light could get in. These prints are off two different plates taken after each other (at the same time) on a rather dull and windy morning. Taken with a 12×10 camera and lens."—The second image is caused by a minute hole in some part of the camera, probably in the front, near the flange of the lens. This has acted the part of a "pin-hole" camera and produced another image.

CRACKS ON ALBUMEN PRINTS.—E. BLISS. With highly albumenised paper cracking of the albumen is no uncommon thing if the prints are allowed to curl up as they dry, then they crack when they are uncurled. The trouble may be avoided by mounting the prints while they are still wet, or drying them between blotting-paper, so that they are kept flat the while.

EXPANDED FILM.—MAC says: "I took a negative of a ball-room on Saturday which cannot he done agsin. When I took it out of the fixing bath, it had nearly all left the glass, so I removed all the film, with the intention of putting it on a larger glass, but I find that the part of film that left the glass in fixing bath has expanded. Is there any way of contracting it again?"—If the film had been put into spirit at the time, it would have gone back to its original size. If it is still wet, it will probably do the same now. If it has been allowed to dry, the case is doubtful. The best thing we can suggest is to soak the film for some hours in water, and then to put it into spirit.

CONDENSER.—ENLARGER writes: "As we wish to be independent of daylight for enlarging, we should like your opinion as to the best way to get, say, whole-plate negatives enlarged, evenly illuminated, and the exposure not too slow. Condensers are said not to give satisfactory results, and without them very likely the exposure would be too slow. An answer will oblige."—The best way will be to use condensers. They do give satisfactory results, and are generally employed where artificial light is used. Of course, the light must be in the proper position, and the condenser of sufficient size to evenly illuminate the negative. This, for the size named, must not be less than eleven inches in diameter.

STAMP PHOTOGRAPHS.—F. H. INQUIRY asks: "1. Where can I purchase a camera with twenty-five lenses for postage-stamp photographs? I want to take twenty-five on a cabinet plate, five in a row. 2. Where can I purchase a perforating machine for dividing the aforesaid postage-stamp photographs? 3. What is the method of gumming the backs—if any special—and where to purchase the gum best for the purpose? 4. How to produce those beautiful rich brown tones on P.O.P.—not chocolate—I have seen produced by several first-class photographers? I use the sulphocyanide toning bath, and get good tones, but they are too much like the ordinary silver print tone, and certainly do not approach in any way the tones I speak of."—1 and 2. Any of the large dealers will supply the necessary apparatus. 3. Gum arabic, with a trace of glycerine, brushed on the back. 4. Almost any tone may be obtained with the sulphocyanide bath from suitable negatives.

A LENS FOR GROUPS.—BETA writes: "Can I use one combination of my portrait lens as a single lens to take a group by? What stop should I have to employ to get good definition? Would the exposure required be longer than that when using the entire lens?"—In reply: The front combination will most likely be found to be satisfactory, but it should be turned round, so that its convex surface is towards the ground glass. It will certainly have to be stopped down to *f*-11 or more to get the best definition; but, if very sharp outlines are not required, it might be found to work well at *f*-8. The exposure will certainly be longer than is the case when the entire lens is employed. It is sufficiently accurate to expose in proportion to the stop employed, in the usual way, giving, with *f*-11, an exposure about eight times that which would be given were the portrait lens, with open aperture, in use. Theoretically, a little less exposure would suffice with the single lens, since this has fewer reflecting surfaces to diminish the light, but in practice this difference is too slight to need to be taken into consideration.

A MEAN TRICK.—S. W. writes as follows: "Our vicar came to me three or four weeks ago to have his portrait taken to sell at a bazaar. He said he would require a large number of copies, but he would pay for the sitting and order the number of copies required afterwards. I took three negatives, though I only charged him for one, and sent him a proof from each. As no order followed, I wrote him, and had a reply, saying the portraits were very good, but he would not require any more. I found, when the bazaar was on, that he had sent the proofs to a London house that advertises cheap copying, and had several dozens made, which were sold at eighteenpence each. Though they were wretched things, they were said to have been taken by me, and they will do me an injury. Have I any remedy under the Copyright Act?"—No; we fear not. You might, however, advertise in the local press that the prints sold at the bazaar were not your productions as alleged. By that means you will set yourself right with the public, and, at the same time, expose the mean trick.

TONING BATH.—PSEUDONYM says: "Regarding the combined bath for gelatino-chloride prints, I have used Solio and Criterion paper for more than three years, and, on the whole, got on well; but sometimes it happens that it is impossible to get anything but foxy tones, no matter how much gold is used. Can you suggest a reason why it is? The Eastman Company, in their instructions, tell one to put a piece of litmus paper in the bath before toning, so that only uniform acidity should be maintained; but they don't say what to use to make the bath more alkaline or acid, as the circumstances may require. Can you inform me as to this? Why is it necessary to use a lead salt with the gold, lead salts being always regarded with suspicion in a toning bath? Lastly, can you tell me what purpose each of the ingredients is used for, except the hypo?"—The reason good tones are not obtained is that the bath is out of order. Too great an acidity of the bath may be corrected by a little chalk. Why the lead salt is used is because the combined bath does not work well without it or the other ingredients. The combined bath is not to be recommended on account of its uncertain action and results. Why not use the sulphocyanide bath? It is in every way preferable to the combined bath.

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EX CATHEDRÂ.

Mrs. L. R. Stuart-Wortley, of 55A, Gloucester-place, Portman-square, W., writes to us: "I am the widow of the late Colonel Stuart-Wortley, who was famous for his sea and sky studies and life studies. I am now carrying on photographic work in memory of him, and have all the original photographs he took, which I have made copyright, and am exhibiting them in my little studio. It has been suggested to me that these studies should be seen by artists and students of nature, to whom they would be most valuable and helpful, and, no doubt, there are many young men who have never seen any of these photographs."

* * *

We are happy to give publicity to Mrs. Stuart-Wortley's communication. The photographs are on view at her studio, at the address given, on Mondays, Wednesdays, and Thursdays, between two and seven.

* * *

The most recent One-Man-Show at the Camera Club included a number of works by Mr. Henry Stevens. The photographic art of Mr. Stevens is many-sided. At one time it seemed as if he was inclined to devote himself exclusively to the representation of flowers by means of photography—a branch of work in which he was signally successful. Then his fox-terriers, next his cats, and finally both, characteristically grouped, occupied his attention. Of these varieties of work, and the opportunities they present for photographic treatment, Mr. Stevens showed many examples and illustrations in the display which was on view last week. Snow scenes and portraiture have also come within the scope of his powers, and the total result was a collection of signally good and faithful photographs. If we may presume to hazard a general opinion with regard to Mr. Stevens's work, we would say that, in the field of animal portraiture, he has not yet fully developed his own capabilities or exhausted the opportunities it offers.

* * *

Mr. F. F. T. Weeks, a clever artist, of 263 Cann Hall-road, Leytonstone, whose lantern-slide reproductions of life studies we have already had occasion to favourably notice, is making a speciality of touching up photographs which have to undergo the ordeal of phototypic reproduction. The special features of Mr. Week's work are thus summarised by himself:—"Halation and movements rectified, detail strengthened, and all faults and imperfections accurately made good and improved. Figures, backgrounds, skies, and scenic surroundings added, obliterated, or altered, as desired. Enlargements produced and improved for process from any basis. 'Mosaics' and 'composites' artistically and pictorially made up with or without fancy and appropriate borderings, lettering, &c. Old engravings, &c., bleached, improved, and worked up. Old portraits, photographs, &c., reproduced equal to new." In giving Mr. Weeks the benefit of this publicity we are animated by the wish to see others of our readers profit by his example. Assuredly the "working up" of photographs for reproduction is a branch of the art that admits of remunerative cultivation.

* * *

At Marlborough Hall, Regent-street, kinematographic or kinetoscopic pictures on the screen are being shown by means of the contrivance "invented" for that purpose by Messrs. A. and L. Lumière. Setting aside some minor imperfections of vibratoriness and "light streaks" rapidly flashing across the pictures, the representation of lifelike movement on the screen was very successful on the occasion of our visit last week. We described and illustrated the kinematograph at p. 11 of the Lantern Record (Supplement to this Journal) for February

7 last. In their official circular relating to these projected photographs of animated scenes Messrs. Lumière say: "The photographs, taken on a continuous band at the rate of 900 per minute, are by means of the electric light projected life size upon a large screen at exactly the same rate of movement, so that a changing picture is produced perfect in its fidelity and naturalness. It thus becomes possible to reproduce scenes and events of historic importance, of political, social, or sporting interest, with such perfect accuracy of detail, change, and movement, that a roomful of people in London may enjoy the perfect illusion of being actual witnesses of the spectacle." There is a mechanical rhythm and jerkiness in the movements of the figures as shown on the screen which possibly combats the theory that the projection of the pictures is effected at the same rate of movement by which they were taken. For all that, the system is wonderfully interesting and effective, and, for a time at any rate, kinetoscopic pictures on the screen will assuredly be popular.

IODINE AS AN ELIMINATOR.

When it is necessary to intensify a negative after fixing with hypo, it is a common practice to resort to the employment of what has been called an eliminator, to remove the last traces of that agent and its compounds, though it has frequently been pointed out in these pages how wrong the practice is in principle. Of the various agents so employed, tincture of iodine amongst others has been recommended, but it is probably one of the very worst that could be so employed, and, in many cases, does far more harm than good, since it only transforms any hypo that may be present into sodium tetrathionate, which is, at least, as dangerous. But iodine is frequently employed before intensification, not as a hypo eliminator, but to convert a small surface portion of the image into iodide of silver, and so facilitate the subsequent deposition of silver.

This application of iodine is really useful, and in every way legitimate, but, in adopting it, what we have said above should be borne in mind. Now, many operators, both with gelatine and collodion plates—we speak more especially of emulsion films—employ tincture of iodine in this manner, trusting to it to do duty as a hypo eliminator as well; and here danger comes in. If there be any considerable quantity of hypo present—and this means that there must of necessity be also some silver remaining in the form of the double hyposulphite—the iodine will convert the silver into iodide, and render it necessary to refix the plate, and, of course, the trouble of washing again is incurred. If the quantity of soluble matter remaining be very small, there may be no visible precipitation of iodide of silver to warn the operator of danger; but, upon proceeding to intensify, it is almost certain to make its presence palpable by a strong discolouration in the shadows.

Whenever it is necessary to adopt the iodine treatment previous to intensification, unless the fixing has been already performed with cyanide of potassium, a solution of that salt should be flowed over the plate previous to the application of the iodine; or, better still, if the image will bear a little reduction, flood the film with iodine before the cyanide. The iodine will convert any hyposulphite of silver into iodide, which the cyanide will remove, as well as any slight veil that may be present, and a moderate washing will remove the final traces of silver. Then the surface may be iodised to any extent, and intensification proceeded with in safety.

It is worth while to bear in mind that, of the three fixing agents that have been mentioned, cyanide acts most freely upon iodide of silver, and upon bromide and chloride in the order named. Hypo dissolves silver chloride most readily, bromide next, while its action upon the iodide is very feeble.

THE CARRIAGE OF GAS CYLINDERS.

We are still without the report of the experts appointed by the Home Office to inquire into the charging, transmission, &c., of gas cylinders, although we are fast approaching the end of the lantern season, and the railway companies still place vexatious restrictions on the conveyance of the cylinders. Whatever may be the report of the Committee, it by no means follows that it will influence the railway authorities as to their regulations and prohibitions. We have a pretty shrewd idea that, notwithstanding these, charged cylinders are often carried, surreptitiously, as personal luggage.

Only a week or two back we alighted at a suburban station of a railway that refuses the conveyance of gas cylinders on any terms. Out of the same train got, apparently a young curate, with a considerable amount of impedimenta—more than he could conveniently carry. It consisted of a large square black box, on the top of which were strapped three long deal boxes, about four inches square. He had also a stout leather bag. The box package seemed to cause no inconvenience to this muscular young Christian, but the bag did. Evidently by its weight it contained something heavier than a cassock or surplice.

At the exit of the station the services of an outside porter were invoked, who took the bag, but soon found it necessary to hoist it on his shoulder for convenience of carrying. One could not help speculating on what the packages contained. We had no doubt whatever but that the smaller long deal boxes contained lantern slides, and as little doubt that the square box held a lantern. But the leather bag? Except for the fact that all the stations on that line were placarded with bills, stating that cylinders of compressed gas would not be carried as personal luggage, or admitted in the company's stations for any purpose whatever, and the fact that the gentleman was in clerical garb, we should have had no hesitation in saying that the strong leather bag contained a couple of ten-feet cylinders of oxygen and hydrogen gas. Later on, we heard there was to be a lantern show with the limelight, by a reverend gentleman, to the children of a Sunday school in the neighbourhood.

Photographs of a "Flying Man."—Some of the most interesting of recent photographs are those of Herr Lilienthal, whom photographs of undoubted *bona fides* clearly represent suspended in the air with his wings expanded. They show incontestably that he is in the air, and suspended many feet high by his curious apparatus, the whole suggesting a huge bat with an extra pair of wings some distance above and parallel to the main pair.

Liebig's Condenser.—The true name for this time-honoured piece of apparatus is at present the subject of a mild polemic. In a foreign contemporary Dr. G. W. H. Kaulbaun has a note on its origin. It appears that Liebig himself always wrote of it as Göttling's; but neither did the latter lay claim to its invention, for he clearly attributes it to C. E. Weigel, Professor of Chemistry and Botany at Greifswald. The first description with diagram of this indispensable adjunct to the laboratory was published thirty years before Liebig was born.

Marey's Chrono-photographs.—Those who are interested in the photographing of a series of views of various animals executed with phenomenal rapidity will find much to interest and instruct in a new work on the subject, which this philosopher has recently published. His plan of working is different from that of many others. In some cases a large number of photographs are taken on one plate, the exposures varying from one-five-hundredth to one-tenth of a second, fogging being obviated by placing a background of unilluminated black velvet behind the subject, which receives full sunlight.

A Novel Use for the Röntgen Rays.—According to a Vienna correspondent (but it is not necessary to believe everything written about the latest popular science) an application of a very practical nature has been made with the new form of energy. In the Museum of Natural History in that city is stored an Egyptian mummy, which is esteemed as very valuable. In appearance it is like the mummy of a human being, but certain inscriptions upon it suggest that a bird—an ibis—lay beneath the wrappings. It is too rare and valuable a specimen to be subjected to possible injury by unwrapping it, so it was determined to Röntgenate it. It was taken to the School of Photography and operated upon accordingly. The sciograph obtained showed clearly the outline of a large bird.

Cheap Aluminium.—It is stated that new works for the production of this metal on a large scale are about to be erected in Norway. A syndicate of German and American capitalists has purchased for a sum of 800,000 kroner, or over 30,000*l.*, the estate of Hafslund, near the great waterfall of Sarpsfos. It is intended to utilise the water power of the falls in a similar manner to that adopted for the falls of Foyer in Scotland. With all the new sources of output it is inevitable that the competition will bring down the price of the metal, and with the recently described improvements in soldering we should be within measurable distance of having aluminium mountings for lenses or cameras vended at a price little, if any, in excess of what would be charged for brass.

The New President of the Royal Academy.—Sir John Millais has been unanimously elected President of the Royal Academy in place of the late Lord Leighton. The election to this important office is a very simple affair. Each member at the meeting is handed a list of the forty Academicians, and places a mark against the name of the one of his selection. The Chairman is the oldest Academician present; he opens the papers and announces who has been elected. Although the election is so much more simple than that to less important presidentships, other formalities have to be gone through afterwards. Following the signing of the patent and the transfer of the gold chain and medal of office, the new President is presented to the Queen. The badge, it may be mentioned, which is enclosed in a glass case, was presented to the Academy by George III. It is always worn by the President on all great occasions, suspended from his neck by a massive gold chain. Will the Presidency of the Royal Photographic Society ever attain this importance?

The Kinetoscope and Prize Fighting.—The sporting fraternity, both here and in America, have been in a state of excitement about a projected fight between a couple of noted pugilists. On Friday last the fight came off in Texas, and a Reuter's telegram says: "The weather was cold, and a slight rain was falling. Elaborate preparations had been made for taking a series of accurate pictures of the fight by means of the kinetoscope." Of course, we do not know how the negatives turned out; but, as it is mentioned that rain was falling at the time, the result may be doubtful. If it is successful, it will, doubtless, prove highly successful to the sporting advocates of the "P. R." Some, on the other hand, may consider it a demoralising exhibition and a prostitution of modern science. However, Mr. Birt Acres, with his lantern kinetoscope, has depicted on the screen some excellent "boxing matches," which have been highly appreciated by those who have seen them, although they have not been those who would be strongly opposed to prize fighting There is, however, a difference between a friendly boxing contest and a prize fight, but one will look very much the same as the other in the kinetoscope.

Early Colour Photography.—A paragraph has been going the round of the lay press, and has been copied in one or more of our contemporaries, to the effect that, according to Dr. Vogel, Dr. Selle's method of photographing in natural colours is thirty years old, and is the invention of an Englishman named Cullen, though since improved upon by Ducos du Hauron, Dr. Albert, and himself. One likes to see credit given where it is due, but the Englishman's name is Collen, not *Cullen*. It may be interesting to our countrymen to know that Mr. Henry Collen, a portrait painter residing at St. Albans, was one of the very earliest workers of photography in England. We believe we are correct in saying that the first photographic lens the late Mr. Andrew Ross constructed, for portraiture at least, was for Mr. Collen. This lens was of the doublet form, and was non-distorting. It consisted of two plano-convex lenses achromatised, with a diaphragm between them. It had a very round field, so much so that the sensitive paper (for this was in the pre-collodion days) had to be pressed into part of a sphere between two glass plates, when it was used for portraiture. This lens was made for Mr. Collen in 1841, and is still preserved as a relic of the past.

Alum and Hypo.—It is well known that, when solutions of these substances are mixed, a precipitate of sulphur takes place, and the fear of some untoward accident governing the permanency of the film prevents the photographer putting a plate out of the hypo solution into alum till he has well washed it; but it should be borne in mind that the presence of gelatine and other substances materially retards, if it does not actually prevent, the precipitation in certain mixtures that, without its presence, would throw down a deposit. Hence, in case of frilling, it is not uncommon to see a plate thrown directly into alum water out of the hypo solution without apparent injury. Light has been thrown on the matter by the investigations of Herr N. Pringsheim, who, placing a gelatine septum between two solutions which, when mixed, produce a precipitate, made notes of the result under varying conditions. Bearing upon the topic we have under review, he found that a precipitate took place in the gelatine, and continued to increase under certain conditions. The direction of that increase was sometimes to one and sometimes to the other side of the septum. When the strength of the solutions was not equivalent, he found, in many instances, that the direction of the increase was towards the weaker solution. It might thus well follow that, in the case of a hypo-containing plate put into alum, so long as the alum was present in solution of weaker equivalence than that of the hypo, any precipitate that occurred would be towards the surface of the film, whence it could be rubbed away.

Another Fatal Cylinder Explosion.—Just now the explosion of a gas cylinder, particularly if attended with fatal results, is likely to militate against the use of compressed gases by those of an extra-nervous temperament, as well as not being conducive to their freer transit by the railway companies. Last week an explosion occurred in the chemical laboratory of Messrs. Redwood & Hailes, in Red Lion-square, Holborn, when the unfortunate experimentalist was killed and another was injured. According to a daily contemporary, the deceased was "seen holding a small oxygen gas cylinder over a gas-combustion stove, and the next moment the explosion occurred." We call special attention to this accident, because prominence has been given in the daily press to "another oxygen cylinder explosion." At the inquest (which was adjourned) it was stated that the cylinder with which the deceased was working was empty; but, even if it contained oxygen, heating it over a combustion furnace, and producing an explosion, must not be taken as militating against the safety of compressed gases for the purposes for which they are ordinarily used.

It is amusing to note the different versions of the unfortunat

accident as they appear in the press. One says: "Two young men were engaged in mixing a quantity of acid in a large steel cylinder. By some means an explosion occurred." Another has it that "the gas engine, at an artistic-card manufactory, without the least warning, suddenly exploded, which caused the greatest consternation amongst the *employés*, and, after it had subsided, two of the girls were found to have been so seriously injured that they died shortly afterwards." It is also stated in this account that "the two bodies were conveyed from the premises by the back entrance in Eagle-street."

JOTTINGS.

I HAD occasion last summer to pass an unfavourable criticism on the new premises of the Royal Photographic Society in Hanover-square. To my knowledge not a single member, either orally or in writing, has spontaneously disagreed with me. The terrible over-crowding of the meeting-room—an apartment which has always impressed me as combining the features of a disused swimming bath, a soup kitchen, and a glorified rabbit hutch—on the occasion of Mr. Alan Swinton's demonstration of electrography has, I am pleased to see, induced two or three contemporary writers to point out the inadequacy of the accommodation provided for members, which, of course, is felt with extra poignancy when unusual demands are made upon the seating accommodation.

It was most unfortunate that, on the occasion of the Annual Meeting, with a large number of members and visitors eagerly awaiting Mr. Swinton's demonstration, the opportunity of ventilating this subject could not be taken. Under the circumstances, a discussion of that nature could only have been of a mild, hasty, and perfunctory character, would not have been relished by the visitors, and might have seemed ungracious to Mr. Swinton; but it is to be hoped that an early opportunity will be given members to express an opinion on the question of the premises and other matters, for I understand that the application of the gag, on the one night of the year when many members of the Society looked forward to discussing its business affairs, has provoked a feeling of great resentment. There was one passage in the report of the Council, implying that the new premises met with the approval of members, which was a piece of imaginative writing that simply makes many of us smile, and at the same time is picturesque enough to drive a novelist into paroxysms of envy.

There are some things which are managed better in Germany than in England, especially in scientific matters. When Röntgen's discovery was announced, he was sent for by the German Emperor, and, after repeating his experiments, was honoured with a decoration, in official recognition of his work. In this happy land scientific progress is too unimportant a matter to attract the patronage of our rulers and the Government, when not engaged in plotting the annexation of big bits of distant continents, seem never so happy as when perpetrating such wicked jobs as the payment to the Duke of Saxe-Coburg and Gotha (a foreign potentate) of the vast sum of 10,000*l.* a year for a month's residence out of twelve at Clarence House, St. James's. I'm quite sure that all but a handful of Court toadies would be only too happy to relieve His Royal Highness of his obligation—at the price.

I started the previous paragraph with the intention of pointing out the need which science in general, and photography in particular, daily feels for the existence of specially provided facilities so that public experimental work of importance can be undertaken as occasion may demand and at the minimum of expense. What is wanted, in fact, is a public experimental laboratory—as free and open as are our museums and libraries. It is nothing short of scandalous that the initiative in verifying Röntgen's experiments in this country should have been left to private gentlemen and enthusiastic experimentalists like Mr. Gifford and Mr. Swinton, who went to great trouble and expense in the matter, and that facilities for the work were not available to scientific students whose purses are not overloaded with money. What could we not do with that 10,000*l.* a year! How valuable in the cause of photographic research and progress would be but a twentieth part of it if judiciously expended by the Royal Photographic Society.

A photographic laboratory with a permanent staff of investigators, however small, is, indeed, badly needed. Frequently in matters of theory, and now and then in matters of practice, we are obliged to take much for granted that would better conduce to accuracy and certainty of knowledge if it could receive the stamp of official verification or disproof. Orthochromatic photography supplies a case in point just now. Careful readers of these pages during the last few weeks have noticed the growth of a polemic on this subject, which personal feeling will probably prevent coming to a head. A and B (able practical photographers) maintain that correct colour renderings can be obtained on plates not specially sensitised for the purpose; C and D (persons of great eminence—in theories) deny the power of "ordinary" plates to give what we call "orthochromatic" effects. Now, surely, here is a matter which could be settled without much difficulty, and in which the services of a kind of English Dr. Eder would be invaluable. In the meanwhile the sooner those gentlemen who maintain the "orthochromatism" of ordinary plates put the photographic public in possession of the wonderful secret they appear to have discovered of making silver haloids sensitive in the camera to bands of the spectrum which nearly a generation of experimentalists has shown have almost no effect, the sooner they will earn the gratitude of all photographers. In the meanwhile, if I was the Britannia Works Co., Messrs. Edwards & Co., Messrs. Lumière, or Messrs. Cadett & Neall, I should still "list" orthochromatic plates and yellow screens. There is no "slump" in them visibly near at hand.

"Herkotype" is the name that has been given to the process of photogravure—minus the photography—which Professor Hubert Herkomer, R.A., has "invented" for the purpose of enabling an artist to autographically reproduce his pictures, without jeopardising what used to be called the "artistic merit" of them through the use of such a vulgar and debasing medium as photography. There are several examples of herkotype in the current number of *The Studio* by Professor Herkomer, and—nobody else. The pictures seem really good, and so do the other (half-tone) reproductions in the same issue. It has already been pointed out in these pages that herkotype as a reproductive process is intrinsically open to objections which photogravure can successfully defy. So far as can be learned, no artist but Herkomer himself has yet used this method of painting on metal plates for multiplying his pictures. Unless I am much deceived, it will have to be taught, and learned, at Bushey—that rare shrine where the worshippers of Herkomer do homage to their deity and "art," and gratefully pay so many guineas a year for the double privilege.

By the way, I have to thank the editor of *The Studio* for a couple of phrases, which I shall carefully make a note of for use at the next photographic Exhibition I go and look at. Reviewing Emerson's *Marsh Leaves*, a writer in *The Studio* (a publication which grows in beauty and value every month) says the etchings in that volume "will go far to widen the existing gulf which yawns between the crowds who depict too much of everything with harrowing insistence, and the few, such as Dr. Emerson, who impose upon their records an impressive reticence!" "Harrowing insistence" is good, very good; but "impressive reticence" is really a gem of inscrutably, irreconcilable, critical phraseology, which is eminently calculated to "knock 'em in the Old Kent Road." Armed with the phrases "harrowing insistence" and "impressive reticence," with their obvious cross changes "impressive insistence" and "harrowing reticence," I calmly await the next exhibition of the Photographic Salon. Thank you, Mr. *Studio*.

COSMOS.

CHEMICAL DEVELOPMENT IN PROCESS WORK.

SINCE the introduction of dry plates into process work, the question has cropped up in various forms as to whether the different form of development, or perhaps, to speak more accurately, the different

constitution of the image produced by chemical development, is as well adapted to the rendering of line and dot work as the old wet plate. Most operators at the outset experience greater difficulty in securing absolute clearness in the fine lines when using dry plates—by which I mean more especially gelatine plates—than is the case with wet collodion, and to a certain extent the same thing is found with collodion emulsion films. But the question is, Can the result be truly attributed to the fact of the image being formed within the film?

During the past few months I have developed some hundreds of negatives of line subjects, mostly by means of alkaline pyro and other developers of the "chemical" class, some on gelatine, but the majority on collodion plates, and, from the observations I have made, I am strongly inclined to believe that the apparently greater tendency to filling up of the finer lines, or the "closing up" of the dots in the high lights of a half-tone negative, are not due to the method of development, nor to any greater tendency to "lateral spread" of the image, but rather to causes dependent upon the exposure and the optical conditions.

In the use of gelatino-bromide plates in conjunction with the screen, it has been found desirable, in order to produce a similar result, to employ, not only a smaller stop, but also a less distance between the screen and the plate than if a wet plate were being used; but, when a collodio-bromide plate is substituted, if the reverse conditions do not prevail, at least there is very little difference required in the treatment as compared with a bath plate, although the development is practically the same as in the case of gelatine.

In order to explain the difference, it may be laid down as an axiom that, in order to secure an absolutely clear and sharp rendering of a fine line or dot, it is necessary that it be projected on to the sensitive surface with absolute sharpness and crispness, whether that surface be wet collodion, gelatine, or collodion emulsion. Carey Lea, in his admirable *Manual*, in speaking of copying, says: "To obtain a fine copy of a line engraving in which the hair lines are to be faithfully and sharply reproduced, requires a good lens, well managed. The stop must be very small, not exceeding *f*-60, or one-sixtieth of the focal length. The lens should be a large one." Now, although the copying lenses of the present day are, no doubt, far superior in point of definition to the best of the period at which he wrote, the above statement contains the gist of the matter, namely, in order to secure clear, sharp lines, a small stop must be used; not merely a stop that will give apparent or visual sharpness upon the ground glass, but a degree of sharpness that will bear a considerable amount of magnification.

Although pure line and half-tone work are essentially different in principle, the bearing of the principle on the fact that gelatine plates require a smaller stop than collodion under similar conditions is not far to seek, and the same arguments may be used in both cases. Let me take a half-tone negative to illustrate what I mean; or, perhaps, better still, let us make a series of varying exposures on a plain white sheet of paper, using a ruled screen in front of the plate. When the image of the screen is examined on the ground glass, or with a compound microscope on a sheet of plain glass, a series of dots will be obtained, varying in sharpness and intensity with the distance of the screen from the plate, and with the strength of the reflected light. But, on making a series of exposures, we shall have as many different renderings of the dots, probably not one of which represents the screen as it appears to the eye under a magnifier. The explanation of this is, no doubt, that the eye fails to recognise the gradual softening away of the edges of the light dots as seen on the focussing glass, although the sensitive plate does, and consequently, with each increase of exposure, the dimensions of the dot increase.

In precisely the same manner, though not in the same degree perhaps, when a line engraving is sharply focussed with a stop of, say, *f*-16, although to the eye, even when aided by a magnifier, the image may appear perfectly sharp, it still possesses or suffers from the same unrecognised softening of the lines, and, in proportion as the exposure is increased, so do the light lines widen, and consequently the hair lines of the engraving gradually close up or disappear. When the stop is decreased to, we will say, *f*-64, the definition is proportionately finer, and there is less softening of the edges of the lines, and consequently less closing up. I have before me as I write two negatives upon ordinary gelatine plates, the subject being a line engraving possessing considerable contrast of light and shade. One was exposed with a stop of *f*-16 for four seconds, the lens being one that, with that aperture, gives perfect visual sharpness over the whole plate; the other was exposed with *f*-40 (No. 100, U.S.) for twenty-five seconds, or equivalent exposures under the condition of light and stop. In the first the lines of the shadows and the middle tints are, to the eye at least, perfectly clear and sharp; but, as the high lights are approached, the lines become gradually more and more veiled, until the hair lines, to repeat the expressive term, are absolutely lost.

In the second negative, while the lines that are rendered with perfect clearness in the first are not appreciably sharper, the highest lights are now not sufficiently veiled to prevent their printing through on ordinary photographic paper. I should have liked to repeat the experiment with collodion emulsion, but the weather has been so unfavourable, though, no doubt, the result would have been similar, so far, at least, as the decrease of the filling up of the lights is concerned; but in this latter case, or with wet collodion, I anticipate the hair lines would have been *quite* clear.

Not as a matter of difference between chemical and physical development on the one hand, or between gelatine and collodion on the other, but purely and simply on account of the difference in sensitiveness of the different plates, in the case of gelatine the film is so sensitive to the weaker radiations that it reproduces the gradually softening lines to a degree that the collodion is incapable of doing, and consequently brings about a much greater thickening of the lines.

There is another element that should be taken into consideration in connexion with the difference in sensitiveness of the two classes of films, namely the nature of the subject photographed. It is customary to speak of an engraving as black and white, but a comparatively rough examination, especially if a magnifier be used, will prove this to be anything but the truth. The hair lines will prove to be only light grey, or, if analysed with a powerful magnifier, will resolve themselves into a series o grains of alternate black and white, and, at the same time, the fine white spaces dividing the heavy lines of the shadows will prove to be smudged or grained with black, which reduces them also to the condition of half-tones only. The lightening of the hair lines in this manner materially assists in their "filling up," especially when a quick plate is used, and the degradation of light portions of the shadows, while it does not greatly affect the sensitive gelatine plate, does so seriously with the slower collodion films.

I have had no opportunity of comparing wet-collodion or bath plates with collodion emulsion, but I have pitted the two kinds of developer, one against the other, on wet collodio-bromide plates giving, as nearly as I could ascertain by trial, equivalent exposures for the respective developers. The proportionate exposure, using pyro and silver and alkaline pyro respectively, with the same exposure, was about six to one, as far as I could judge, taking into consideration the very different characters of the two images; and, under these circumstances, there was no practical difference in the *amount* of filling up of the finer details, though it was of a different nature in the two cases. With alkaline pyro it took the form of a soft veil, filling up the interstices between the black lines, and conveying a suggestion of loss of sharpness; in the other case it was a hard, ragged thickening of the black lines, which gradually closed in, and, as it were, buried the hair lines. There was the advantage in the latter case that a clearing solution somewhat improved matters, though it did not remove the "raggedness," while, with alkaline pyro, it was comparatively useless.

It seems to me to be for line work simply a question of using a sufficiently small stop and giving a long enough exposure, when, of course, other things being equal, the more rapid gelatine plates will have a decided advantage over collodion; but, for half-tone work, the slower plates still seem to be better adapted to the purpose, since the power given by the system of working with different sized stops for different portions of picture enables us to get over the weak-

nesses of the process. This was spoken of a short time back as a "complication" in process work, but I cannot help thinking that it would be a great help in line reproduction if some similar method existed of differentiating the exposure, so as to keep back the high lights while the shadows gain force.

In conclusion, let me repeat my argument, namely, that I think much of the prejudice formerly existing against dry plates is due to the attempt to work them under similar conditions to wet, and that the difference in the results obtained under similar conditions of working is solely due to the higher degree of sensitiveness, and not at all to any inherent defects in the process, or to the action of the image or its development. W. B. Bolton.

HOW TO TAKE ELECTROGRAPHS.

We have had numerous inquiries during the last few weeks about the Röntgen shadowgraphs, as many call them, and how they can be produced, and so we propose to give sufficient details, without discussing in any way theoretical matters, to enable any one possessing the requisite apparatus to produce similar results.

The essentials are few in number, a radiant matter tube and a source of high-tension electricity being the only things necessary other than the purely photographic appliances, such as a dark slide, developing dishes. &c., which every photographer will have by him.

The radiant-matter tubes are glass bulbs, into which are sealed two terminals or wires composed of platinum where they pass through the glass, and aluminium where the wire is exposed inside the tube. Each terminal finishes up outside the tube in a little wire loop, by which it is

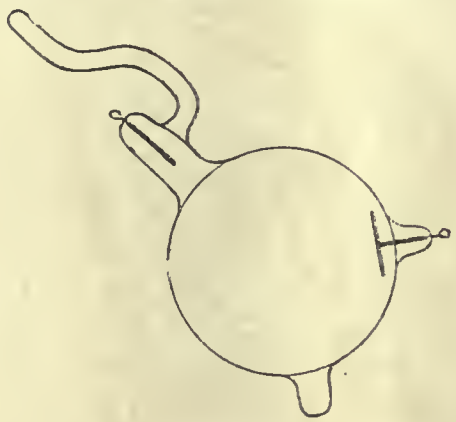


Fig 1.

connected with the source of the current. The bulbs having the terminals sealed in are then very highly exhausted, so that the merest trace of air is left in them, and, when that stage is reached, the glass tube, by which exhaustion was effected, is sealed up. Such tubes in many designs are now upon the market, and in figs. 1 and 2 we give two of those found up to the present to be the most successful in practice. Fig. 1 is a radiant-matter tube designed by Crookes for quite a different purpose, it has been used with the greatest success by Mr. J. William Gifford in his recent work. Fig. 2 is a pattern specially designed for work on Professor Röntgen's lines, and is that used by Mr. Campbell Swinton, who has found it most satisfactory. This is the shape we should be inclined to recommend unless the form shown in fig. 1 is more readily obtainable.

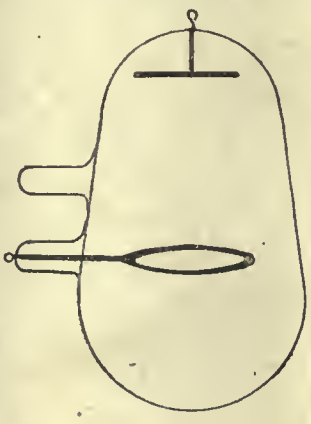


Fig 2.

So much for the tube itself. The source of current is not quite so simple a matter. It can be arranged in several ways, but each arrangement is based on the use of an intensity coil, or, what amounts to the same thing, a transformer. To those accustomed to electrical experiments of one sort and another it is hardly necessary to give more than a word of caution; but, to those who approach these instruments with only a photographic experience, it is only right to point out that a current at the tension at which it is best employed in the tube is by no means a pleasant nor a very safe thing to meddle with. So long as the original source of the current is small in amount, a shock may be merely a very unpleasant experience, but, when the primary source is great, it may not only be unpleasant, but highly dangerous.

To consider the case of batteries, or accumulators, or a small dynamo first, one or other of these sources of supply will be required together with an intensity coil. The batteries may be six or eight pint Bunsen or Grove cells, coupled in series, or their equivalent, while the intensity coil should be capable of giving a four-inch spark. A smaller coil and less battery power will answer if it is merely required to experiment with inanimate objects, coins and the like in purses, &c., and we have little doubt that successful work in this direction could be done with a one-inch spark coil and a couple of Bunsen cells, but the exposure necessary with so small and feeble an apparatus would preclude any very successful work with such things as the hands or feet of living persons, &c.

An intensity coil such as we have spoken of, giving, say, a four-inch spark, is an expensive instrument, and must be handled with care. Particular attention must be given to see that the primary source of current is not greater than is recommended by the maker of the coil, and that the insulation of the coil is not broken down by any means. A defect in this respect, which is almost invisible to the naked eye, would ruin the most expensive coil in a moment.

Essentially, the intensity coil consists of (1) a "core," which takes the form usually of a bundle of straight iron wires, (2) a "primary," consisting of a few coils of comparatively thick copper wire, insulated with silk, and wound round the core, (3) a "secondary," which is wound on the top of the primary, and is composed of a large number of turns of very fine copper wire highly insulated. There is no metallic connexion between the primary and secondary wires in any way, and, while a steady current is passing through the primary, nothing material takes place as regards the secondary. But if the current in the primary wire is rapidly stopped and started again by the circuit being rapidly made and broken, or if it is a fluctuating or alternating current, each variation in the current in the primary wire "induces" a corresponding current in the secondary wire, *but with this difference*, whereas the current in the primary wire may be large in amount, or in "quantity," but low in "tension" or "voltage," that which it induces in the secondary will be small in quantity but high in voltage; very roughly speaking, the tension increases in proportion to the length and number of turns in the secondary. In consequence of this quality, these intensity coils or transformers are largely used where very high-tension electricity is required, or where, having an alternating current at one tension, one is wanted at a different tension. Intensity coils and transformers are identical in principle, the differences being mainly in their details and design. Speaking generally, intensity coils, being made for use with the constant currents from batteries, &c., have to be provided with a "contact breaker," an automatic apparatus for making and breaking the primary circuit, which is indispensable in such cases. Transformers, on the other hand, being made for use with primary currents which are already alternating, require no such apparatus; in most cases also, transformers are made to transform the voltage within much narrower limits than intensity coils. For example, an intensity coil might very easily give a potential of many thousands of volts with a primary current of eight or ten volts, whereas most transformers are made to transform from, say, fifty to a thousand volts, or *vice versâ*.

We have felt bound to make this short and necessarily imperfect explanation at this point for the benefit of our non-technical readers, but the whole matter is one which can only be properly dealt with at a very much greater length, and which will well repay the study of any one of scientific tastes.

To return to our subject, the arrangement of coil, tube, and plate can be gathered from fig 3. The batteries, the carbon of one being connected to the zinc of the next, and so on, are joined by a couple of wires, seen coming into the figure on the left, to the two terminals of the primary of the coil, while by means of two other wires, which may be much thinner, the secondary terminals (A) are connected with the radiant matter tube (B). The hand to be photographed is seen at C, placed upon a dark slide holding the plate. The contact breaker on the coil, as soon as the connexion with the batteries is made, begins to hum; and if all is going well the tube will appear dark inside, but the glass will glow with a greenish light. The secondary terminals of the coil, and the

wires leading from them must on no account be touched while the coil is in operation, or a nasty and dangerous shock will be experienced; nor should the hand be brought too near the secondary wires or connexions, or a spark will pass and a slight shock be experienced, which, while not in any way dangerous to the person receiving it, will make him start, and, in so doing, damage may be done to the delicate tubes or other apparatus near. The primary wire is comparatively harmless.

The tube is best suspended over a table by means of a retort or table stand, which is preferably of wood, and the table itself used as a support for the plate and objects to be depicted. The sketch shows the arrange-

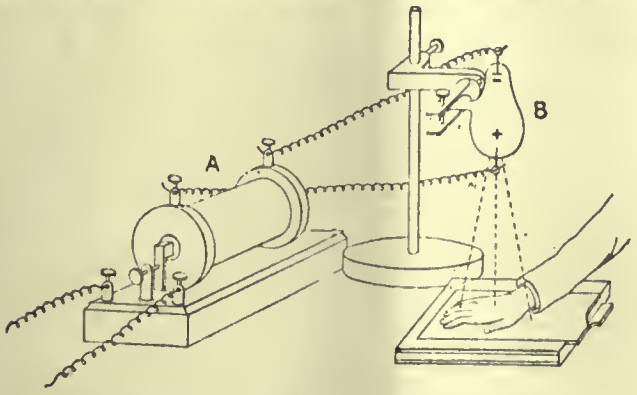


FIG. 3.

ment for making a shadow picture of a hand. A rapid dry plate is protected by having its film in contact with a piece of the fine tissue or waxed paper used in packing plates, and is then enclosed in a couple of black paper envelopes so as to be quite safe from light. If preferred, it may merely be wrapped in three or four folds of opaque paper, or enclosed in an ordinary dark slide with an ebonite, fibre, or wooden shutter. The paper-wrapper method is the best, because it allows the object to be much nearer the plate than when a dark slide is employed, and the shadow is sharper and more true to size. The plate, however protected, is laid on the table at c, in the sketch, film uppermost, the hand, or other object, placed flat upon it, and the current allowed to pass through the primary.

One or two trials should be made with a view to seeing which terminal of the two should be connected with the zinc, and which with the carbon; but this can soon be ascertained by changing them over once or twice; some coils are fitted with a commutator for the purpose. In one position the brightest part of the tube will be the curved bottom next the hand, and this is the one in which the top terminal is said to be the cathode, and should be the one selected. During the exposure the tube glows, as we said before, with a greenish light, and a sound like a miniature hail-storm is emitted from its interior. If the coil is at all powerful, and indeed for safety's sake under any circumstances, the current should not be kept on for more than a half minute at a time, after which an interval of at least half a minute should be given before again making the connexion. If this is not done, there is a great risk of breaking down the tube and utterly spoiling it, and, as they are both expensive and difficult to come by, this is not a course to be recommended.

During use, the glass of the tube gets quite hot, and after running for a little while the tube becomes "fatigued," and is almost useless until it has had a rest of some hours' duration.

We have hitherto spoken of an intensity coil and batteries, but we have seen another arrangement in use which consisted of two transformers, one specially made for very high-tension currents and a battery of Leyden jars. As such an arrangement, however, could only be fitted up by a practical electrician, and depends for its supply of current on an alternating supply from the street mains, and as any meddling with such a supply might lead to dangerous and fatal accidents, we do no more than mention it.

A third method of exciting a radiant-matter tube is by means of a Wimshurst or similar electric machine. There should not be much difficulty in doing this, it being necessary merely to separate the dischargers of the machine sufficiently far apart to prevent their sparking from one to the other and to connect their two knobs by thin wires to the terminals of the tube. It is doubtful whether such an arrangement would be of much use in experiments with living persons on account of the comparative feebleness of the effects, but with other objects it will be probably the most convenient, as it certainly is the cheapest and most compact arrangement of the three.

The photographic details call for very little remark. The developer used should be vigorous and clean in working, the exposure must be largely a matter of guesswork and so care must be used in developing to get all out that can be got. Intensification in most cases can be resorted to with advantage.

The exposure can only be gauged with the greatest difficulty, because the regular working of an intensity coil is very hard to ensure, and because the unexplained phenomenon of "fatigue" in the tube renders each exposure less effective than its predecessor. The tubes, moreover, differ very largely among each other. Some give excellent results, some have little or no effect whatever on the photographic plate, although to the eye no difference in their behaviour with the current was visible.

We have given above the practical details as far as they have at present been determined, and shall supplement them from time to time as occasion may arise. We think it only right to point out, however, that it is most essential that the experimenter using the coil, batteries, &c. should have a certain amount of acquaintance with their construction and use, more in fact than it is possible to give in the pages of a photographic paper. To such we would advise the purchase of a little shilling book issued by Messrs. Perken, Son, & Rayment entitled "Intensity coils, how made and how used," which will be found to give just the information necessary, in a lucid manner and free from technicalities.

We have spoken throughout of an electric current as passing through the tube, and in one or two other ways have used expressions which answered our purpose of explaining the *modus operandi*, but to which exception might be taken on more theoretical grounds; for this we make no apology.

The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

STAMP CAMERAS (To F. H.)—Messrs. WELLS & Co., of Southgate, write: "Seeing an inquiry in last week's JOURNAL, *re* Stamp Cameras, we beg to state we are agents for Hyatt's patent ditto (and other specialities). This camera is made for taking postage stamps from a cabinet photograph."

LANTERN SLIDES FOR TEACHING PHOTOGRAPHY.—Mr. C. H. BENNET, of 5, Richmond-terrace, Green-lane, Seaforth, writes: "I should be glad to know if it is possible for me to get the use of a few slides to give a somewhat primary description of the art of Photography. I have only a limited knowledge, and I want to try and arrange a paper with limelight views on the subject, to bring before a class of young people connected with a 'Mutual Improvement Society,' with a view of, if possible, starting an 'Amateur Photographic Society,' and, at the same time, to make it as entertaining and interesting as possible."—Perhaps some reader can supply the desired information.

FILMS OF PURE SILVER BROMIDE.—A. W. S., referring to the description of Professor Schumann's methods of preparing films of pure bromide of silver for experimental purposes, considers them unnecessarily troublesome for an admittedly imperfect result. He asks: "Why not employ a Daguerreotype plate, sensitised with the fumes of bromide alone, instead of the usual mixture of iodine and bromide? Such a film, if properly prepared, can be relied upon as consisting of perfectly pure bromide of silver unmixed with any binding material and adhere with all requisite firmness to the plate. It can be developed by the usual aqueous solutions instead of mercurial vapour, and the result, though of no use for printing purposes, would seem to satisfy all the requirements of the experimentalist when a pure bromide of silver film is the object." He goes on further to suggest, in lieu of the Daguerreotype plate, where such is not readily procurable and is probably in some respects superior to it, a very thin film of silver deposited upon glass by any of the usual methods and subsequently converted into bromide. This he considers would have the advantage, if converted throughout its whole thickness, of being free from any possible secondary action, chemical or otherwise, that might arise from the contact of the underlying film of metal in the case of the Daguerreotype plate, and the layer of bromide could be of any desired thinness or the reverse. He would be glad of the opinions of any of our readers who may have had experience in that direction.

ARTIGUE PAPER (To MR. MASKELL).—W. BENINGTON says: "I read with very great interest Mr. Maskell's article on the Artigue pigment process, which I have carefully followed since his interesting demonstration of it at the Photographic Salon two years ago, and would like to ask him one or two questions, if I may so far trespass on your space and his kindness. 1. Is the pigment employed preferably in solution or in the form of powder? 2. What colours are most suitable in such matters as permanence, &c.? and under what names should one ask for them in purchasing, so as to ensure getting the right thing? 3. What is the 'requisite thickness?' and about how much of the bichromate solution is necessary when using (for example) a black? I should like to work out these little matters myself, but unfortunately my time and accommodation, for even these experiments, are very limited."

PANORAMIC PICTURES.—"LAKELAND" would like to have the advice of any of our readers who may have had any experience in the production of panoramic pictures with an ordinary lens and camera. He says: "In the course of my wanderings with the camera I occasionally, but very rarely, come across a subject that is suitable for rendering as a panorama, or that will bear much more than the ordinary angle of view. But, even were I the possessor of a pantascopic camera or similar apparatus, I should not care to carry it about with me on the chance of using it once in three months, for, like the Yankee's 'shooting iron,' I should not want to use it oftener, though, when I did, I might, like him, 'want it bad.' But I know there are various ways of improvising panoramic pictures by joining separate prints, and also, I fancy, by making two or more exposures with a very short-focus lens on a large plate. What I want to arrive at is, which are the best or easiest methods of effecting the junction of the pictures; and which, if any, gives the most correct result as regards perspective?"—Perhaps some of the readers of this column can satisfy our correspondent.

Our Editorial Table.

CATALOGUES RECEIVED.

FROM A. H. Baird, 37 and 39, Lothian-street, Edinburgh: price-list of chemicals for photographic and experimental purposes. From Messrs. Ross & Co., 111, New Bond-street, W.: three neatly printed little booklets, descriptive of Ross-Goerz anastigmatic lenses; the convertible anastigmats; opera glasses, telescopes, &c.

A SECOND edition of *Photo-ceramics*, by W. Ethelbert Henry and H. Snowden Ward, has just been issued by Messrs. Dawbarn & Ward. It is a useful little book, the instructions and formulæ given for the process having been compiled with commendable care.

THE GEM DRY PLATES.

THE youngest of the dry-plate making houses, the Gem Dry Plate Company of Willesden-green, N.W., have recently sent us samples of the plates they are manufacturing—the "Meteor" and the "Special Portrait." The former plate is of very great rapidity and both it and the "Special Portrait," which is adapted for studio use, possess undeniably good technical qualities. We had occasion to write in favourable terms of the "Gem" plates last year, and, judging by the latest samples of them we have tried, the Company should, this season, be successful in their bid for favour. It may be accepted as axiomatic that there is always room on the market for a good dry plate.

INTENSITY COILS: HOW MADE AND HOW USED.

By "DYER." London: Perken, Son, & Rayment, Hatton-garden.

THE recent direct association of electricity, through Röntgen's X ray experiments with photography, may render this little book of service to many would-be followers in the German professor's footsteps. The elements of electrical science are plainly set forth, and chapters are devoted to batteries and their construction; how an intensity coil is made and how used; vacuum experiments, &c. The price of the book, which is in its seventeenth edition, is 1*s*.

News and Notes.

THE *Microscope* gives this formula for an ink for writing on glass with a pen as with ordinary ink: Bleached shellac, 10 parts; Venice turpentine, 5 parts; lamp-black, 5 parts. Dissolve the shellac with turpentine and stir in lamp-black.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.—A very successful *conversazione* was held on Tuesday, February 18, at the Grosvenor Rooms, Grand Hotel. Mr. Alfred Gregory's band provided music for dancing. About 200 members and friends were present.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, March 4. A lecture on the *Photo-chromoscope System of Colour Reproduction*, with lantern illustrations, by Mr. F. E. Ives. The electric power by Messrs. Peto & Radford, of Hatton-garden. Visitors will be welcomed by the members.

EVEN LETTERS ARE NOT PRIVATE.—By means of the new system, two Paris journalists have photographed the contents of a letter through the envelope in which it was enclosed. It appears that every kind of paper is not equally favourable for the operation. Nevertheless (says the *Standard*), the thick Parliamentary envelopes of the Senate and Chamber cannot conceal the secrets which may be contained within. To prevent the cathodic rays penetrating, it suffices to wrap the letter in a sheet of tinfoil, such as is used by the chocolate-makers.

TRULY the appetite grows on what it feeds. A week or two ago a photograph of the bones of a living being's hand, taken through the flesh, would have been considered sensational enough for most people, and G. W. Wilson & Co. (Ltd.) thought they were doing well in publishing Dr. Mackenzie Davidson's "shadowgrams" of hands and feet showing the skeleton. This, however, is not enough for some people, for they have received a telegram from the principal stationer in a large town in the south of England to this effect: "Photographs received very tame; send more sensational ones, such as interior of belly, backbone, brains, liver, kidneys, heart, lungs, soul!!!"—*Aberdeen Evening Express.*

THE Battersea Polytechnic held its third annual *Conversazione* on Saturday evening last to commemorate the opening of the Institute by H.R.H. the Prince of Wales, and over 1500 persons took advantage of the occasion to view the Institute and to participate in the numerous entertainments. One of the chief attractions was the Photographic Exhibition, organized by the newly formed Camera Club. Besides a large number of excellent photographs contributed by the members of the Club, Messrs. Ross, Watson & Sons, Benetfink & Co., exhibited cameras and other photographic and scientific apparatus, and the Eastman Company and Perken & Rayment sent some fine enlargements. An additional attraction was given to the Exhibition by some beautiful statuary, lent for the occasion by Mr. Horace Montford and Messrs. Farmer & Bindley, the latter firm also exhibiting some splendid specimens of ornamental stone. The room in which the Exhibition was held was gaily decorated with plants, and the effect was most pleasing and artistic. The members of the Club are to be congratulated on the success which attended their first Exhibition.

ON Tuesday, February 24, Dr. Danford Thomas, Coroner, held an inquiry respecting the death of Arthur French St. George, aged thirty-four years, a chemist, lately residing at Cotswold House, Earlswood, Surrey, who was killed by the explosion which occurred at 15, Red Lion-square, Holborn, on Thursday, February 20. Mr. Alfred Spencer appeared for the London County Council. Mr. Alfred James De Hailes, analytical chemist, stated that the premises, 15, Red Lion-square, were in his occupation. He knew the deceased, who was bringing out a patent for the manufacture of candles, and a week ago witness let him have the use of his laboratory. Deceased had one small room, and on Thursday last he was demonstrating his patent, and for that purpose used a small cylinder. The cylinder was guaranteed to stand one and a half tons' pressure, but if it was full, and was then placed on a combustion stove, nothing else but an explosion could result. Dr. W. R. Gould, 11, Lamb's Conduit-street, deposed that the top of the deceased's head and the brain had been blown into an adjoining room, fifteen feet from where the body lay. The cylinder was jammed into the ceiling, and in witness's opinion deceased must have been bending his head over it when the explosion occurred. The inquiry was adjourned pending the receipt of the Home Office inspection report.

ACETYLENE A POISONOUS ILLUMINANT.—"Twice in the course of my studies," says Dr. Birchmore, "the opportunity occurred to measure the amount that, diffused in the air of the room, would produce distinct headache in the course of a short time, and it was found to be rather unexpectedly large as compared with the product of the imperfect combustion of the ordinary illuminating gases. As stated, the air in the room wherein the experiments were conducted was known to be changed once in an hour. The cubic contents of the room was about five thousand feet, if a proper allowance is made for the space occupied by properties. The amount of gas diffused was two and a half cubic feet, or one in 10,000. Within twenty minutes a decided headache was noticed, with a sense of dizziness, that was a sufficient warning to get into fresh air. The second time, the experiment was made of remaining until the sight was slightly affected. This proved very foolish, for, in the course of an hour after leaving the room, respiratory difficulty appeared, and, in the course of a few hours, nausea, and a prostration and sense of the impossibility of exertion that forced me to remain in bed all the next day. The effects were not those of sleep, but the exact counterparts of the subjective effects of the ether narcosis—hallucination and all. Three days afterwards the heart respiration ratio was so sensitive that an attempt to walk rapidly across the Brooklyn bridge produced such a feeling of exhaustion as to compel rest."—*Electric Engineer (U.S.).*

DURHAM CITY CAMERA CLUB'S EXHIBITION.—The following were the Judges' awards:—Open Classes. Class I. (Landscapes and Seascapes), silver medal, Wm. Norrie, Fraserburgh; bronze medal, Paul Martin, Wandsworth; certificate, J. H. Gear, London. Class II. (Portraiture and Figure Study), silver medal, F. H. Flather, Scarborough; bronze medal, E. J. Farnsworth, Albany, N.Y.; special bronze medal, F. Marsh, Henley-on-Thames; certificate, R. E. Ruddock, Newcastle. Class III. (Architecture and any Subject), silver medal, H. W. Bennett, London; bronze medal, H. Sandland, Maidstone; certificate, Dr. Stainthorpe, Saltburn-by-the-Sea. Class IV. (Lantern Slides),

silver medal, J. Ward, Erdington; bronze medal, J. H. Gear, London; certificate, Dr. Stainthorpe, Saltburn-by-the-Sea. Members' Classes. Class A (Landscapes and Seascapes), medal, E. White; certificate, J. G. Stokoe. Class B (Portraiture and Figure Study), medal, J. N. Hunter; certificate, D. W. Findlay. Class C (Architecture), medal, E. White. Class D (Club Outings), medal, R. Hauxwell. Class E (Hand-camera Work), medal, H. Oliver; certificate, J. F. Hobson. Class F (One Enlargement), medal, D. W. Findlay; certificate, J. Moraon, jun. Class G (Four Lantern Slides), medal, W. Moult; certificate, R. H. Blyth. Special Prizes.—Gold challeoge medal, E. White; silver medal, F. W. Cluff; bronze medal, J. G. Stokoe.

SHEFFIELD OPTICAL LANTERN SOCIETY.—This Society held its annual *Conversazione* on the 13th inst., and its annual meeting on the 20th. The large hall in which the *conversazione* was held was crowded by ardent devotees of science, who accorded a hearty welcome to the President (Dr. Manton), who, in his address, gave a brief review of the present position of the photographic world. He pointed out that the quality of the gelatine dry plate was steadily improving, whilst the methods for ortho hromatic photography had placed an additional truth in the hands of the photographer. He also spoke of the advent of the new Jena optical glass, and made reference to the New Photography, his concluding remarks being that the scientific world was rapidly reaching the stage at which the supernatural was the natural. The Secretary (Mr. J. Maclaurin) read his annual report, which gave many interesting details of the progress of the Society, incidentally noting the increase of twenty-five members during the past year. The awards in the several competitions were then presented, the successful competitors being Messrs. S. Hughes, A. Nicholson, H. J. Clague, J. H. Lygo, and C. H. Lea. The Judges were: Prints, Mr. Slater, Liverpool; Slides, Mr. Chadwick, Manchester. These prints and slides, together with a large number of others, mostly the work of members, were on view. Some of the latest photographic apparatus and noveltiea were shown by Messrs. J. Christie and F. Motteshaw. Mr. Henry Staniforth was the Lanternist, and some sensational evidences of photographic skill and ingenuity were thrown upon the screen. The musical programme was effectively rendered by Messrs. Cunningham, Shipman, Reynolds, and Law. At the annual meeting on the 20th, the accounts were audited and passed, showing a balance in hand of *4l. 3s. 5d.* Votes of thanks were accorded the retiring officers, and the following elected for the ensuing year:—*President:* Dr. Manton.—*Vice-Presidents:* Alderman Carter and Messrs. J. Clowes and A. Nicholson.—*Reporter:* Mr. J. S. Stephens.—*Treasurer:* Mr. E. Copley.—*Secretary:* Mr. R. Glenn, 107, Nottingham-street.—*Assistant Secretary:* Mr. T. G. Allen, and a Committee consisting of nine members.

Patent News.

THE following applications for Patents were made between February 12 and February 19, 1896:—

CAMERA AND DARK SLIDE.—No. 2965. "An Improved Photographic Camera and Dark Slide." T. P. BETHELL.

PHOTOGRAPHIC MOUNTS.—No. 3026. "Producing the Appearance of Finished Mounted Photographs upon Plain Cards to which Photographic Prints have been Transferred, thus Dispensing with the Ordinary Mounts now in Commercial Use." Complete Specification. J. BACON.

HAND CAMERAS.—No. 3055. "Improvements in and relating to Hand Cameras." A. C. JACKSON.

FLASHLIGHT.—No. 3204. "A New or Improved Apparatus for Producing Flashlight in giving Photographic Exposures." Complete Specification. T. MALONI.

DEVELOPING.—No. 3404. "Improvements in Devices for Oscillating the Baths or Tanks used for Photographic and other Purposes." C. MESSAZ.

HAND CAMERA.—No. 3471. "Photographer Hand Camera." E. C. STANLEY and W. DARBIN.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

March.	Name of Society.	Subject.
2	North Middlesex	Informal Meeting.
2	Richmond	Lantern Evening: Members' Slides.
2-7	South London	Annual Exhibition.
2	Walthamstow	Slides by Members of the G.E.R. Photographic Society.
3	Brixton and Clapham	Slides by W. H. Whittard.
3	Dulwich	*Toning.* H. S. Jackson.
3	Gospel Oak	Exhibition.
3	Hackney	Lantern Evening: Royal Chapels, &c.
3	North Surrey	*Lantern-slide Making by Contact and Reduction.* T. Bright.
4	Borough Polytechnic	Slides by *Tit Bits.*
4	Croydon Camera Club	*An Introduction to Photo-micrography.* James Packham, F.R.H.S.
4	Edinburgh Photo. Society	*Photography and Art.* G. Baldwin Brown, M.A.
4	Photographic Club	*Photo-chromoscope System of Colour Reproduction.* F. E. Ives.
5	Bradford	Prize Slides.
5	Ealing	Lantern Evening.
5	Leeds Photo. Society	*More Chemicals Used in Photography.* B. A. Burrell, F.I.C.
5	Liverpool Amateur	Lantern in Use.
5	London and Provincial	*The New Photography. Notes and Examples by Various Workers.* H. Snowden Ward.
6	Croydon Camera Club	A Visit to Brin's Oxygen Works.
6	Moseley and District	Lantern and Musical Evening.
7	Birkenhead Photo. Asso.	*Photo-ceramics.* The Secretary.

ROYAL PHOTOGRAPHIC SOCIETY.

FEBRUARY 25,—Technical Meeting,—Mr. J. W. Swan, M.A., F.R.S., in the chair.

The HON. SECRETARY (Mr. Chapman Jones) announced that the Council had elected the following officers: Hon. Secretary, Mr. Chapman Jones; Hon. Librarian, Mr. E. Clifton; Hon. Solicitor, Mr. F. Iuce; and also, to fill vacancies created by those appointments, as a Vice-President, Mr. J. W. Swan, M.A., F.R.S.; and as members of the Council, Messrs. J. W. Marchant and E. Cecil Hertslet. Messrs. Mackie, Pringle, and Warnerke had been re-appointed as Affiliation delegates, and the Chester Photographic Society had been admitted to the Affiliation.

Mr. F. E. IVES exhibited

THE STEREOSCOPIC PHOTOCHROMOSCOPE.

A full description of the apparatus was given in THE BRITISH JOURNAL OF PHOTOGRAPHY for January 17 last, page 39.

Mr. T. E. FRESHWATER, F.R.M.S., then read a paper describing Messrs. Newton's simple method of

STEREOSCOPIC LANTERN PROJECTION,

and showed a series of examples. The process in question is described in our issue of January 10 last, page 24.

Mr. J. CADETT thought it very desirable that the use of coloured spectacles for viewing the pictures should be got rid of, and suggested the use of prismatic spectacles instead.

Mr. T. BOLAS said prismatic spectacles for combining the two images had been used from the earliest days of stereoscopic projection. Sutton employed them in or about the year 1855, and M. Moessard had lately introduced a new form of the same instrument.

The CHAIRMAN recalled Mr. Anderton's method of showing stereoscopic pictures with polarised light; and

Mr. BOLAS said that not only did Mr. Anderton's system permit the exhibition of coloured slides, but M. Ducos du Hauron had succeed in projecting on the screen, according to the three-colour process, two elements of the three-colour syatem being superimposed for one stereogram, and the third element for the second stereogram, and had by those means obtained coloured effects.

Mr. W. ENGLAND remarked that a great deal of light was lost by the use of deeply tinted glasses in the spectacles and in the lantern, and asked whether it was necessary to have such strong colours.

Mr. IVES said that one of chief reasons why this method of projection had not become popular was that the mixture of coloured effects on the screen was distressing to the eyes, and no satisfaction could be obtained by the observer without the use of the coloured spectacles. It must be remembered that the nerves of one colour-sensation were excited in one eye and the nerves of two other colour-aensations in the other eye, and this was very fatiguing if continued for any length of time. It was possible to project two almost perfectly white pictures on the screen, and to examine them through glasses which appeared to the eye to be smoke-coloured, each picture exciting all the nerves of colour-vision almost equally. This could be done by means of screens of aniline dyes, one to transmit a mixture of spectrum red and spectrum blue-green, and the other a mixture of yellow and violet-blue.

Mr. W. E. DEBENHAM suggested that the fatigue of the eyes caused by the excitation of the same nerves of colour-sensation might be obviated by from time to time altering the order of projection so that the red and green eye-pieces might be brought to either eye alternately, the exhibitor calling out "right" or "left" to indicate the manner in which the spectacles should be used.

Mr. FRESHWATER, in replying, acknowledged that the continued use of the spectacles was tiring to the eyes, but said it was not intended that the system should be employed for an entertainment of an hour or two in duration, but only as an interesting alternation to the ordinary method of projection. He did not think it was possible to use glasses of a lighter colour, as it was necessary that the red glass should entirely shut off the green image, and *vice versâ*. Mr. Debenham's suggestion, he was afraid, was not practicable, for the shouting of "right" and "left" would afford amusement to an audience, and rather interfere with the appreciation of the result.

Mr. J. LUNT, B.Sc., F.C.S., then exhibited a number of slides from

STELLAR PHOTOGRAPHS,

taken without a driving clock. He said his method of working was as follows: A two-and-a-quarter-inch telescope was fixed aide by side with one of three and a quarter inches; the image of a star on the two-and-a-quarter-inch was put largely out of focus, producing a disc instead of a point of light; this disc was brought across the cross wires of the two-and-a-quarter-inch instrument, and the pair of telescopes was then slowly moved by hand, so that the cross wires divided the disc into four equal quadrants, the problem being to keep the quadrants equal throughout the time of exposure. This, he had found, was not difficult; and, if the mounting was good and firm, and properly adjuated, so that the star was followed equatorially, the method appeared to be capable of general application to ordinary small telescopes, and very satisfactory photographs could be obtained. Mr. Lunt also showed photographs of the spectra of helium and argon.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 20,—Mr. E. J. Wall in the chair.

Messrs. G. E. Segall and E. T. Wright were elected members of the Association.

THE NEW PHOTOGRAPHY.

Mr. T. E. FRESHWATER said he had been making some experiments in the new photography with X raya, using only a very low current. With a low sparking coil, a much more prolonged exposure was necessary than with a high power, but he had succeeded in taking some pictures, which he passed round.

REMOVING STAINS FROM P.O.P.

Mr. W. E. DEBENHAM, although he considered that we ought not to get

yellow stains on printing-out paper now, knew that occasionally it was the case, and then more often than not in a batch. He therefore proposed to show a method of removing the stain, two being selected from a number he passed round. The procedure was as follows:—A print was put in a dish, with just enough water to cover it, and, after soaking a while, a pad of cotton-wool, wetted and rubbed on a cake of cyanide of potassium, was gently passed over the face of the print. He said the action seemed to be more rapid on the stain than on the image, and therefore there was no fear of spoiling the print.

The Hon. Secretary suggested that the use of a stronger solution might probably improve a vignette.

Construction of Lenses.

The following question from the box was read: "What is the practical method for calculating the curves requisite in a combination of Jena glass for a given focus?"

The Chairman mentioned Offord's book for amateurs, from which, he thought, one could get some given curves by which experimental work could be done; also Monckhoven's *Optics*, which, however, did not treat of the Jena glass.

The Hon. Secretary said three methods were in use—the experimental, the graphic method, and by pure mathematics.

The Kinetic Lantern.

Mr. Birt Acres, who had promised a display of his new kinetic lantern, apologised for its non-appearance, and explained his reasons for not showing the same. He had but just heard of a competitor from the other side of the Channel who had that day shown his apparatus in London, and he was not satisfied to show to the London and Provincial his original apparatus and take second place. He had machines in the hands of the best London mechanics, but unfortunately they were slow, and he was unable to show his latest improvements. He invited all present to a private view in Piccadilly-circus, where he intended to exhibit his machine, and said a few words about kineto-scopic work. The first practical attempt was made by Mr. Friese Greene, but he had never seen his work. Mr. Acres had been at work on the subject many years, and nearly thirty years ago had made drawings for the zoetrope. When he took up photography, he had an idea to make photographs and then drawing from them. At the London Convention, Mr. Muybridge exhibited pictures showing motion. He believed they were made pretty much on the same plan as he originally proposed of making photographs and then drawings. His first attempts were to put twelve small lenses together, and endeavour in that way to get a succession of pictures, but they were not satisfactory. If you wish to get the best results, the pictures must all be taken from the same point of view. He thought the greatest difficulty was the spacing of the pictures. In a French apparatus they successfully made pictures, but signally failed over the spacing, and that was the main difficulty. It is also of the utmost importance that the photographs should register exactly. Another difficulty he mentioned was with the celluloid films. When making negatives as he did, 200 feet long, one wanted a perfectly ductile film. He had discovered a method by which celluloid films can be made as nice as a piece of silk, and offered to return any film sent him in such a condition.

The Chairman had seen Lumière's Exhibition, but was of opinion that they were not by any means ready. They had used an electric lamp, with alternating current, and a peculiar disagreeable flicker was apparent. He mentioned that three years ago Edison's results were announced as coming out, but he had not seen anything of them. A worker whom Mr. Acres had omitted to mention was Anschutz, who does not actually project on a screen, but uses an aperture in a wall, while the audience sit in a room at the back, the pictures passing rapidly in front of the opening.

Mr. Debenham asked in what respect the mechanical details differed from Friese Green's machine, and whether the same instrument was used by Lumière for showing and taking the series.

Mr. Acres referred Mr. Debenham to his patent specification, and said it was absolutely necessary that similar apparatus should be used for taking and projecting. He said that Anschutz's principle was almost the same as one he had discarded as useless.

The Chairman inquired the respective exposures given to the film and to the positive on the screen.

Mr. Acres considered it of the utmost importance that the pictures should be taken at the same speed as they were shown, and explained the effect obtained by taking at forty per second and projecting at fifteen per second, and *vice versâ*. He had found an exposure of from one-thousandth to an eight-hundredth of a second quite enough for anything. In the case of a man throwing his hat to the ground, he had counted fifteen negatives. In reply to a query from Mr. Bayston as to the duration of exposure of his longest series, Mr. Birt Acres said he had perfect control over his machine, and could stop and go on as he pleased.

Mr. Snowden Ward, in the interest of historical accuracy, said that the Anschutz instrument was adopted for lantern projection, and was on view at the Chicago World's Fair. With regard also to Edison's work, he said his instrument had been running for some months in several places.

The Chairman had noticed a defect with Lumière's machine, in which flashes of bright light had appeared.

Mr. Acres considered they were due to clear spaces in the film, where, by some mechanical defect, the gelatine had been scraped away.

A New Lens.

The Hon. Secretary showed one of the most recent developments in lens-making. It was one of the new convertible anastigmats by Ross. It consisted of a double combination, each being composed of four cemented elements. The focus of the front lens was eleven and a half inches, and the back lens nine inches, while combined the focus was five and three-quarter inches. It worked at an aperture of *f*-7.

The Chairman had tested it for three-colour work, when it is essential that the images should be absolutely of the same size, and found it answered perfectly, and possessed more covering power than almost any in the market. He promised a chat on *Colour*, and to show a few three-colour slides at an early date.

PHOTOGRAPHIC CLUB.

February 19.—Mr. Alexander Cowan in the chair.

Mr. Frank Haes showed a pair of

Harrison's Globe Lenses,

bearing the name of Vogel, of Philadelphia. The lenses had been the property of the late Robert Slingsby, of Lincoln. The lenses worked at a maximum aperture of about *f*-12. The objection to this form of lens was stated to be a liability to flare spot, but this might be altered or minimised by reducing or increasing the distance between the component parts of the combination.

A general discussion upon the matter of lenses brought up the subject of the newer forms of

Zeiss Objectives,

and Mr. Bridge asked why the visual brightness of the image formed by a Zeiss lens upon the focussing screen was not noticeable in the negatives made with the lenses.

Mr. Findlay, a visitor, suggested that it was due to the fact that the Zeiss lenses were corrected for all the rays of the spectrum so far as chromatic aberration is concerned. This would make the visual image appear brighter.

Mr. Bulbeck said that he had found these lenses quite apochromatic, and Mr. Fry added that, owing to the fact that equally good definition could be obtained with a considerably larger aperture, it was possible to make good work under less advantageous conditions of light, the necessity for stopping down not obtaining. He added that such lenses could be used with a condenser and artificial light more satisfactorily than could the older forms of rectilinear lenses.

Mr. B. J. Edwards then interested the meeting with a description and demonstration of his new

Camera for Three-colour Work.

Mr. Edwards touched briefly upon the subject of the generally accepted theory of colour vision, viz., that there are three colour sensations—red, green, and blue-violet. He makes his three negatives—one for the red sensation, reaching a little higher than D in the spectrum; the second for the green, reaching as far as E; and the third for the blue-violet—all at one exposure, by means of an ingeniously arranged camera, containing two lightly silvered mirrors. The first mirror—that nearest the lens—reflects the rays upon the plate which is to receive the red, the plate being specially colour-sensitised, and protected by a suitable red-colour screen or light filter. A part of the light from the lens passes through the first mirror towards the second, which again reflects a part of it to a second sensitive plate, specially coloured, sensitised, and protected by a green light filter. The remainder of the light passes through the second mirror, and falls upon a third plate, which is colour-sensitised for the blue-violet rays, and is similarly protected by a light filter of suitable colour and character. By this contrivance Mr. Edwards stated that he, in one operation, made his three separate negatives, the positives from which, properly combined and viewed through suitably coloured media, result in a photochromoscopic picture. Mr. Edwards also stated that his instrument can be used as a viewing apparatus for combining the positives. This he showed in practice with one of his own experimental pictures of a vase of flowers. The result appeared charmingly natural and realistic, and demonstrated that the apparatus promises to be of a most useful and practical character.

In reply to questions Mr. Edwards stated that he used a Zeiss-Satz lens of seven-inch focus on the recommendation of Dr. Rudolph, and he found the correction for colour and aberrations exceedingly satisfactory. The three negatives must be developed at one time and to one depth. He preferred the method of using plates each separately sensitised for its own colour. A plate sensitised for all colours was not so suitable for his method. In development care must be taken to use as little light as possible, and that of the right sort. A dark red orange combined with green was the most suitable. In reply to Mr. Cowan it was said that the positives must be printed to the same depth, but that certain liberties could be taken in this part of the process, as the luminosity as well as the colour of the light used for viewing the resulting pictures controlled and influenced the effects obtained. Mr. Edwards said his two greatest difficulties had been with the lenses and with the mirrors: with the former to get all the images of the same size and equally defined; with the latter to deposit the silver of suitable density and colour.

Mr. Edwards's invention appeared to consist mainly of a camera for taking the "colour" negatives at one and the same time by one exposure, and the use of partially silvered mirrors, so as to avoid double reflections and residual images. The camera could be used alternatively as a viewing machine or for optical projection.

Brixton and Clapham Camera Club.—February 18, Mr. J. W. Coade (President) in the chair.—A demonstration on

Stereoscopic Photography

was given by Mr. J. Gunston. In his introduction Mr. Gunston said he did not intend to enter far into theory or to explain why it is that by looking in the glasses of the stereoscope we see two objects as one, and why, by looking too frequently in other glasses, some persons see one object as two or more. He left it for those who had made these phenomena their special study, but had brought with him a little apparatus and some specimens, and hoped to explain by example what he did not by precept. Stereoscopic photography was, in his opinion, one of the most satisfactory and interesting branches of our hobby. A paper stereograph was good, but a good stereoscopic transparency was one of the most beautiful objects photography can give us. Seeing the picture in relief enables one to form a far better idea of a place than from a single picture, and it is a common thing to hear people explain, after looking at a stereoscopic picture, "They could almost believe they were there!" A good series of stereoscopic views will delight people of all ages and of all degrees of culture, as no special attainment is required to appreciate them, all that is needed being a good stereoscope, which can now be obtained at a ridiculously low sum. Any sized camera, from $6\frac{1}{2} \times 3\frac{1}{4}$ to whole-plate, is suitable. The square pattern should be chosen, and not the kind with tapering bellows. He used a Watson's $7\frac{1}{2} \times 5$ inch Premier as a rule, and had

also brought with him a very neat instrument, the Alpha stereoscopic hand camera, by the same makers. Chadwick, of Manchester, could also be relied upon for stereoscopic apparatus. Perhaps double quarter-plate ($6\frac{1}{2} \times 4\frac{1}{4}$) is the most convenient-sized plate to use. The camera must be fitted with a central division, which will expand with the opening of the bellows, and the lenses must be paired, *i.e.*, they must be of exactly identical focal lengths, and work at precisely the same aperture—requirements which cannot be met unless the lenses have been made especially for stereoscopic purposes. Their focal lengths may vary from three to seven inches, five-inch lenses being best for average work. To save expense, single lenses may be used, and answer well for everything except for particular architectural work, as, although distortion may be evident in the prints, it is not noticed when the same are viewed through the stereoscoper. The lenses must be mounted side by side at exactly the same height from the camera baseboard, and their distance apart may vary from two and a half to three and a quarter inches, the shorter separation being suitable for distant objects, and *vice versâ*. It is convenient to mount them on movable centres; the distance between them may be then changed as wanted, three inches being most generally useful. The lenses must also be fitted with a shutter which will give an equal and simultaneous uncovering to each lens. In choosing the subjects suited for stereographs, take care to have some prominent object in the foreground, which is a most important part of the picture, panoramic views without near objects being almost useless. The focussing *must* be sharp, anything in the way of "fuzzy-types" being intolerable. Backed plates are to be preferred, and full exposure should be given, as foggy, flat, and over-exposed negatives, although useless for anything else, often make prints that look well through the stereoscope, while chalky, dense, under-exposed negatives are useless. The negatives should be free from mechanical defects, as scratches, &c. In printing from the negatives, use a glossy paper. Collodio-chloride is good; matt or rough-surfaced papers are no use. In trimming the prints, see you have a base line common to both. They should be about two and three quarter inches wide, and have about the same distance between the centres of the foreground, taking care to beware of too wide a distance apart. A special cutting shape, as supplied by Chadwick, here comes in useful. The prints must have a separation of about one-eighth of an inch on the mount, which is best of a chocolate colour. When viewed through the stereoscope, a dark mount seems to stand out in relief in front of the picture, thus giving the effect of looking at the same through an open window.

Camera Club.—February 20.—Mr. CHAPMAN JONES addressed the Camera Club on the subject of measuring

THE DENSITY OF NEGATIVES,

introducing to the notice of the members the apparatus which he has himself constructed for this purpose, a description of which has already appeared in these pages. He remarked that the terms "density" and "speed" were too much confounded with one another, although they were essentially different in meaning. Every photographer judges of his negative by its density, and will hold it up in the developing dish, or, at a later stage, to the window, in order to gain some idea of its merits in this respect. Such an examination may be regarded as unscientific, but it will often give all the information necessary. The man who sells lollipops does not need a chemical balance, nor does a carpenter require a micrometer measure, and there is, in like manner, much to be said in favour of this cursory inspection of negatives. The ordinary ear can distinguish the pitch of one note from another, while the highly trained musician can recognise any note by its pitch, and can name it; and it is quite possible that, with practice, a man of keen perception would be enabled to correctly judge, by simple inspection, of the density value of any plate submitted to him. He would need no measuring instrument, and could determine, approximately, which of two squares was the denser. Messrs. Hurter & Driffield had stated that the density of a negative could not be varied by the time occupied in development; but this he considered was contrary to general experience. Inspection, as he had said, gives all information in most cases, but certain precautions should be observed. All parts of the plate not under examination should be covered, say, by paper with a hole cut over the part to be observed. By this means very small differences of density could be detected, especially if a white screen be held behind the negative to reflect the light through it. In cases where differences of densities were very slight, or where the deposit was very thin, it would be convenient to place the negative flat down upon and touching a sheet of white paper. It was, of course, an advantage to have the compared parts near together, but, where this was impossible, one could look through each separately at surrounding objects, and thus ascertain which constituted the stronger veil. Mr. Chapman Jones then described the method of judging density adopted by Captain Abney, and that advocated by Messrs. Hurter & Driffield. In his own instrument he had followed Captain Abney's procedure, but had made certain modifications in the method, which he described. His own apparatus was home-made, and he could point to many details where it could be improved. He showed on the screen a tabular statement of the results obtained by measuring certain plates, and he was able to show how nearly they corresponded with the results obtained from the same plates by Captain Abney. They differed somewhat from the measurements given by Messrs. Hurter & Driffield's system, as might have been expected, for reasons which he had already indicated.

Dulwich Photographic Society.—February 18.—Several members gave an exhibition of their lantern-slide making. Mr. H. J. Ellis must be congratulated on his up-the-river scenes, Teddington, Chertsey, &c., and also a few views of Dulwich village and park; while Mr. Jackson and Mr. G. E. Smith exhibited pictures on various subjects. The Hon. Secretary was also complimented on his work, especially a river scene, Abindon-on-Thames, a scene from the Avenue of Trees at Tooting Common, and a group of the Junior Section of the well-known St. James's Swimming Club standing on the diving boards at the Dulwich Baths. The next meeting of the Society will take place on Tuesday, March 3, at 8.30 p.m., when a demonstration on *Toning* will be given by Mr. H. S. Jackson, assisted by the Hon. Secretary.

East London Photographic Society.—February 11, Mr. W. R. Gould presiding.—A demonstration on the

CARBON PROCESS

was given by the Autotype Company. The permanency of the results by this method, combined with the great variety of colours it was possible to select from, were two of its many recommendations. Unlike the silver process, no visible change was apparent during the operation of printing, the exposure having to be gauged by an actinometer, several kinds being shown and explained. Sensitised tissue would keep about fourteen days. For reproducing crayon drawings it was *par excellence*, giving almost facsimile copies. In the single transfer, many grains and tints of paper could be used. With the rough paper supports, much longer time should elapse between squeegeeing and developing, so as to admit of the tissue sinking well into the interstices of the paper; neglect of this point would probably result in blisters. An hour or more was advised. A large number of prints—single and double transfer—were developed, and turned out highly successful. Many large works, completely finished, were hung around the room, and were voted charming specimens of the process.

Hackney Photographic Society.—February 18, Mr. R. Beckett presiding.—Mr. A. Dean showed a negative of the shadows of interwoven strips of gold, silver, aluminium, and platinum foils, produced by the rays from a Crookes' tube through a one-inch thickness of vulcanite. Specimens of work done on the Beerneart lantern plates were shown. Mr. Roberts showed some negatives covered with peculiar markings, which had appeared during development. The plates, after exposure, had been packed in pairs face to face and placed in negative envelopes. Mr. HERBERT FRY thought that, by mistake, the plates in question had been packed with their films touching the material of the envelope, and the fibre of the paper being, possibly, slightly damp, had caused the markings to show on developing. The best way to pack plates after exposure was, undoubtedly, to place them face to face with nothing between, after seeing beforehand that the films were free from dust. They should then be packed tightly to prevent abrasion. Mr. Fry then showed McKellen's Infallible hand camera. This is of the magazine type, and is constructed to hold twelve plates or twenty-four films in sheaths. The method of changing is very ingenious, and among the advantages claimed the most important are that the changing of the plate does not depend on the instrument being held in a particular way, but acts in any position; again, when changed, the plates are held firmly, and are not loose as in some other cameras. The camera is made in various grades from quarter-plate size to half-plate. It has the usual accessories, and is furnished with a safety shutter behind the lens, which automatically closes, the latter when the camera front is opened.

Bootle Photographic Society.—February 18.—Mr. NAHUM LUBOSHEZ, of the Eastman Company gave a lecture on

PORTRAITURE AND PLATINO-BROMIDE PAPERS.

The lecturer explained that these papers were so called on account of the similarity of surface, coating, and results obtainable, there being no salt of platinum present in the emulsion from which they are prepared. Some magnificent specimens were exhibited; and the process of toning the paper shown, considerable astonishment being caused by seeing the paper stand immersion for some minutes in a bath not far from boiling point, the ability to stand this treatment being due to the fact that the image is on the surface of the paper, and not, as ordinarily, embedded in a film of gelatine.

Bournemouth Photographic Society.—February 19.—A lecture and demonstration of the

NEW PHOTOGRAPHY,

illustrated with photographs taken during the evening, and others thrown on the screen from Mr. C. Dale's lantern, were given by Mr. J. W. GIFFORD, F.R.P.S., F.R.M.S., F.S.A., of Chard. Dr. HYLA GREVES (the Vice-President of the Bournemouth Photographic Society), in introducing the lecturer, made humorous reference to the results which might ensue from the discovery. Mr. Gifford has spent a good deal of time lately in his laboratory making experiments with a view to finding out the best medium through which the "invisible rays" might be focussed. With a view to ascertain if the Crookes' radiant tube, used for the new photography, would be improved by an aluminium window, he placed an aluminium plate and a glass plate, ganged to the same thickness on the film operated on. The obstruction to light was almost equal. An ebonite doublet lens and an aluminium doublet, mounted each in a brass tube, was placed over the film, and the results were *nil*, although a plate of aluminium shows perceptible refraction. The obstruction which aluminium offers to these rays evidently balances any effects of refraction. Some perfect images of discs have been obtained by reflection. Mica and celluloid are extremely transparent to the rays, and will be most useful for protecting the sensitive film from the hand, foot, &c., or other objects, the bones of which are to be photographed. Gold leaf, silver leaf, and Dutch metal leaf were tried. Gold leaf opposed the rays most, then Dutch metal; silver leaf acts as if absent; glass gives decided evidence of refraction, like aluminium, but it is so opaque to the rays that the increasing thickness of a glass lens towards its centre appears entirely to neutralise the perceptible concentration of the rays. Mr. Gifford is aware that this is contrary to the experience of other experimenters, and therefore only advances it with the greatest reserve. Uranium glass placed on the film behaves in every way like ordinary glass. Generally speaking, the sharp definition tube should be placed as far off as possible. In the presence of several medical gentlemen Mr. Gifford photographed the arm and hand of a young lady suffering from disease in the bones of those limbs. The negatives revealed these bones as if entirely denuded of flesh, and the disease could be traced with much ease. A foot was laid before the rays with the same result, even the densest and thickest part of the limb being, as it were, "laid open to view." The lecturer went into a detailed description of most of the above and other experiments, which was listened to with great attention. Several photographs were taken during the evening, and, after development, were exhibited, very successful results being attained.

Bristol and West of England Amateur Photographic Association.—Friday, the 14th inst., at the Literary and Philosophic Club, Mr. G. W. GWYER read an interesting paper on the construction of

LIMELIGHT JETS,

explaining his theory of their correct construction, and demonstrating by experiment that an enormous increase of light was gained by those constructed on the principle which he advocated. He exhibited the jet for which he gained the first award in competition with about twenty others at the meeting of the Photographic Club last month in London, and also showed one possessing still more recent improvements which he had made. The light from the two jets was compared and tested by the photometer, which showed that the improvements approximately doubled the illumination obtained from the jet shown in London, although the nipple used with the improved jet was only one-sixteenth bore against one-twelfth on the other. The results were considered by the meeting to evidence a very great advance in the construction of limelight jets, and a vote of thanks was accorded Mr. Gwyer for his interesting demonstration. A number of lantern slides were subsequently shown on the screen by the Rev. T. Clark and Messrs. S. J. Hill, W. Moline, Thomas Letchford, and others.

Darwen Photographic Association.—Febrnary 11, the Rev. Henry Irving in the chair.—A good assembly of membere were present to hear a lecture delivered by Mr. ALFRED READ, of Blackburn, entitled

WANDERINGS WITH A CAMERA,

and, as the lecture was accompanied by slides, nearly all of which were of Mr. Read's own taking, and shown upon the screen by the agency of Mr. George Butterworth's limelight lantern, the audience enjoyed it immensely. Amongst the pictures projected were local and Continental views, comprising a number of glacier scenes, for which Mr. Read is worthy of no little amount of congratulation, as also his snap-shots on the Bowling Green, showing the different amusing attitudes of the bowlers. During the lecture, much interest was taken in the projection of a human hand taken by Professor Röntgen's method. The artistic qualities of the slides prove Mr. Read to be a photographer of no mean order.

FEBRUARY 14.—Mr. NAHUM LUBOSHEZ (representing the Eastman Photographic Materials Company, Limited) delivered a lecture on

A TALK ABOUT SUCCESSFUL PORTRAITURE AND PLATINO-BROMIDE PAPERS,

and at the outset of his remarks the lecturer expressed a wish that those of his audience who failed to accurately grasp his meaning would ask questions, when he would do his best to answer. He first dealt with the question of the paper to be used, and pointed out that the platino-bromide paper was very sensitive. The difference between this class of paper and the ordinary bromide paper was that it gave an absolute photographic image, whilst the others required a certain amount of dodging and retouching to make a finished photograph. The platino-bromide paper is very thinly coated, and this gave the image a clear surface, whilst the other papers, being thickly coated, the image is viewed through the coating itself, as in the case of a negative, the latter being coated with exactly the same emulsion, only that the extra-rapid plates contain more silver, and all plates require a thicker coating. The Eastman Company's platino-bromide paper is about as sensitive as the average ordinary plate. To make a good portrait, there were a few essential conditions, one of which was that there should be absolute whites and pure blacks. When looking on an image of black and white, one would see that the white was nothing more nor less than the paper itself, seen through the photographic coating. The photographer should take care that the whites of the picture are not stained, as the photograph with the least stains upon it would certainly secure the best prize. This was one of the essential points, and a perfect picture would not be the result if a developer was used which had a tendency to stain the paper or attack the delicate coating. The lecturer then proceeded to speak of the methods to be employed in order to get pure blacks, and stated that the developer used in the process had much to do with this. Mr. Luboshez then went on to say that pyro was a developer that when applied was practically colourless, but immediately it came in contact with the paper it changed to a dirty brown, and whatever came in contact with it was stained in the same way. Many different developers were mentioned as being suitable for bromide work—amidol, metol, glycin, ferrous oxalate, and almost all the new developers—but the one to be employed was that which the worker was best able to control, as it was a matter of individual taste. Not only is it necessary that the worker should be able to control the developer, but every step of the work until the image is perfectly finished. The highest possible result can only be produced when each and every step of the work can be controlled, the developer especially so, and not to let oneself be controlled, as the moment they allowed their work to get the upper hand they were at sea. In order to be able to control the developer used there must be time, and some developers do not allow the necessary time. The lecturer enumerated certain developers, pointing out some of the defects, and mentioned, incidentally, that the manufacturer of a developer was once asked by a photographer, who was at the time suffering from skin irritation, caused by using this certain developer, what was the antidote, and the manufacturer replied that he was not aware of any. Mr. Luboshez strongly recommends the ferrous-oxalate developer as being in every way the best for bromide work, for, no matter how long it is kept on the paper, it does not change its condition. One good feature of this developer is that it can be mixed, the different proportions as required; for instance, if an image is wanted strong in the blacks and clear in the whites, the developer may be mixed accordingly. Much good advice was given by Mr. Luboshez on this phase of photography, and amongst other things he warned his audience against doing their work in a mechanical way.

Leeds Camera Club.—February 20.—Mr. H. F. WIGGLESWORTH gave a lecture and demonstration on

ACETYLENE.

Mr. Wigglesworth said that acetylene or "electric gas," as it is sometimes called, is spoken of as a new gas, but it is by no means new, because it has been known to chemists for a large number of years. In 1836 Edmund Davy was aware of its existence, and he at that time called it "klumene." A few years later, Bertholet gave it its present name of acetylene or ethine. Whilst working with an electric furnace, and endeavouring by its aid to form an alloy of calcium from some of its compounds, Mr. T. L. Wilson noticed that a mixture containing lime or chalk and powdered anthracite fused down to a semi-metallic mass under the temperature of the arc, and, when found not to be the substance required, was thrown on one side into a pail of water; but, after a time, the overwhelming odour evolved enforced attention, and, on the application of a light, a luminous but smoky flame was given. Mr. Wilson then turned his attention to this, and found that in a properly constructed electric furnace powdered lime or chalk and carbon could be fused, and the result was the formation of calcium carbide. On the addition of water to this, a double decomposition takes place, the oxygen of the water combines with the calcium and forms oxide of calcium, and the hydrogen unites with the carbon and forms acetylene. The carbide is a dark grey substance, and, on the addition of water to one pound, about five feet of gas is given off. Acetylene is a clear, colourless gas, with a very strong odour resembling garlic. Ordinary burners, through which coal gas is consumed, are useless for showing acetylene to advantage, and it is recommended to use 0000, 00000, or 000000 Bray's burners. The former burns about one and a quarter feet, the next one foot, and the latter two-thirds of a foot per hour. The carbide can be purchased commercially at prices varying from 1*s.* to 5*d.* per pound, and several generators have already been made, but, doubtless, a cheap one will very soon be put on the market, so that it can be used in private houses. If ordinary coal gas costs 2*s.* 4*d.* per 1000 feet (as in Leeds), and calcium carbide 6*d.* per pound, the relative cost of both gases would be, light for light, 2*s.* 4*d.* for coal gas, and 4*s.* 6*d.* for acetylene, so that, if the carbide can be produced and sold at 3*d.* or less per pound, coal gas will have a strong competitor for lighting purposes. Professor Lewes, in a lecture a short time ago, gave the following figures, which require no comment:—

Burner.	Gas consumed.	Carbon dioxide produced.	Adults.
Flat flame burner, No. 6	19·2	10·1	16·8
,, ,, ,, ,, 5	22·9	12·1	20·0
,, ,, ,, ,, 4	25·3	13·4	22·3
London Argand	15·0	7·9	13·1
Acetylene	1·0	2·0	3·6

The last column shows the number of adults who would exhale the same amount of carbon dioxide in the same time. The heat given off from the acetylene gas is very small compared with ordinary coal gas. Acetylene is a very powerful explosive if mixed with twelve or thirteen times its volume of atmosphere. If two or three burners can be arranged in suitable positions, no doubt use can be made of acetylene for lantern work, but for photographic purposes it will doubtless not be of much use, in consequence of the flame not being strong in actinic rays. At the close of the lecture Mr. Wigglesworth showed the gas burning through 00000 burner, and when compared with coal gas it was acknowledged to be far superior in every way.

Liverpool Amateur Photographic Association.—February 20, Mr. Joseph Earp in the chair.—Dr. D. J. W. Ellis, F.E.S., gave a demonstration on

PLATINOTYPE TONING

of gelatino-chloride paper. He described the *modus operandi* in detail, and successfully toned a series of six prints, all from the same negative, to various shades, from warm brown to dark purple.

Moseley and District Photographic Society.—February 21, Captain Davidson (Vice-President) in the chair.—Before an exceedingly large muster (about 150), amongst the number many of the city and local surgeons, Mr. HALL EDWARDS, L.R.C.P., F.R.P.S. (the President) lectured on

RÖNTGEN'S RADIATIONS.

He began by explaining the method in which these rays were produced. Having shown an ordinary vacuum tube, and passing a current of electricity through it, the colours produced were very vivid; but that was not what was known as X rays. These rays were produced in a Crookes' tube, a tube exhausted to a much greater degree. The current he had got at his disposal was not strong enough to give the X rays; but, when they were produced, there was not the light as in an ordinary vacuum tube, but only a slight green light at one end and violet at the other. The lantern was then called into requisition, and slides from Dr. Hall Edwards's negatives were thrown on the sheet. Many and interesting were the slides, and one which the lecturer said was specially interesting, as it showed one of these writing-pencil patent folding pocket compasses, the lead of the pencil coming out slightly, but the cedar wood was quite transparent to the rays. But now, in contradiction to what he had on a previous occasion stated, he thought that nothing was opaque to these X rays. This slide, he said, was an argument in his favour, for, where the metals crossed, there could be distinctly seen the extra density on the screen. The rays would pass through anything if long enough were given. The slide of the lady's hand, wherein was deposited the needle, brought forth applause, for, by the aid of a negative taken by the doctor, the surgeons at the Queen's Hospital were enabled to extract it, although previously having failed to find it; also the hand with the bullet in it called for special applause. The radiograph showed the bullet quite plainly, and the lecturer stated that he gave longer exposure to this hand, as he knew that lead was one of the most impervious substances to these rays. In reference to recent statements about getting images with 3*l.* 3*s.* apparatus, he stated that he did not say it was impossible, but thought that it may possibly be noised abroad by a cheap coil dealer. He would not be now surprised to hear of negatives being taken by means of the scullery house mangle.

Glasgow and West of Scotland Amateur Photographic Association.—February 17.—The Council were empowered to take the preliminary steps for holding an International Photographic Exhibition in Glasgow in 1897. Mr. D. C. Coghill lectured on

PHOTOGRAPHY IN RELATION TO LETTERPRESS PRINTING AND PROCESS ENGRAVING.

He explained, and showed by examples, the many ways in which pho

graphy is employed by printers for purposes of illustration and reproduction. After illustrating the general principles of mechanical engraving by transferring a line drawing to zinc and etching the plate, he described the photographic methods of preparing plates for etching. The requirements of half-tone work were then explained, and a reversing mirror and lined screen were exhibited. Details of the bitumen and enamel processes were given, and blocks by each process were etched and printed successfully. The three-colour process was also described, and fine examples of colour-printing were exhibited. Many hints as to the kind of photograph or drawing best suited for reproduction, the paper for printing, and the care of blocks, were given during the lecture. Mr. Coghill was assisted by a number of his own staff of printers, and by representatives of the Regent Engraving Company.

FORTHCOMING EXHIBITIONS.

1896.

February 23, 29..... Woolwich Photographic Society.

March 2–6 ..... *South London Photographic Society. Hon. Secretary, Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.

,, 3–6 ..... *Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

☞ Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

COLOUR-RENDERING ON ORDINARY PLATES.

To the EDITORS.

GENTLEMEN,—As I was present at the meeting of the Croydon Camera Club when Mr. White gave his most able paper on *The Photography of Colours*, and having given my experience as corroborative of his own as regards the behaviour of ordinary plates with the yellow screen, in Mr. White's absence I shall be very glad to meet Mr. Wall for a practical defence of the position which I understood Mr. White to take up as regards colour rendering by non-colour-corrected plates. I object to academical discussions at either of the mentioned societies, but suggest the selection of some accessible stained glass window for the practical test with the camera. It must be understood that Mr. White did not contend that prolonged exposure of the plates in question, without a screen or yellow illumination, would alter the rendering of the blues and violets. However, nobody who tries prolonged exposure will find other result than Mr. White, in the better, if not perfect, rendering of the yellows and reds, but he must use the screen to suppress his blues and violets whether he uses colour sensitive or other plates. Thanking you, sir, for your space,—I am, yours, &c., J. T. SANDELL.

The Sandell Works Company Limited, South Norwood, London, S.E., February 24, 1896.

To the EDITORS.

GENTLEMEN,—Mr. Punnett (p. 124) is, no doubt, quite right about the difference between aurine and aurantia. Aurine has been put up for me when I asked for aurantia, and several other dyes have each two or more different trade names. Aniline reds, all practically alike and indistinguishable in the spectroscope, are sold as roseine, fuchsine, magenta, and azaleine. It is unfortunate that some dealers in dyestuffs create confusion by using inexact names for chemical products.

My strictures apply only to the dye which I named in my letter, and not to aurantia, which, if it is something quite different, may very well give quite different results. The dyes which I have named give the results which I have described, and this Mr. Punnett, I am glad to see, now fully admits.—I am, yours, &c., F. E. IVES.

To the EDITORS.

GENTLEMEN,—I have no wish to enter into a controversy with Mr. Punnett, but his comment on my letter (p. 15, January 3) is so very vulgar, that I ask to be allowed a few words in reply.

The object of my letter was to express my keen and sincere appreciation of Mr. Ives's labours to improve our knowledge of orthochromatic photography, and to suggest a more generous recognition of what is due to him; this is not flattery. Mr. Punnett does not know the meaning of the words he uses.

Mr. Punnett, in his first letter (p. 735, November 15), says: "animated by Mr. Ives's article, we made a screen of chrysoidine and deep naphthol yellow, but could not obtain satisfactory results." In his letter this week (p. 124) he quotes fourteen experiments, twelve of which are admittedly valueless. One is the old combination advised by Mr. Ives, which he now describes as yielding almost perfect results; and the last is a combination of his own, which he thinks is equal to the one first recommended by Mr Ives, but with which he failed to get satisfactory results in November last. This means, if it means anything, that he might have accepted Mr. Ives's formula in the first instance, and saved himself the trouble of recording a number of worthless experiments.

The obvious aim of Mr. Punnett's first letter was to confuse the issue by insinuating that Mr. Ives's orthochromatic results on ordinary plates were due to some latent orthochromatic quality in the plates made by a firm in which Mr. Punnett is interested—plates which Mr. Ives admitted using and spoke well of—How very generous! As to the dye, Mr. Punnett is not so accurate as his erudite references would lead one to expect; he did not advocate aurantia in his first letter, but a substance he called aurentia; that being so, is it any wonder some confusion arose as to what substance he really did mean?

It would be presumption on my part to forestall any comments Mr. Ives may wish to make on Mr. Punnett's letter. I have therefore only touched upon those points which possibly come better from an outsider. Certainly Mr. Punnett might with advantage adopt the advice he proffers to me. Advice is cheap—cheap as free advertisements.—I am, yours, &c.,

Roundhay, February 24, 1896. F. H. BURTON.

To the EDITORS.

GENTLEMEN,—Mr. Hector Maclean's letter in your last issue displays an ignorance of facts, and is so full of unwarrantable sneers and innuendoes, both astonishing and unworthy in a man of his position as President of a Society, that I shall let it severely alone.—I am, yours, &c.,

E. J. WALL.

THE KEEPING QUALITIES OF SENSITIVE CARBON TISSUE.

To the EDITORS.

GENTLEMEN,—We see on all sides the increasing popularity of the carbon process amongst all classes of photographers, and this in spite of two great disadvantages which it possesses, namely, the limited keeping qualities of the sensitive tissue, and the necessity of transferring the image, disadvantages which, if effectually removed, would give an enormous impetus to its use. Experimenters have for some time been at work on the latter problem; but, although I have been a fairly constant reader of the photographic press for several years, I do not recollect seeing one paragraph having mention of the former, yet this would certainly be a very useful field for experiment.

We know, of course, that moisture exerts a considerable influence in hastening insolubility, and the idea struck me, as, doubtless, it has others also, of keeping the sensitive tissue in an airtight calcium tube, such as is used in platinotype work, in order to see if damp was the only cause of insolubility. I discovered it was not.

The effect of keeping the tissue in this dry state was naturally to render it exceedingly brittle, so the simple expedient at once suggested itself of softening the pieces required for use by holding them for a minute or so in the steam of a kettle. By adopting this method I was able, at various times up till October 1895, to print transparencies on tissue obtained from the Autotype Company in the end of September 1894, over twelve months.

Again, some standard brown, bearing the date of November 1894, yielded good prints, and was readily soluble up till April 1895; but, towards the end of July, on again trying it, it was found to be insoluble.

It is noteworthy that these two batches, as well as some to be referred to later on, were, as soon as procured, kept together in the same tube, under identical conditions, notwithstanding the difference in the time during which they remained good.

At Midsummer 1895, I obtained four packets of sensitive tissue of different colours—black, brown, sepia, and red chalk—and, not being able to use them at once, I placed them in the calcium tube; but to my surprise, on attempting to develop them in a little over three weeks' time, I found that they were hopelessly insoluble, although the transparency tissue previously mentioned was still perfectly good.

This clearly showed that there was some element of decomposition in the tissue itself, apart from the conditions of storage.

On speaking once to a representative of the Autotype Company, I mentioned the subject, and he stated that, in his experience, the temperature and state of the atmosphere at the time of sensitising the tissue had a great influence on its keeping qualities, some, sensitised in the heat of summer, often being unfit for use in a day or two, whereas it is well known that, if sensitised in cold weather, it may be kept for three weeks or a month without any special precautions.

It is evident, therefore, that, if these unknown factors could be discovered and understood, it might be possible to manufacture a tissue of vastly increased keeping properties.

I trust that this may be the means of eliciting correspondence on the subject, as some amongst your numerous readers must have made similar observations to my own, and perhaps carried them a great deal farther.

Believing that I have suggested a by no means unprofitable direction for investigation,—I am, yours, &c., R. WELLER.

Sandycombe, Kew Gardens, February 24, 1896.

WATKINS DEVELOPING COMPETITION.

To the EDITORS.

GENTLEMEN,—The Judges' report of the above does not, I fear, give competitors and others much useful information. It is not even stated how the prize-winners attained their results, and those wishing to continue similar trials are given no help from the experience gained in these. The results (except those of Messrs. Edwards) have now come into my hands, and, as I find there is much to be learnt from them, I am drawing up a report of what each competitor has done, and summarising the results.

When I announced this competition, I stated my anticipation that competitors "will be able to show slight changes of gradation (independently of fog and stage of development), but only in certain limited directions." I was wrong as regards the word "slight," for a decided change has been proved, but the few competitors who have shown change of gradation have all done so with the aid of strong (over eight grains to an ounce) pyro developers.—I am, yours, &c., ALFRED WATKINS.

Hereford, February 23, 1896.

PHOTO-CHROMOSCOPES.

To the EDITORS.

GENTLEMEN,—Mr. Edwards (p. 125), referring to my statement (p. 109), that the photo-chromoscope shown by him was "constructed in accordance with my patent specifications, and for the purposes specified therein," and is an "infringement of my patent claims," says I "must know such statements to be incorrect." On the contrary, I know them to be correct. This instrument, as constructed by Mr. Edwards, is my own by priority of invention, publication, and patent; there is nothing in it that had not been fully disclosed before Mr. Edwards' first date of record, and it infringes some of my most important patent claims.

Mr. Edwards says that, had he been content with the use of coloured glass reflectors, he would have patented the device before I did; but I cannot make this statement fit in with other statements, facts, and dates on record. In the first place, he did not need to wait to "conceive the plan of using plain glasses slightly silvered on one surface" (p. 94), any more than to invent the use of coloured glass reflectors, because both of these ideas had been disclosed by me, in a British patent of March 8, 1892, and in a paper read at the Society of Arts, May 17, 1893. But not even an application made immediately after the time when he says he tried coloured glasses (*one only* of the methods specified in my patent), "fully *six* months" before he applied for provisional protection, would have made his patent antedate my own, which was filed nearly *eight* months before his. And, then, his provisional specification does not disclose several important features which were shown and claimed as new in my patent specification filed July 3, 1894, and which do not appear in Mr. Edwards's records until December 19, 1895, four or five months after they were shown in an illustration of my instrument which appeared in at least three London photographic journals.

Mr. Edwards also makes claims with reference to the use of separate and different plates with a single exposure, and triple prints, two elements of which are on separate glasses, and the third on a thin film between them. Both of these ideas were also disclosed by me years ago, with differences of detail only; the first in a lecture at the Franklin Institute, in Philadelphia, December 19, 1890, on which occasion I showed the camera in which I then used three separate and different plates with one exposure; and the second, in my book, "A New Principle in Heliochromy." It is evident that every one of my cameras, single-lens or otherwise, has been adapted to the use of separate and different plates if preferred, and that the principle is no less my own because I have more recently recommended a procedure which I believe to be, on the whole, far better.

It appears, therefore, that Mr. Edwards has been so far behind time with *all* of his ideas, that he has "no standing, either in fact or in law." Other statements which he makes in his letter are not justified by the facts, but an adequate reply would occupy much space, and I hope that it will not be made necessary.

I cannot reply fully to Mons. Nachet until I have seen his patent, which I believe has not yet been published. One statement, however, is untrue, and another is so incomplete as to appear to be calculated to mislead; so that, altogether, Mons. Nachet's communication sounds to me like mere "bluff." I *have* a patent in France, which, under French patent law, protects my invention there from July 3, 1894; and the only claim which Mons. Nachet quotes from his patent of March 29, 1894, is anticipated (as it stands in the quotation) in a French patent granted to me in 1892. What his additional certificates may contain is a matter of no importance as affecting my patent rights.—I am, yours, &c.,

F. E. IVES.

PHOTOGRAPHIC COPYRIGHT.

To the EDITORS.

GENTLEMEN,—Under above heading, in your issue of 21st inst., there appears a letter from Messrs. Patrick & Sons, of Edinburgh. Will you allow me, in the interests of the whole landscape publishing trade, to explain, firstly, the reasons which induced the Committee of the Photographers' Copyright Union to frame Rule 23; and, secondly, to point out what has been the practical result of the rule?

Owing to the enterprise of the editors of the illustrated press, and the wonderful development of all classes of process work, an entirely new and profitable source of income has been opened up to the publisher of landscape photographs. It only gradually dawned on the latter that he was justly and fairly entitled to some compensation for the use of his picture, which had cost him time and money to produce. That was the first stage; then came the time when we all charged whatever seemed good to us, with the result that we under-quoted each other, and generally cut each other's throats all round. Then the Copyright Union took us under its wing, and suggested that we ourselves should fix a minimum fee and stick to it. This we did, fixing the same at 10*s.* 6*d.*, and I shall presently point out how the rule has worked.

In order to complete my case, I must next turn to the users of our copyright pictures, the editors and publishers of the illustrated press. It is here that the best work of the Union has been done, and a result has been accomplished which speaks volumes for the tact and administrative powers of the President and his lieutenants. I have said that the reproduction of landscape photographs in the illustrated press was a new trade for the photographer, and in no less degree it was a new one for the editor. At first the latter did not see why he should pay anything for the use of one of our photographs; he never had done so, and he didn't see why he should begin to do so. Now, no man, single-handed, can either fight or convince an editor, and I have no hesitation in saying that, had it not been for the courteous, but well-armed, front displayed by the Photographers' Copyright Union, a most valuable part of our annual turn-over would have been, in great degree, lost to us. In order to illustrate the working of the rule, I must give my own personal experience, which I imagine to be the average one. During the time my firm have been members of the Union our income from fees has steadily increased, and now amounts to more than a few hundreds a year. A large part of this sum is earned by negatives which only command the minimum fee of 10*s.* 6*d.* As a proof, however, that a really good subject will command a good price, I may mention that during 1894, in some hundreds of cases, we obtained from twice to ten times the minimum sum fixed by the Union. We started with the idea of treating the editor as fairly and honestly as we could, and I am glad to have this opportunity of placing on record my appreciation of the generous and straightforward way in which the illustrated press have met the Photographers' Copyright Union. I may safely say that, in the great majority of cases, both editor and photographer are now agreed that 10*s.* 6*d.* is a fair and reasonable price to pay for the use of the latter's property, and I have never found an editor to refuse a higher sum for a picture of exceptional merit or interest.

I think Messrs. Patrick & Sons will find in the end that Rule 23 is their greatest safeguard and protection, and our own experience has proved, over and over again, that we gain far more than we lose by its observance. In reply to a communication requesting a lower quotation than 10*s.* 6*d.*, a courteous letter, stating that the latter sum is the minimum allowed by the Union, and that, consequently, the writers are unable to give way, will, in most cases, bring about the desired result. Every day membership in the Union is being extended, and every photographer who enlists under its banner strengthens our cause by lessening the danger of unfair competition and underselling.

The result of repealing the rule, or of reducing the minimum fee to simply a nominal amount, would be to cut the ground away from under our feet. Whatever quotation we gave, we should know to a certainty that some one would under-quote us, and, what is now a fine and profitable trade would soon be of no use to any of us. The establishment and loyal observance of the rule as it stands puts us all on a level. By this time the editor of any paper of importance knows as well as we do that the minimum fee is 10*s.* 6*d.* This he is prepared to pay, and his only aim now is to get the best picture he can find. This state of things will only produce a fair and friendly rivalry, and an added anxiety on our part to produce the best possible work; unfair competition and underselling (which have ruined so many kindred trades) will be an impossibility.

Messrs. Patrick & Sons are, of course, right in saying that there are people who will not pay the minimum fee allowed by the Union, and who will use every endeavour to find a cheaper market; but these latter gentlemen will find it more difficult every day to obtain such cheap illustrations. Every photographer who can be persuaded to join our Union takes a man out of the enemy's camp. A man has everything to gain and nothing to lose by becoming a member, and I feel sure the influence of Messrs. Patrick would be sufficient to obtain many new members in their part of the world. These are still the early days of the Union, but, when we see what has been already accomplished by its instrumentality, we are certainly justified in hoping and expecting that the annoying cases referred to by Messrs. Patrick will become daily less frequent.—I am, yours, &c.,

February 25, 1896. E. FRITH

(*F. Frith & Co., Reigate*).

To the EDITORS.

GENTLEMEN,—In your issue of February 14, Mr. Henry Gower defends Rule 23 of the Copyright Union against the criticism of a contemporary, and argues that a rule is made to be observed; that is precisely why many provincial photographers (myself included) are prevented from joining the Union, as we know that we should often be compelled to break that particular rule.

We prefer to remain outside a body, whose general aims have our heartiest approval, rather than make a promise we should not be able to keep.

The position of the provincial photographer is quite different to that of his brother professional in London; no doubt, it would be greatly to the advantage of the latter, and of the publisher of photographs (whose business has, no doubt, suffered severely during the last few years from the competition of cheap reproductions), to persuade every photographer in the country to make a charge for every one of his photographs that is reproduced. But the provincial man knows that his interests, and those of the London photographers, especially those who work largely for publication, are not identical, and he fails to see why he should throw away chances of obtaining work in order to put a lever into the hands of the London publisher of photographs.

There is no doubt that Rule 23 prevents many from joining the Union. I know at least three in Birmingham.—I am, yours, &c.,

HAROLD BAKER, Photographer.

58, *New-street (opposite Colonnade), Birmingham, February*, 18, 1896.

THE RECENT LIMELIGHT COMPETITION.

To the EDITORS.

GENTLEMEN,—Mr. Gwyer has declined my offer to submit our respective jets to independent experts, and has therefore no right to question the verdict given at the public competition on January 22 last.

If he advertises or allows any one else to advertise that "the Gwyer jet proved the best at the jet competition on January 22," he will be circulating a statement which is incorrect.

I am sorry Mr. Gwyer cannot calculate that a diameter of ·085 gives an opening of more than one third larger than ·072, but the fact remains.—I am, yours, &c., W. SCARBOROUGH.

Crouch End, February 22, 1896.

OPERATORS' GRIEVANCES.

To the EDITORS.

GENTLEMEN,—Many number of times have I read in the JOURNAL, with no little interest, "Airings of Photographers' and Photographic Assistants' Grievances;" therefore I shall be glad if you can find a small space for the following:—"Photographers and their Advertisements" I have often wondered why they don't state the wages when advertising for an assistant. I am sure it is quite as easy to do that as to say, "Good wages given." They must know perfectly well the wages they can afford, or better still, they "intend paying." Can any photographer assign any reason for not doing so? Surely, they can't be ashamed to advertise the salary, if it is a fair one; but this is where the photographer's weak point lies.

Another item of importance is the "Keeping of Specimens," but which is not evidently considered so by photographers generally. They usually receive specimens, in answer to their advertisements, on a Saturday morning, and are detained by them *over* the following Saturday, which debars the assistant (unless he has two sets of photographs of himself—and not many have) from answering any situation he may see in that week's JOURNAL. They are not even returned then, unless a second application is made for them. This is gross and selfish neglect on the photographer's part; yet he is the first to cry out about not being able to get an assistant to work for his interests. No wonder, for at present they have a very one-sided way of doing business.—I am, yours, &c., ABOVEBOARD.

February 21, 1896.

AN APPEAL.

To the EDITORS.

GENTLEMEN,—For over thirty years Mr. William H. Harrison has been engaged in matters connected with photographic progress, and he has beyond doubt materially contributed to that progress. He has been a regular contributor of useful articles to photographic journals, especially THE BRITISH JOURNAL OF PHOTOGRAPHY, and latterly *Photography*. For some time he was editor of the *Photographic News* His nature and manner being singularly unobtrusive, his works were frequently known where his name was unknown.

Among the special subjects investigated and written about by Mr. Harrison have been the following: the methods of preserving wet plates in working order for considerable periods; devices for rendering tourist cameras lighter without loss of efficiency; he was the first to make a gelatine emulsion and to develop it with alkaline pyro; but pressure of other work prevented him from following up his remarkable discovery. (See Mr. Bolas' lecture at the Photographic Society, 1892.) Briefly, during thirty years Mr. Harrison has steadily worked on photographic matters, has materially assisted in progress, and has never tried to make pecuniary gain out of his work. He is now, through no fault of his own, stricken down with brain paralysis, and scientific writing has not enabled him to lay up for old age or illness. We, therefore, with much confidence appeal to the photographic world to assist in this most deserving case. Contributions will be gladly received and acknowledged by F. H. Varley, 82, Newington Green-road, London, N.—We are, yours, &c.

ANDREW PRINOLE, FREDERICK H. VARLEY.

THE THEATROGRAPH.

MR. R. W. PAUL, of 44, Hatton-garden, is the inventor of this piece of apparatus, which is designed for the projection of kinetoscopic pictures on to the lantern screen. It is constructed of steel, gun metal, and aluminium, and of such size as to go between the condenser and objective of an ordinary lantern. The film containing the photographs is drawn from the spool at the top of the instrument, and passes under the rollers and presser pad in front of an oblong aperture through which the light passes, then under an aluminium sprocket wheel to a second spool, on which it is automatically wound up. Each turn of the horizontal shaft, which is driven from a small hand wheel, actuates a cam, which instantaneously shuts off the light, and at the same time the sprocket wheel is acted on by a steel finger, causing it to move forward the space of one picture; the film is then locked in position for projection, the shutter opens and allows the picture to be projected. In this way the film is at rest the greater part of a revolution, giving a bright image. The rapid revolution of the shaft causes successive pictures to appear without discontinuity, as in the kinetoscope, until the whole scene has been presented.



We witnessed the theatrograph in actual operation, and the projected images, with the lifelike motions of the figures, were successfully shown. If the theatrograph, together with series of kinetoscopic photographs, is available at reasonable prices, it should supply an extremely popular addition to the resources of the lantern lecturer.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

"NIKKO," "BOHEMIAN," P. PARSONS, C. C. BATES, "TABLEAUX VIVANTS," and others in our next.

LENSES.—PHOTOIC ART says: "I am about to erect a small studio, about 23×9 feet, with a lean-to roof, 12 feet to 7 feet, to face light N.E. In this it is my desire to make various studies, full-length figures, small groupings, &c. I shall use a 15×12 studio camera, and all sizes of plates down to quarter-plate, and wish for your esteemed advice in choice of lens or lenses for the purpose under above conditions."—The studio is small for the class of work to be done in it. To do all, several lenses will be required. The most useful will be one of the group or universal series of about twenty-four inches focus for the larger sizes; a portrait lens for cabinets, and one for *cartes-de-visite*.

PHOTOGRAPHING IN THE NATIONAL GALLERY.—E. B. says: "Can yon inform me whether it is possible for the public to obtain leave to photograph pictures in the National Gallery; and, if so, to whom should application be made? I refer to pictures which could be taken as they hang."—In reply: Write to the Secretary, National Gallery, Trafalgar-square. We believe permission is obtained without much difficulty.

STAINS.—ROYAL STUDIO writes: "We enclose print, and should feel obliged if you could give us the cause of the yellow spots on same. We have had about half a dozen similar. They are of a white, milky colour at first, and afterwards go yellow."—The stains are caused in the fixing solutions, either from the prints sticking together for a time, or air bubbles being allowed to stick to them.

PERISHED INDIARUBBER.—SHUTTER says: "About eighteen months ago I bought a new shutter with pneumatic release. Soon after the ball began to collapse, and now is quite flat. Unscrewing the ball does not tend to fill it, and, if forced into shape, only collapses again when the pressure is removed. The rubber is quite thick enough to keep it in shape."—Evidently the rubber has perished. Yon will have to get a new ball.

TONING DIFFICULTY.—P. F. L. S. writes: "I shall be much obliged if you will tell me the canse of the enclosed prints toning to such a nasty colour in their half-tones. They are on Eastman's Solio paper, which has been in stock only a few days, and has been carefully kept in a tin box. The toning bath used was given by Eastman."—The toning bath is clearly ont of order. Better make a new one and keep it a day or two before using it.

TONING.—HYPO asks: "Will you kindly tell me what is the cause of the P.O.P. prints going a muddy colour? We tone 100, and two or three go muddy and a few go pinky. We use the Ilford paper. We use hard water, not distilled. Is that the cause of it?"—As only two or three out of 100 toned in the same bath are unsatisfactory, it is clear that the manipulation is at fault. The two prints enclosed are decidedly over-toned, the only fault with them.

PRICE-LISTS.—RAE writes as under: "I am abont to issue a twelve-page catalogue of enlargements, specialities, &c., and, having been troubled before by other people copying my prices, in fact, issuing a facsimile price-list, altering name and address only, I should be glad if you will tell me in your next issue if I can copyright a new one at Stationers' Hall?"—Prices cannot be made copyright, so that others cannot charge the same; therefore it would be of no use registering the new catalogne.

CRACKED FILMS.—JAS. PATERSON says: "Can you tell me any reason for the cracking of the film on the enclosed plate? The collodion is Mawson's, six weeks iodised, and the albumen substratum is very strong. I snspect the varnish, and would be glad of a remedy if you can oblige me."—It looks very much as if the varnish had been the canse of the trouble, or it may be the substratum, if that were too thick. We should advise the trial of another brand of varnish and a thinner substratum, or none at all. By abandoning the substratum the varnish has the chance of penetrating to the glass, and, as it were, binding to it.

TRAIN IN MOTION.—ARTHUR R. REILLY. "Allow me to ask you the following questions. What stop, lens, light, plate (how many times wet) would I require to take a train running twelve miles an hour? What would be the exposure?"—Before answering such a question as this, we should reqnire to know the sensitiveness of the wet plate. Wet plates, according to the state of the bath, collodion, &c., vary greatly in their sensibility. However, it may be roughly stated that, to take an object sharp, broadside on, moving at twelve miles an hour, the exposure must be about the three-hundredth of a second, supposing the object to be fifty or sixty feet from the camera. From this may be judged the plate and aperture of the lens to use.

ELEMENTARY BOOKS.—"WANT TO LEARN" says: "I should be much obliged if you would advise me as to what books (elementary) I ought to get on the following subjects: Light, Optics, and Photographic Chemistry. I have advanced books on the above subjects, but find they are too technical for me to understand at present, as I am entirely ignorant of the subjects, and am much puzzled by the mysterious signs, symbols, &c., which are not explained. As I take an interest in these subjects, and should like to study them, I should feel much obliged for your advice."—In reply: *Light*, by Sir H. Trueman Wood; *Photographic Lenses*, by J. A. Hodges; *Materia Photographica*, by C. J. Leaper. Your photographic dealer will procure them for you.

RESIDUES.—RESIDUE asks: "Would you kindly answer the following questions:—1. Have the ashes from either gelatino-chloride, 'or sensitised papers on a nitrate bath,' to be treated in any way before putting into the furnace to run down the silver? 2. The best way to recover the silver from an old sensitising bath, so as to run down in the furnace? 3. I presume chloride of silver will melt in the furnace? 4. Could you give me the name of any book that would help me on the above subject?"—1 and 3. The residues will require flux. This is equal parts of the carbonates of soda and of potash; one and a half parts of the mixtnre to one part of the residne. 2. Add common salt, and the silver will be precipitated as chloride. 4. No. Plenty on the snbject will be found in back volumes of the JOURNAL.

LIGHTING OF PORTRAITS.—CADE. Several of the portraits would be better if they had had less front and top light; they would have had greater rotundity, which they lack, particularly the profiles. The studio is an unsuitable one.

PRIZES, MAGNESIUM LAMP, LUNAR PHOTOGRAPH, STOPS.—F. KING says: "May I ask you to kindly answer the following? 1. Do Messrs. Faulkner intend giving prizes annually for photographs? 2. A description of the modern magnesium wire or ribbon-burning apparatus, without clockwork? 3. How may a picture of the moon be taken with an ordinary telescope? 4. What is the difference between the ordinary and the universal system of stop-marking? Will a stop one-eighth of the principal focus be *f*·8 by the universal system?"—In reply: 1. We do not know. Better write the firm. 2. There are several forms. Better call at a dealer's and see the different sorts. 3. Fit a camera on the eyepiece end of the instrument, and mount it with the usual clockwork arrangement to follow the motion. 4. Yes.

BUILDING LAW.—STUDIO writes: "There are two honses together; we occupy one of them, and we have a large garden each, which are thirty-six feet from front of house. Our garden is 36 × 29 feet, which gives me ample room for a studio 24 × 16 feet. 1. Can any one prevent me from building one? 2. Shall I have to pay anything? 3. Is there any particular way or means of building it so as I shall not have to pay anything? 4. If I build it with wheels on, could the City Council object? The garden is walled and palisades all round, and it would not interfere with any one."—In reply: 1. Impossible to answer the question, as we do not know the bylaws of the particular city. Each town makes its own. 2 and 3. If it is not against the law, no, except, perhaps, a fee to the local surveyor. 4. We imagine that building the studio on wheels will make no difference—as regards the City Council.

ACETYLENE.—Referring to Mr. G. H. Rodwell's communication recently, and replying for other correspondents, we may say that Mr. Banks and Mr. Rodwell are practically correct in their estimate of the volume of acetylene gas obtainable from one pound of calcium carbide. We have repeated the calculations hurriedly made in replying to E. W. B. the previous week, and find that, owing to the misplacement of the decimal point in the figures in a table of specific gravities to which we referred, we arrived at a very much higher result than the correct one. On going over our calculations again, however, and taking the specific gravity of acetylene as 0·92, with air as unity, the volume of the gas theoretically obtainable from one pound of the carbide lies between the figures given by Mr. Banks and Mr. Rodwell, and, allowing for impurities, the former is, no doubt, practically correct.

INTENSIFYING PROCESS.—B. F. G. asks if the bromide-of-copper intensifier is considered a good process for intensifying gelatine negatives, as he has tried it on some that were extremely thin, and altogether failed, as it "seems to intensify the shadows more than the rest of the picture."—In reply: That method of intensification, we should say, is eminently unsuited for use with gelatine plates of any kind, but more especially for half-tone subjects. The amount of density it gives is far too great for any but black-and-white or process negatives, while the difficulty of removing the last trace of the copper solution from the film previous to the application of the silver solution, and subsequently the removal of the latter, militate much against its use if it were otherwise allowable. But most probably our correspondent's chief canse of failure lies in imperfect removal of the hypo from the film before bleaching, for, even with a collodion plate fixed in hypo, it is in the last degree difficult to sufficiently get rid of the latter salt.

COLLODIO-CHLORIDE FOR TRANSPARENCIES.—W. HODSON writes: "I have made some collodio-chloride emulsion by a formula that I used to succeed with very well some years ago for small portrait work, but I now want to use it for transparencies. When employed for this purpose, although it gives a rich, vigorous image, I find great difficulty both in getting a coating free from irregularities and also in keeping the film on the plate. The film, when dried by heat, appears at first perfectly uniform, but soon becomes studded over with crystals and markings, many of which show badly in the finished picture. Can you suggest any means of avoiding this, and can you say if it would be of any use to employ a substratum of any kind to prevent the film slipping, and, if so, what? It seems to me that this would he a ready way of making reversed negatives by the nitric-acid process if the physical difficulties could be overcome."—In reply: A series of articles will be found in our volume for 1891 on *Collodio-chloride for Transparencies*, in which the difficulties mentioned are dealt with; but, if our correspondent cannot refer to those articles, we may say briefly that the irregularities are due to the large proportion of soluble and crystallisable matter contained in the emulsion, which, in the case of paper prints, are absorbed by the paper; but, when glass is used, as they cannot sink into the support, they crystallise in and on the film, producing the result complained of. To obtain the best results on glass a special emulsion should be used; but, even with an ordiuary emulsion, the defects may be greatly ameliorated, or almost annihilated, by using a snbstratum of gelatine, rendered partially insoluble with chrome alum. This forms a porous layer, into which the salts are in great measure absorbed, as in the case of paper, while, at the same time, it helps to hold the collodion film on the glass. With regard to the adaptation of the "print-out" emulsion to the nitric-acid reversal process, we fear you will not find it answer, for the reason that the image formed by the direct action of light is not soluble in nitric acid, and is therefore not removable by that means in the same way as a developed image.

THE BRITISH

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EX CATHEDRÂ.

Very many of our readers, we are sure, will learn with regret that Mr. W. H. Harrison, who for about a quarter of a century was a valued contributor to these pages, has been stricken down with paralysis of the brain, and is thus rendered unable to follow any occupation.

* * *

An appeal on his behalf is made by Messrs. Andrew Pringle and F. H. Varley, whose letter we published last week. Mr. Harrison's best years and energies have been spent in the study of photography, in the journalism of which he has ever taken a part as prominent as it was honourable, and we hope that a prompt response will be given to the appeal that has been made on his behalf. Mr. F. H. Varley, 82 Newington Green-road, Highbury, will receive subscriptions, or they may be forwarded to us.

* * *

The Corporation of Glasgow have determined to inaugurate the new Camphill Gallery with a Photographic Exhibition. The undertaking will be carried out by the Museum and Galleries Committee, aided by a Consulting Committee, which is in process of formation. The Exhibition will be held from the early part of June till the end of September, and will comprise:—(1) Illustrations of the History of Photography: Early Daguerrotypes, Calotypes, &c. (2) Photographic Instruments, Materials, and Appliances, Lenses, Cameras, Chemicals, &c. (3) Illustrations of Modern Processes in Photography. (4) Applications of Photography: Portraiture, landscape photographs, architecture; reproductions of pictures, drawings, etchings, and engravings; photo-lithographs, photogravures, phototypy, photo-block-printing; colour photography; Röntgen's photographs; copying plans, maps, mechanical drawings; illustration of books; lantern slides; decoration of glass, pottery, vitrified enamels, &c.; astronomy, meteorology, microscopy, spectroscopy, &c.

* * *

The preliminary prospectus states that the object of the Exhibition is to illustrate the history and development of photography, and to show the numerous and important applications of the art to science, art, and industry. The elements of competition and trade will not enter into the Exhibition, nor will there be any prize offered to exhibitors. Portraits will be shown only in so far as they may serve to illustrate the various methods of portrait photography, or special features of size, treatment, artistic excellence, &c. Landscapes may be accepted on account of the interest of the subject, as well as for technical excellence. Reproductions of art objects will be received both as illustrations of processes and for the artistic interest and importance they possess. No charge will be made to contributors. Communications respecting the business of the Exhibition are to be addressed to the Secretary, at the Corporation Galleries of Art, 270, Sauchiehall-street, Glasgow.

* * *

Messrs. Thomas Illingworth & Co., the well-known photographic printers and enlargers, of Willesden, inform us that they have opened west-end showrooms at 5, Soho-street, Oxford-street, W., where they intend keeping the latest novelties suitable for photographers, and a display of enlargements, &c. The central position of the new showrooms will, no doubt, prove a convenience to the firm's London clients.

* * *

Mr. Hugh Clements, of 61, Barry-road, S.E., has been good enough to forward us a copy of his weather predictions for the month of March. The subject is one to which he has devoted

special study, and last year he began the publication of a monthly journal called *The Clerk of the Weather*, the predictions in which, we noted at the time, were signally accurate. We append Mr. Clements' March predictions; they apply to the London district only.

* * *

"My predictions," says Mr. Clements, "so far this year have been correct in almost every detail. *Rainfall:* There will be under the average rainfall, and, on the whole, March will be a fine and rather dry month. The most unsettled part will be from the 6th to the 14th. There will be also some slight unsettlement at the commencement of the month, the 20th, 22nd, and 29th, the weather being generally fair from 15th to 31st, and from 2nd to 6th. *Temperature:* Generally the first half of the month will be milder and the latter half colder. The milder days will occur on 1st, 6th to 11th, and from 21st to 24th, and the colder days will be from 2nd to 5th, 14th to 20th, 25th to 27th, and 29th to 31st. The minimum temperature will scarcely go below 25°, nor appreciably exceed 40°, while the maximum temperature will probably seldom exceed 55° nor descend under 35°. *Winds:* There will be strong winds, storms, or gales round our coast on or about the 3rd, 7th or 8th, 11th to 13th, and from 21st to 24th. *Air-pressure:* The barometer will be higher on or about the 4th, 7th or 8th, 10th or 11th, 16th to 21st, and 30th and 31st, and lower at the beginning of the month, and on the 6th, 9th, 13th, 22nd, 25th, or 26th."

* * *

"These predictions," adds Mr. Clements, "are made for London because the metropolis is the only place in England for which I can obtain the necessary records of the past weather. Even if there were satisfactory records for other parts of England, and even places abroad, it would be impossible to give a forecast of the weather that would be correct for several places at the same time, as the weather at any given moment differs for different places, but it is possible to give correct predictions for each separate place, provided the necessary records for each of these separate places are available. The weather at any given moment differs at different parts of the earth's surface, but at that moment it is exactly the same for each different place as it was at a previous moment when the lunar cycles were exactly the same."

* * *

Messrs. George Houghton & Sons, of 89, High Holborn, W.C., are supplying the whole of the apparatus necessary for electrographic experiments, including Crookes' tubes, bichromate batteries, and Ruhmkorff induction coils.

THE RÖNTGEN RAYS.

From every part of the civilised globe, from universities, physical laboratories, public colleges, we might almost say from village schools, accounts come pouring in to the scientific and newspaper press, and to learned and other societies, till they cannot keep pace with them, of further experiments with the Röntgen rays, or other unknown invisible radiations. Though there has been an apparent tendency to show that the new rays are not new, that they are merely further manifestations of Lenard rays, the consensus of skilled opinion all goes to show that Röntgen truly deserves the title of discoverer, and that the Paris Academy were doing him justice in linking his name with the new force, whose results he had described. It is further evident that his first announcement gave lucid and exact accounts of a thoroughly reasoned-out series of logically connected experiments, which the majority of experimenters have, so far, merely repeated with variations, and verified. Images on photographic plates, films, and papers have been obtained through light-opaque screens by the radiations from Wimshurst machines, ordinary vacuum tubes excited by coils large and small, the brush from a Ruhmkorff's coil, Crookes' tubes, rendered active by Ruhmkorff's coils, with and without a Tesla coil added, and actuated by battery, electricity from the main of both high and low intensity, or from a statical machine; also without any electrical machine at all, merely by the light from a paraffin lamp, or by daylight; and, finally, and this appears almost a *reductio ad absurdum*, with no sensible radiations whatever, merely by placing a plate against a negative in total darkness. Yet evidence is slowly accumulating that Röntgen rays are unique, novel, and wonderful, hence the most important scientific aspect of the discovery is the question what are they—electricity, magnetism, light, or a new form of energy? Mr. Crookes' remarks upon Professor Röntgen's refusal to accept the hypotheses which identify the X rays with either the ultra-red, the visible, the ultra-violet rays (such as have been hitherto studied), or the Lenard rays, are as cogent as could be uttered: "Perhaps the best way to ascertain the nature of the X rays will be to work with them." There is no doubt that, owing to the great popularity of the practice of amateur photography, an immense amount of working with the rays is being done, but comparatively little of it in the manner Mr. Crookes intends.

One confusing result is found in the fact that contrary conclusions have been arrived at by different observers working at the same set of experiments. As an example, we may say that, while Röntgen and others found glass to be not very permeable to the rays, Mr. Gifford* suggests "that glass is fairly transparent to the Röntgen rays; almost as transparent as aluminium, in fact."

As to the relative transparency of substances, M. V. Chaubaud† found it mainly a question of degree. Aluminium had already been shown to be very transparent. Lead, zinc, copper, zinc amalgam, tin, steel, gold, and silver were not opaque with a thickness of ·2 mm., but platinum was, though at a thickness of ·01 mm. it was easily permeable. Mercury at a thickness of ·1 mm. was quite opaque. M. M. Meslans‡ submitted proofs to the Academy referring to about fifty substances from which he was able to draw certain general conclusions. The organic substances, ethers, acids, and nitrogenous substances were easily traversed; but the introduction into the organic molecule of a mineral element, iodine, chlorine, fluorine, phosphorus, &c., gives to the molecule a great opacity. The opacity of bones is due to their mineral constituents. At present, indeed, the relative transparency and opacity just alluded to seems to him to be established as a general law. MM. Launelongue & Oudin§ claim to be the first who have taken negatives of the thigh and knee. Professor Wertheimer‖ finds bones not wholly opaque, and describes an experiment in which a needle on the under portion of the distal end of the first phalanx of the great toe gave a distinct sciograph, thus showing the bone to be partially transparent.

* Quoted in *Nature*, vol. liii. p. 380.
† *Comptes Rendus*, cxii. p. 237. ‡ *Ibid.*, p. 309.
§ *Ibid.*, p. 283. ‖ Quoted in *Nature*, vol. liii. p. 379.

With regard to the sensitiveness of the plate and its influence, M. Albert Londe* finds the impression much more energetic on rapid plates, and that, in fact, the strength of the image was in exact proportion to the sensitiveness of the preparation.

We have already alluded to M. Gustav Le Bon's results with ordinary light. While M. Albert Nodon† exposed a plate behind several thicknesses of black paper for fifteen minutes, at a distance of ·4 metre, to an arc light of twenty ampères, and obtained no effect, the former experimenter, placing a negative on a plate, and over all a sheet of iron, and exposed to a lighted petroleum lamp for three hours, obtained a faint image, and a very decided and strong image when he enclosed the whole with a sheet of lead overlapping the iron at the edges. But others have failed, and M. G. H. Nievenglowski‡ repeated Le Bon's experiments in the dark without any source of light, yet obtained results similar to M. Le Bon's. In the current number of *La Nature*, giving details of the last sittings of the Academy, M. d'Arsonval confirms the latter *savant's* results, and exhibited superb results obtained by M. Henri Murat, of Havre, who, through a sheet of copper, obtained, by the light of an incandescent gas, a negative of the bony part of a skate, showing the fins, liver, and heart.

The most recent addition to the theoretical aspect of the discovery is that of MM. Gossart and Chevalier, who, to speak briefly, find that the Röntgen rays appear to extinguish heat effects. Thus, placing a Crookes' radiometer in their path, the experimenters found the vanes set in motion by external heat agency were stopped dead by the Röntgen rays. A field of force was created in the radiometer, and exercised its restrictive action upon the vanes for five minutes after the withdrawal of the Crookes' tube.

Mr. Watmough Webster has suggested to us a little while ago the possibility of increased photographic action being obtained by the sheets covered with fluorescent substances being placed in contact with the gelatino-bromide films, and thus reinforcing the action of the rays, and has further suggested that the Röntgen shadows be received on such a fluorescent surface, the visible image thus available to be photographed by an ordinary camera and lens.

Finally, we must advert to the latest development of the Röntgen radiation. We have referred to an obscure announcement, received with a certain amount of incredulity, that an Italian, Professor Salvioni, had invented an instrument, called an iristoscope, for seeing, instead of photographing, through opaque bodies. Working on the lines of Professor Salvioni's description, Messrs. Swinton & Stanton have devised an apparatus for the same purpose, and, writing to *Nature* last week,§ they give an account of their success. The Röntgen shadows are thrown on to a platino-cyanide of barium fluorescent screen, placed barium side inwards at the end of a blackened cardboard tube. Upon looking into the tube, objects were clearly seen, and beyond that, by a further adaptation of the method, they were easily able to ascertain which was the best part of the Crookes' tube from which to obtain the Röntgen rays.

The subject is now so wide that it is difficult to summarise its evolutions in a single article, but our readers may be sure that all important developments will be duly recorded in these pages.

* *Comptes Rendus*, p. 311. † *Comptes Rendus*, p. 237.

‡ *Comptes Rendus*, p. 232. § P. 388.

The Picture Market.—We have occasionally referred to the extraordinarily high prices sometimes realised at auction sales for paintings by the old masters. As showing the fluctuations of the picture market we quote some of the best prices obtained by Messrs. Christie & Manson on Saturday last. *Meditation*, by Sir Joshua Reynolds, brought but 460 guineas, a Cuyp but 380 guineas, a Van de Velde 240 guineas, a Cosway 200 guineas, a Van Eyke 300 guineas, another Sir Joshua 220 guineas; *Cattle Reposing*, by Paul Potter, only fetched 110 guineas, a pair of paintings by Sir Thomas Laurence only brought 120 guineas, and another by the same artist but 105 guineas. *A Fête Champêtre*, by N. Jancret, which was exhibited in Manchester in 1857, however, was sold for 800 guineas. It is noteworthy also that a large proportion of the pictures in this sale were portraits; still, by such masters, much better prices would have been expected.

The Composition of Green Fog.—It is usually supposed that green or dichroic fog is confined to gelatine plates, and it is said to be the result of a combination between the gelatine, bromide of silver, and pyro, of the nature of a dye. But it is quite easy to obtain it in the most pronounced form upon collodion films under circumstances that entirely preclude the possibility of either gelatine or bromine forming part of its composition. It is usually also supposed to require the use of pyro and ammonia, though we have had it both with soda and with metol on gelatine films, and with metol on collodion. It is only with a very excessive dose of ammonia that we have succeeded in producing it upon collodion films in ordinary development, and under those circumstances it has appeared both with pyro and metol. But it is very easy to get it in the most intense form. We have even seen it in the following form. Let a collodion plate be fixed with hypo, and, after a fair amount of washing, immerse it for a short time in dilute solution of iodine. Then, in daylight, proceed to intensify with pyro and silver. The action will proceed quite normally for a time, the first departure from the proper course being the usual discolouration of the shadows. This goes from yellow to pink and ruby by transmitted light, and finally the green colouration by reflected light comes with an intensity that is seldom seen with gelatine. Here, although we have neither bromine nor gelatine present, we have pyro, organic matter, and the possibility of free halogen in the form of iodine, so that probably the original idea of its composition is not far wrong.

A Process Revealed in a Vision.—Many photographic processes, especially some of those which profess to solve the problem of photography in the colours of nature, may be described as visionary, but, so far as we can ascertain, only one person has ever declared that a process was revealed to him in a vision. An account of the episode will be found in the life of that erratic genius, William Blake, and, although the process in question is not a photographic one, it deals with a subject now nearly akin to photography, namely, the quick production of a printing block. It is not too much to say, perhaps, that in it we have the germ of the common zinco linework block. William Blake, even in his boyhood saw visions, and his persistence in his statement that he had seen angels on Peckham Rye greatly angered his good father. But the visitation to which we now more particularly refer occurred in his later life, soon after he had lost a younger brother to whom he was devotedly attached. He was at the time anxious to publish an illustrated book called the *Songs of Innocence*, but he was very poor and had no patron to befriend him. At this juncture the spirit of his dead brother appeared to him in a dream, and told him how the work could be done without the help of an engraver, and so impressed was he with the reality of his visitation that the next morning he spent his last half-crown on copper plates with which to commence the work. Text and illustrations were drawn on the copper in resinous ink, and the plate was afterwards etched in aqua fortis, leaving the lines of the design standing up in relief. This book is unique in the history of literature, and it is now very rare; it was issued in 1787.

A Suggested Use for the "New Photography."—Photography with the help of a Crookesian tube has evidently caught

on; at least, we are constrained to think so when we hear of its suggested use by Boards of Guardians at our workhouses. Let it at once be understood that they are not going to provide apparatus at the expense of the ratepayers for the amusement and instruction of the inmates—this may come later on—but at present they aspire to employ the rays for a different purpose altogether. It seems that the Local Government Board, seeking a new outlet for its energies, has discovered a flaw in our otherwise magnificent but costly system for the relief of the poor and idle. It has found that the tramps and vagrants who present themselves at the casual wards are not questioned by the authorities as to their religious belief. This shocking state of things could not, of course, be allowed to continue for one moment longer, and a circular was immediately issued to the Guardians with reference to the omission. The Guardians of one house of free entertainment have signified their heartfelt regret at the omission, but justify themselves on the ground that the refugees who come to them for succour are generally in such an advanced stage of intoxication that it would be difficult to get from them any concise statement as to their theological opinions. It is here that the "new photography" comes in, the suggestion being that the bump of veneration in these tramps should be examined *à la Röntgen*, so that its contents may be appraised. The notion is not so quixotic as it seems, for the rays so employed would meet with a great deal of brass—and this is one of the metals which is opaque to them. An interesting picture would therefore most surely result.

Tempting a Pharmaceutical Chemist.—At an inquest on a child, held at the East End of London one day last week, the mother said she went to a chemist and obtained a mixture for him, saying the baby had a cough. On this the Coroner is reported to have made the following extraordinary remarks:—"Do you know that is not lawful? A chemist is supposed to make up prescriptions you take to him, and not to prescribe; that is what a doctor gets his diploma for. Chemists are cheating the doctors when they prescribe, and they should not do it. You tempted the chemist to break the law." One might have surmised that, instead of the mother being reprimanded for tempting the chemist and druggist to break the law, the latter would have been censured, if not prosecuted, for breaking it. If the medical societies were to put their laws in force against phamaceutists as their Society persecutes photographic dealers and others, it would make a material effect on the returna of the majority of them, and probably many valuable lives wonld be saved annually.

A LITTLE while ago the Pharmaceutical Society recovered their penalty, of five pounds, from a well-known firm of oilmen for selling fly papers. The iniquitous administration of the Pharmacy Act was dwelt upon by the defendant's counsel, but the Judge, who evidently had little sympathy with the prosecution, said he did not make the law, he had only to administer it as he found it. Notice of appeal was reported to have been given. If oilmen, photographic dealers, drysalters, and others interested were to combine and agitate the matter, there is little doubt that the Pharmacy Act would quickly be modified, as well as the vexatious way it is administered by what is really a trade society and nothing else.

Are Orthochromatised Plates Myths?—This, in the year 1896, would appear to be an absurd question, were it not for the fact that it was stated at a recent meeting of the Croydon Camera Club, by Mr. White, that ordinary plates will, providing a full exposure be given, yield results in colour-rendering not inferior to those on orthochromatic ones. Naturally this statement was received *cum grano salis* by some workers, and was challenged by one gentleman. The challenge, however, the President of the Club writes, he would advise Mr. White to let severely alone. As a reason for this, he says he thinks it would be difficult to find an "independent and competent body" to decide the question, "for unfortunately, in the upper circles of photographic societies, there exists a most perverse objection to giving ear to the conclusions of practical workers." (?) He adds that "it has been one of the most notable curses of photographic advancement, that for years the road has been barricaded by the *débris* of laboratory twaddle, and the rubbish of text-books."

HOWEVER, the President of the Croydon Camera Club promises, in the event of Mr. White deciding not to meet this challenger, that he "will try and arrange for the publication, in one of the technical journals, of a paper, setting forth with more precision and fulness than is possible in a mere abstract, how Mr. White seeks to substantiate his case." We are sure there are a very large number of practical workers, with a decade or two's experience in the reproduction of paintings, both at home and abroad, who will look forward to the publication of this paper, and hope it will not be long delayed.

Vandalism at Hampstead Heath.—Hampstead Heath and its surroundings have always been a happy hunting ground for landscape painters, and many of their best works have been of that neighbourhood, notably some of those of Constable. Curiously enough, Hampstead Heath, and its beauties, seems to be but little known to London photographers. At one of the annual outdoor gatherings of the Photographic Club were several photographers, who had spent the greater part of their lives in the metropolis, who had never been to the Heath before; they seemed to have, as others have, associated the Heath only with "'Arry and 'Arriet" at "'Appy 'Ampstead" on bank holidays. Now the Heath is under the control of the London County Council, and its picturesqueness appears to be doomed. As most are aware, that body's idea of beauty is straight and smooth gravel walks, level greenswards, and neatly trimmed trees, and that idea is being carried out on Hampstead Heath, much to the disgust of artists and lovers of natural beauty generally.

A PETITION is to be presented against this vandalism. It is as follows:—"We, the undersigned artists and other admirers of the wild and picturesque beauty of Hampstead Heath, do most urgently petition the London County Council to put an *immediate and final stop* to some of the work now proceeding there, namely, the cutting and burning of the old gorse bushes, the filling of hollows in paths with sand taken from banks and knolls, the drying up of small ponds by throwing in ashes, mud," &c. Then follow the names of the petitioners, which include the President of the Royal Academy, the Vice-President of the Royal Water Colour Society, the President of the Royal Institute of Painters in Water Colours, some R.A.'s, literary men, civil engineers, &c. What effect, if any, this petition will have on the London County Council and its notion of the beautiful remains to be seen.

Reversed Negatives.—A week or two ago a correspondent made reference to the possible use of collodio-chloride emulsion for the reproduction of negatives by what is known as the nitric-acid process, in which, without fixing the plate, the image first formed is dissolved out by means of nitric acid, leaving the unreduced haloids to be darkened by alkaline pyro or other suitable development. Such, at least, is the mode of procedure when the image has been formed by development, the reduced silver being entirely soluble in nitric acid and other agents; but when it is formed by the continued action of light, or, as it is termed, by "printing out," its constitution is altogether different, and, although nitric acid has some action upon it, it entirely fails to remove it. It is not necessary here to discuss the much-vexed question as to the nature of the image under such circumstances, or whether the undissolved portion consists of subchloride of silver or what; the plain fact remains that it is practically insoluble, and thus collodio-chloride is altogether useless for the purpose of producing reversed negatives, at least when employed in the direct manner.

BUT we have seen very fair results obtained with a printing-out emulsion, though in a somewhat roundabout manner, and, though the process requires some care, it does not present any particularly serious difficulty. The printing is carried much further than would

be needful if an ordinary transparency from the negative were required. The plate is then washed, to free it from all soluble matter, and is then immersed for some time in a not too strong solution of iodide of potassium until the unreduced silver chloride is converted into silver iodide. It is next thoroughly washed and treated with a solution of bichromate of potash, to which a little hydrochloric acid has been added, by which means the image is bleached and converted into chloride of silver. We now have an image of silver chloride embedded in a layer of silver iodide, and, by taking advantage of the difference in solubility of the two haloids, the chloride can be removed without any great effect being produced on the iodide, which is then reduced in its turn to form a reversed image.

For the removal of the bleached image, a saturated solution of common salt, or a mixture of that with strong liquid ammonia—neither of which have much, if any, action on iodide of silver, though they freely dissolve the chloride—may be used. Very weak hypo or sulphite of soda will dissolve the chloride much more rapidly than the iodide, but such applications are difficult in use, owing to their solvent power on the iodide also and the consequent danger of unequal action; the first-named agents, though less energetic, are therefore preferable. The reversed image in iodide of silver requires for its reduction a very powerful alkaline developer, consisting of pyro and caustic potash, or it is possible, if the plate be soaked for some time in bichromate of potash or chromic acid, and thoroughly washed, it might be developed in the same manner as a wet plate by flowing it over with a solution of silver nitrate and, after a brief exposure to light, applying a solution of acid, pyro, or iron. The difficulties of the process are purely of a manipulative character.

DIGRESSIONS.

III.—Portraiture.

It was an Irish student, I think, who said there are three degrees of existence; you may live, or die, or vegetate. Portraiture has been vegetating for many years, and the time is coming when it will cease to occupy the neutral position, but must live or die. Monotony of splendid mediocrity can no further go. Everybody capable of rising has risen to a certain highly polished mechanical level; the residuum is left to make photograms. Take up any album of photographic portraits anywhere and, with few exceptions, it will be found full of precisely the same kind of work, it matters not from whose hand, or whose assistant's hand, or what part of the country. A glance backwards will show that we pass through waves of fashion in our art as in everything else. We are now in the show-case age of photographic portraiture and, let us hope, we are nearing the end of it—we have had it for ten or twelve years. Before that time, although not so good as has occasionally been shown to be possible, portraiture was sound and unaffected; now it is in the last degree puerile and trivial. It is "pretty." If there was a more contemptible word in the dictionary, I would use it.

There is this about this present series of papers above all others: it is a merit to digress, because the intention is to digress, and fulfilled intention is art. Therefore we will go back a few hundred years.

In painter's portraiture there have been many stages or periods in which the art appears to have been governed by fashion, yet the fashion has mostly been set by a master hand. The simplest student recognises the ages of Holbein and Vandyck, those of Lely and Kneller, helped, of course, by costume. These were followed by an era of minor but very prolific stars, some of them, indeed, were thought by their contemporaries to be the greatest geniuses of any age, but we of the present time have forgotten them. Poets of their own time perhaps exaggerated a little. One of them prophesies of a painter, now quite unknown, —

> "That future ages must confess they owe
> To Streater more than Michel Angelo."

(This following is an aside. What can painters expect when photographers are so easily forgotten? Only the other day a group of photographers in their best clothes, evidently attending some ceremony, was reproduced in a contemporary with a request by the editor for the identification of those represented, alive or dead. This is the only time I have been the object of a hue and cry, for I was one of them. Four of the other five figures are dead, but were, perhaps, the four best-known photographers of thirty years ago.)

Then came the splendid age of Reynolds and Gainsborough, and their famous contemporaries, which declined into the sweetness of Lawrence, who certainly succeeded in making ladies and gentlemen of his sitters, and the country was flooded by his imitators, who created the worst period of English portraiture, which lasted until photography taught painters what bad work they were doing, for which they have never been grateful.

A digression. I remember the bad time. In 1852 (that long time ago) I had my first picture in the Royal Academy Exhibition, and, of course, got the usual season ticket. I was so proud of having a picture in, that I visited the Gallery at every opportunity, and knew nearly every picture of that show by heart. And this is what I remember. Nearly every portrait had a cut orange and a silver inkstand, with a very large quill pen on the table, and a column and curtain background. Now, seeing that this background was authorised by every painter, is it wonderful that every photographer, in some cases against his own conviction, set up a column and curtain? The absurdity taught painters to think, and from that time, aided also by many other hints we have given them, portrait painting began to improve, and now some of our portrait painters give us work, perhaps with a little sameness of pose compared with the work of a good photographer, but equal to anything that has ever been done. It is now time we showed them how to carry the art a little further.

A personal digression. Many a doubting R.A. has consulted the old catalogue to see if it was true that a photographer could not only paint a picture, but get it into their show—a feat they found it difficult to believe. Rejlander also accomplished the same apparent impossibility.

We are now, I firmly believe, on the threshold of better things. The *Salon* is doing its work, and the public are at last becoming educated. Unfortunately, some of those connected with photography will have to suffer, but it will be only those who do indifferent work and cannot advance with the times. Photographers will have to be artists, not merely manufacturers or employers of labourers, and prices will correspond. There will still be room for poor work, but not for mediocrity. The cheap-and-nasty always flourishes. 'Arry and 'Arriet will still sit for their tintypes and "photograms" on the shore, but we shall return to pure photography, and the results, within the bounds of cultured civilisation, will be unboomed photography. In those days a photographer will be a photographer, and not a strange mixture of all sorts of trades and professions.

If portraiture is to recover its place as a profession, we must give up a good deal of the namby-pamby stuff of which every show-case is full. We shall have to give up retouching as it is now carried on. Ignorant "dotters" must not be allowed to spoil their eyes by sitting for hours smoothing, and taking the life out of, a single head, and must not suffer the simple revision of a negative to be turned into an exhibition of machinery in motion. It should be a Medo-Persic law that no man be permitted to give more time to a two-inch head than ten minutes, but then he must be a master of his art; so must be the photographer. Every extra minute spent on a head of this size does mischief. Of course there are exceptions to all rules, and an excessively freckled face may take longer.

Those of my readers who have any self-respect, have any desire for something pleasant to think of all their lives, and could manage it, of course saw the three exhibitions of the *Salon*, and, doubtless, remember the portraiture; and many, doubtless, also have tried to follow such excellent and apparently simple examples, and yet once more, doubtless, have been surprised to find how exceedingly difficult these apparently easy effects are to get. A casual visitor would have thought that in each case the sitter had just walked into the studio, that the exposure had been made, as you would let off a hand camera when you were flush of plates, any how, and there an end. This is the art that hides the art; you try that way yourself and fail. The

difference in the two cases was this. You allowed the sitter to be "so natural" all to himself while you were probably thinking of the number of seconds the particular quality of light would require; in the other case the sitter did as the artist wished unconsciously, looked as he mentally directed, smiled or frowned at his will, these emotions not being brought out at the word of command "your expression or your life," as sometimes happens, but *educed* with apparent carelessness, but really great pains and previous study. Just as the doctor when considering whether anything can save you looks pleasant, so does the photographer when he is bringing up his reserve powers. This is the photographer's substitute for what the painter calls treatment. The true artist takes the portrait long before he takes to the camera. The instrument is merely a detail. The sitter should be conquered long before it comes to that.

I wonder if America will think it a compliment if we go there for inspiration and perchance annex a hint. The novelty may have its pleasing aspect.

I always enjoy the *Photo Beacon*, although I do wish its title was not clipped. It is not a light beacon, as its name implies; its editor, I know, thinks it has more to do with photography than light-houses.

Looking through the number for last November, I came across a portrait that almost made me jump, it was so lifelike. It was not another portrait of that familiar young person, Aristo, or of the highly polished Ilo, it was a portrait of a man—the simplest thing possible. Full face, looking straight at you. Just the pose that it is the first rule of some portraitists to avoid. No attitudinising, no gush, no best clothes, no violent effect of light, not even out of focus; and, oh, rare quality! nothing about it of which an advertisement could be made (good work has beaten quack nomenclature). The sitter is not picturesque, but—*he is alive!* What is the secret of this effect?

This, and other pictures, are by Mr. W. M. Hollinger, of Dayton, Ohio, and we are told he exhibited, for the first time, at the last American Convention. The portrait in the *Photo Beacon* is accompanied by a few words, by Mr. H. F. Hoefle, with which we shall make free.

The colour values, the wonderful gradations, and, above all, the remarkable rendering of flesh, appeared to attract great interest to these pictures, and, what the ordinary portraitist will scarcely believe, the effect is produced almost entirely without retouching. Says Mr. Hoefle: "The flesh texture is easily got. Mr. Hollinger recognises that photography is emphatically the most perfect method of rendering texture of any kind the world has seen, and, believing this to be the case, has no hesitation in sending out much of his work absolutely free from the contamination of the retoucher's pencil, and where its use is absolutely necessary to remedy defects is as sparing with it as possible." He holds that every stroke of the pencil detracts so much from the quality of his work.

It may not be uninteresting to learn something of Mr. Hollinger's method.

"His studio side light is twelve feet by sixteen; the top light, which is at an angle of 30°, is twelve feet by fourteen. The glass is corrugated. Mr. Hollinger has entirely discarded the ordinary curtains, and depends for securing his effects upon a screen, which is placed between the sitter and the source of light. On this screen are a large number of little curtains, and, by drawing any one of them, he can let a flood of light in upon the sitter."

The screen described is a large frame of wood like a background frame, on which are arranged ten or a dozen curtains of a rather light, perhaps blue, material. This frame is placed near the sitter, and some of the curtains drawn, one at a time, until the effect of light and shade required appears. The high lights in this particular picture are strong, the flesh full of texture; there is not a bit of waxwork or ivory anywhere, the natural wrinkles are there without being aggressive, the light spots on the eyes are small and most effective, and, we are told, are the natural effect, and not due to the retoucher's pencil. Another delicacy is a rightly placed gradation in the background, which gives great relief to the head. Here we have a portrait that does not at first sight differ very much from the ordinary cabinet portrait, yet is so much above the usual production as to be distinctly individualistic, and almost to amount to a new style.

Here I see a rock ahead. I am not sure I am discreet in mentioning the screen of many curtains. Photographers are so easily led away by anything mechanical. When Adam Salomon sent some of his wonderful portraits to London (it is an old story), they were admired and studied with the greatest enthusiasm by many of our portraitists, who came from all parts of the country to see them. What was the result of all this enthusiasm and study? They all, with one accord, set to work to discover the secret of a kind of wax with which the famous photographer finished the surface of his prints. They found it. Astonishing to say, notwithstanding the great discovery, none of them got such good portraits as did Adam Salomon, but they got as good a polish!

Now, I don't want that screen of curtains to be mistaken for the secret of the almost boisterous life to be seen in this portrait. The real secret is clear. It is a perfect knowledge of what is best to be done and how to do it. How to do it is very easy; but it takes very earnest study to learn what is best to be done. Some of us don't know yet.

H. P. Robinson.

BY THE WAY.

It is scarcely possible to take up the pen to discourse on general photographic topics without making some reference to *the* subject of the hour—the "new photography," "shadowgraphy," "electrography," "sciography," or whatever it may please individual readers to call it; but, since I referred to the subject in my last notes, I have become so sick of it that I would fain have passed it over unnoticed on this occasion. I said last month that the impressions so produced are certainly not photographs, and I do not know which of the other terms enumerated above is the most detestable. Until it is decided under what head the mysterious X rays are to be classed, I would suggest that the pictures (?) produced by their means be called "Röntgeographs," as being at least as full of meaning, and at the same time doing honour to the discoverer.

It is never wise to prophesy unless you know, and in my last notes I referred to or hinted at the difficulties that lay in the way of experimentalists in this direction, and I imagined the new branch of research would remain in few hands; but, alas! for my judgment, in one short month every photographic society, from that of Little Peddlington downwards, to say nothing of other bodies "outside the pale," has had its demonstration, and, as a rule, the more remote the scientific centre, the more humble the demonstrator, the more wonderful the results obtained. As usual, it is in the "lay" press that we read of the most surprising variations from the original story; but I am not certain in my own mind whether to give credit to the inventive powers of the ordinary pressman or simply to "sheer cussedness" on the part of the great improver-of-other-people's-ideas for the statement that Edison is going to "Röntgeograph" his own or somebody else's brain. We are told on all sides that it is only the bony structure that is opaque to these "rays," while the softer and flabbier the tissue the more transparent it is; yet the "great improver," &c., is going to reverse matters and make the skull transparent and the brain opaque. An idea, however, strikes me. Professor Röntgen himself suggests that density more than anything else rules the transparency of any given substance to the X rays, and perhaps it will not be a very difficult matter, after all, to find a subject whose brain is actually denser than his skull.

But the height of bathos is reached when I find from an advertisement in the daily papers that the scientifically inclined can, for half-a-crown, witness the wonderful new process, or, for another five shillings, have a "Röntgeograph" of his head, or foot, or purse, or anything that is his! Surely there will be a rush for these productions.

Another of the "sensations" of the new year, to which I alluded in my last, seems to have fallen rather flatter than Professor Röntgen's discovery. I allude to that of the other Professor—Herkomer. It would be a pity, after all the talk about it, if the "new art" should prove a "fizzle," as seems likely, or be worked only by its inventor. I have not seen any of the accredited or avowed examples, unless, as is very possible, a portrait of "Dr. Jim" in, I think, the *Review of Reviews*, by Professor Herkomer,

was rendered "diffusible" by himself. If so, how are the mighty fallen if that is the correct "autographic touch" at the present day of the painter of *The Last Muster!* It is, I think, twenty years or so since I first stood almost in awe before that great picture, and more than admired the wonderful detail and singular naturalness of those portraits, for portraits they were; but I would not have believed it possible in so short a period for a hand to so completely lose its cunning. Stay, however; it may be the fault of the new process—art, I mean—which is perhaps, after all, not so free from the difficulties and uncertainties of "rocking" and "biting" as its inventor at one time believed. Perhaps the battery went out of order, perhaps the ink wasn't stieky enough, or the powder mixed in the proper proportions of coarse or fine, perhaps—ah, well!—perhaps a hundred things.

Speaking of Professor Herkomer's innovation leads me almost irresistibly to another new form of reproduction, of which at the present time Mr. Alfred Maskell is the champion. I allude to the system of carbon printing without transfer, whether by the Artigue, Demachy, or any other plan. There is, though, after all, nothing particularly new about it, since it was really the original method, and was only departed from when the transfer method or development from the back was found to give better results. As recently pointed out in these pages, such a process was commercially worked in America some ten years ago, but long before that, I think it was, the late Mr. Pouncy showed me some really very fair specimens of so-called "carbon" work executed without transfer, though I am ignorant of the details of the process, and long even before that I had read of the possibility of such results.

But Pouncy's process, as well as that described by Mr. W. H. Sherman, were intended for very different purposes from those to which Mr. Maskell and the more modern disciples of carbon printing without transfer apply it. These latter adapt the process to the ordinary every-day printing requirements, as I understand it, large or small, whereas Pouncy's and Sherman's processes were solely used for large work or enlargements. Now, any one at all acquainted with the latter class of work will readily understand how a method that may be thoroughly well suited to the purpose of supplying a groundwork upon which a finished picture in black-and-white or in colours can be built up by an artist may be just as hopelessly unadapted to the production of a finished result without such extraneous aid, just as the method and style of the scene painter would be useless in the hands of Miss La Creevy and her class. It is quite true too that the effects sought after by the new school of "pinholists" and "fuzzytypers" may be arrived at by means that would scarcely satisfy the cravings of the majority of photographers, and which would scarcely be expected to do justice to the capabilities of our modern lenses.

The process is only a means to an end, and each individual is free to select and use that which best meets his requirements, for which reason I am not in any way finding fault with the methods championed by Mr. Maskell. Where I join issue with him is in bringing a "charge of false teaching and want of knowledge of this subject against our scientific makers of text-books." That the text-books are strictly correct in teaching that a *perfect* carbon image can only be produced, so far as is present known, by development from the back, needs very little argument, and I scarcely think that any impartial critic, blest with a "judicial mind," would, on comparing the results of the two methods, hold that the Artigue process was the more perfect. That a certain sort of result is thus obtainable, suited to certain purposes, is beyond doubt, but it would be as reasonable to call it the perfect method as to hold that the best way of compounding a gelatine emulsion is to stir precipitated silver bromide into a pot of melted glue! Perhaps a pinhole negative is not improved by printing it on to surfaced paper, with the highest "bonbon-box" finish, and, *per contra*, I really don't think the definition of a modern Zeiss lens would be augmented by having recourse to the modern revival of the earliest of all carbon-printing methods.

Talking of text-books suggests a reference to a letter from Mr. Hector Maclean, at page 126, in which I find the following extraordinary piece of argument (?): "It has been one of the most notable curses of photographic advancement that of years the road had been barricaded by the *débris* of laboratory twaddle and the rubbish of text-books." It is for this, then, that Vogel, Waterhouse, Eder, Schumann, Bothamley, Abney, Ives, Tailfer, and a host of other workers in the same direction who have hitherto been supposed to be capable men and to know something of what they have written about, have spent years of wasted time—to write "twaddle," and fill the text-books with "rubbish." It is due entirely to their misguided efforts that hundreds of photographers, the world over, have for years been content to pay enhanced prices for so-called orthochromatic plates, upon the perfection or supposed perfection of which thousands of pounds, dollars, and francs, have been spent in this country, in America, and on the Continent; but, to the credit of old England, and of Croydon in particular, it is in our native land that the error has been exposed! All the same, Mr. Maclean, yours is scarcely "argument," as we understand it in this country, though it might do for the editor of the Texan or Californian *Pocket Handkerchief*.

So far as the question in dispute is concerned, there is much to be said on both sides—that is, at least, so far as the use of ordinary plates with the coloured screen is concerned; but to assert, as I take it Mr. Maclean does, that better results in colour-rendering can be obtained with ordinary than with properly colour-sensitised films is simply absurd, and is more, I fancy, than the author of the paper he attempts to defend ever dreamt of claiming. In the early days of orthochromatics I was strongly of opinion, from theoretical considerations, that *as good* results, under certain conditions, could be got with a screen on ordinary plates as upon orthochromatic—not better, be it understood, nor even as easily; but, upon putting the matter to the test of practice, I was compelled to acknowledge myself beaten. The more recent investigations of Mr. Ives and others prove that I was not altogether wrong, and, no doubt, the cause of my failure lay in the want of a suitable screen: but, even granting the possibility of arriving at colour-correct results with ordinary plates, it will stand to reason that they must be inferior—in convenience, at any rate—to films specially prepared for the purpose.

It is, perhaps, not beyond the memory of many of your present readers that, so far back as 1880 or thereabouts—in the early days of gelatine plates, at any rate—the late Mr. J. R. Sawyer read a very interesting paper before the Photographic Society, in which he showed, if I remember rightly, that the most correct rendering of the majority of colours was obtained with ordinary bromo-iodised collodion, its competitors being other kinds of collodion, as well as gelatine with and without dyes. The chart illustrating his paper was published in the Society's journal, and forms a very interesting reference at the present day.

DOGBERRY.

FOREIGN NEWS AND NOTES.

Images Due to the Oxidation of the Developer.—In the *Photographische Correspondenz*, Liesegang, continuing his researches relative to images due to the oxidation of the developer, remarks that amidol, under certain conditions, will yield such results. A negative developed with pyro and ammonia still retains a printable image after the silver has been removed with bromide of copper and hypo. If amidol be mixed with an alkali, exposure to the atmosphere or to the air contained in water will yield an intense blue product due to oxidation. Make a developer with amidol and bicarbonate of soda. In use it will take on an increasing violet colour. The negative is stained, but after fixation the deep shadows are clear, and the stain is in proportion to the deposit of silver. Treatment with bromide of copper and hypo discloses the fact of a red to red-brown image, without much reduction by removal of the silver. It would therefore seem that under such conditions the negative owes its intensity principally to stain. The wet negative shows little relief, consequently the stain does not possess much tanning property. Pyro-ammonia and alkaline amidol developers are therefore to be recommended for plucky negatives, full of detail, and for positives of warm tone.

Adolph Menzel.—On December 8 the great German painter, Adolf Menzel, completed his eightieth year, and was the recipient of

high honours. Deputations congratulated the veteran, and by imperial favour he was created Privy Councellor with title of Excellency. The Berlin Photographic Society also offered him honourary membership, which he accepted. Unlike most painters, Menzel has been a staunch friend of photography, and has known how to appreciate its value. According to the *Photographische Mittheilungen* he may claim to be the first retoucher of negatives of oil paintings. Before the advent of orthochromatic photography he corrected the tones in negatives of his pictures with his own hand, and such a master was he of negative work, that he once painted a negative picture in carmine upon a glass plate. Menzel related an incident in connexion with his picture of the coronation. This work was four years in hand. Some personages had died, and others could not come to Berlin. Count Dohna was of the latter, and Menzel made use of a photograph. But subsequent circumstances brought the Count to Berlin, and Menzel immediately saw that the photograph did not represent the man. Ten minutes sufficed for a sketch, the portrait was repainted, and after a lapse of many years Menzel had the satisfaction of being congratulated by Count Dohna's son upon the excellence of the portrait. Menzel prefers photography to engraving for the reproduction of his work, but he warns the painter to use it as little as possible in painting.

An Example to be Followed.—The Technical Institute at Vienna, with characteristic enterprise, is arranging a section for the letterpress and illustration industries. The City of Vienna provides the site, the Government the funds, and the Printers' and Type-founders' Association a portion of the presses, &c. A large collection of pictures, illustrative of the graphic arts, has already been made, and next September, it is expected, the school will be opened. Practical and theoretical instruction will be given in all branches. Where are we to look for such work in this country?

Prizes Offered.—Messrs. Voigtländer & Son of Brunswick, recently offered three lenses of the value of 20*l.*, 15*l.*, and 10*l.*, for the three best pictures taken with lenses of their make. The right to reproduce the successful pictures shall vest in the firm. They also stipulated for the right to reproduce any of the pictures sent in, upon terms to be arranged, and any photographs they may decide to keep they will pay for at stipulated prices. The Judges were one member of the firm and a well-known portrait photographer.

Payment for Sittings.—The *Deutsche Photographen Zeitung*, in reply to a correspondent, publishes an article on the question of general notices to the public concerning payment for sittings, retention of negatives, &c. It appears that the Berlin Photographic Association has printed such notices for its members, and they carry the authority of the Association's name. The *Deutsche Photographen Zeitung* points out that, much as the best houses might wish to help other members of the profession, such questions cannot be dealt with by hard-and-fast rules. The conditions of each business must be studied. At some establishments such notices would offend, and the effect might be a universally equal, but lower, status.

Spotting Gelatine Prints.—For spotting highly glazed gelatine prints A. Helheim recommends the use of aniline colours dissolved in alcohol, one part of rose aniline with two to three of ethyl green. The addition of a little blue may at times be necessary. The colour dries almost immediately. It is preferable to use little colour, and by repeated strokes with the brush attain the desired tint. The colour may be removed with a clean brush moistened with alcohol, and the surface does not suffer.

Process Plates in 1884.—Liesegang remarks that his friend A. Davanne recollects process plates being produced by Manzi, in 1884, at Goupil's, of Paris. Liesegang confirms this, an etched copper plate having then been placed at his service by the firm. The sample prints sent with it were good. But it appears that the network was so fine and close, that, owing to the backward state of the art of printing at that time in Leipsic and Berlin, any thing approaching the proofs from Paris could not be produced. He was therefore compelled to return the plate unused. Even at the present time Manzi's plates require great care in printing, good ink, and good presses. For these reasons the prints cannot be produced cheaply.

COLOUR SCREENS IN PRACTICAL PHOTOGRAPHY.

As the use of orthochromatic plates is becoming more and more general for the best class of work, it may be well to consider what is the most efficient form of screen for use in connexion therewith.

At the outset it will probably be readily conceded that, while the manufacture of orthochromatic plates has been brought to a high state of perfection and efficiency, the necessary screen for obtaining the full value of the plate lags behind in the background, and is enshrouded in as much mystery as a Salon masterpiece. What proportion of the workers of to-day are able, with any confidence, to select a screen from a dealer's stock that is really suitable for their requirements? Certainly the variety is not likely to be large enough to cause the confusion and hesitation one sometimes notices. No; the truth is, few workers know what a screen ought to be, or what they want it to accomplish. It would probably be amusing, if not instructive, if a collection of screens of all the colours of the spectrum could be placed before some otherwise capable workers for selection without any advice from the dealer; it might resolve itself into a matter of political bias. There are screens of optically worked glass of various colours and shades, single and compound; others of dyed films of both collodion and gelatine; and, again, a small glass trough holding a coloured liquid, which is known as a cell. Coloured glass plates are largely used, but the difficulty at present of getting coloured glass with any degree of regularity, having the necessary properties, is so great, that I need not further allude to it here. A combination of such glasses is the subject of a patent. Coloured films of gelatine or collodion are used by some workers with excellent results, but they are necessarily fragile and require much care to make. The cell has perhaps more advantages and fewer defects than any other form of screen.

Mr. Ives has shown us that it is not so much a matter of any particular shade of colour as the selection of a suitable colouring matter. Some colouring matters have the power of cutting off certain rays of the spectrum which it is desired to reduce, or wholly eliminate, as the case may be, in a much greater degree than others, although apparently giving a similar shade of colour; but, whatever colouring matter is used, depth of colour means increase of exposure, and it is quite possible to have a screen which, while requiring long exposures, is less efficient than one of a lighter shade, requiring much shorter exposures but composed of a suitable colouring matter.

As these remarks apply solely to the use of orthochromatic plates, which, as every one knows, are specially rendered more sensitive to the less actinic rays, and less so to the more actinic, we do not need a screen of such great power in cutting off the violet and ultra-violet rays as when experimenting with ordinary plates; but, even with orthochromatic plates, perhaps the simple aqueous solution of chromate of potash, so far as our present knowledge goes, is the most reliable of all; it is cheap, no skill is required in its preparation, and the tint can be varied to suit every class of plate and subject.

Plain glass cells can be obtained ready-made, but they are rather costly, and can be made at home with little trouble for a few pence. Of course, theoretically, the glass sides ought to be optically worked, but the results of many experiments made to determine this point have satisfied the writer that no one need hesitate to use a good quality of fine plate glass. Certainly the tests were made with the anastigmats of Zeiss and Goerz, but the reader may take it as a fact that optically worked glass is not absolutely necessary for pictorial work. For those who wish to make their own cells the following simple instructions will suffice:—Procure two plates of fine plate-glass, about the one thirty-second part of an inch thick, of suitable size to cover well the lenses with which it is to be used. Three inches square is a good size. Place between these two plates another piece of plate glass, the thickness you desire to make the cell, say, one-eighth of an inch, taking care the central plate is rather smaller than the two outer plates, say, two and a half inches square. Now place the three plates in a vice, such as is used for binding lantern slides, carefully noting the contact is firm, so that the sides of the cell are perfectly parallel. Then cut four strips of sheet celluloid, of such width as

the outer glasses, which can be cemented on them with celluloid varnish, laying the varnish carefully on the edges of the outer glasses with a small brush, then neatly laying on the strips of celluloid, which should just fit the sides. Make up three sides of the cell in this way, and leave in the vice until quite dry and firm, then take it out, and remove the central piece of plate glass by shaking it out of the open side. You now have a simple cell, which can be filled with any coloured solution required, and used in the studio for experimenting with the top open; but it is better to make it tight by cementing on the fourth strip of celluloid after first drilling a small hole in the centre, of sufficient size to admit the tube of a pipette, which is a handy instrument for filling, emptying, and changing the coloured solutions to be used. When the cell is charged, a small plug of indiarubber can be inserted in the hole, and it is then ready for field work of any kind.

The celluloid varnish is merely a jelly made by dissolving a bit of clean celluloid film in a small quantity of amyl-acetate. Being impervious to water, it answers the purpose admirably.

The particular colouring matter to be used for filling the cell must be decided upon by the worker; but, for those who have little knowledge of the subject, I advise a solution made up of one part pure chromate of potash to three hundred parts of distilled water as a commencement. The strength can be afterwards increased as the knowledge of the worker extends, and he can also experiment readily with other colouring matters, recording results for the benefit of his fellow-workers.

F. H. Burton.

ON THE SOLUBILITY OF SILVER IN HYPOSULPHITE OF SODA.

I have from time to time read with much interest the remarks on the above subject in this Journal, and for a long time hesitated between two opinions, as an experiment at one time would flatly contradict an experiment at another. Even now I have never made any systematic attempt to solve the problem, but found my opinion on the effects I have noticed from time to time resulting from almost identical manipulations under different conditions. The conclusions I have drawn are, that the varied results are owing to two causes: difference of temperature and fineness of the divided metal. For example, a negative on a gelatino-bromide plate, developed with pyro-soda and much too dense, left all night in the fixing bath, was almost entirely dissolved by morning. It was hot summer weather, and the dark room was almost unbearable with heat, owing to a large gas burner in the lantern which was going all day, and the ventilation of the room being very faulty. The consequence was that the hyposulphite bath was very much hotter than usual, although the strength of it was doubtful, having fresh crystals added to it from time to time, when the fixing seemed rather too slow.

Under similar circumstances, but with a lower temperature and pyro-ammonia development, an all-night soaking seemed to make no difference. The negative was too dense when it was put in, and too dense when it was taken out. At other times I have found too dense negatives considerably reduced by leaving them in the hyposulphite for an hour or so, and sometimes it made little or no difference. I am uncertain as to the kind of development used, but it would have been either soda or ammonia and pyro; but, in all cases of reduction, it was during hot weather, and using gelatine plates. I have no recollection of *ever* finding a *wet-collodion* negative altered in density in the least by prolonged immersion in the fixing bath of hyposulphite of soda; the *colour* of the image was considered rather improved if hyposulphite of soda was used instead of cyanide of potassium, and on that account alone it was preferred for some kinds of work that did not require after-intensification. Is it that the silver is in a much finer state of division in the gelatine plate than in the collodion one, and is there any difference in silver reduced from iodide and bromide salts that would account for it dissolving from a gelatine plate and not from a collodion one? An albumen print *well toned with gold* can easily be reduced by leaving it in the fixing bath longer than necessary to properly fix it; also a too strong solution of hyposulphite will, in the usual time allowed for fixation, reduce the prints considerably; but I have not seen the image *entirely* obliterated, toned or untoned; but a gelatino-chloride print untoned will be entirely dissolved or obliterated in a comparatively short time in a moderately strong solution of hyposulphite, especially if set in the light. The images, both on negatives and paper prints, are supposed to consist in the main of reduced silver, so there should be some analogy between them so far as the solubility of the silver goes.

Another question arises: Is the *apparent* loss of density, when it does take place, owing to the actual solution of the silver, and its removal from the film, or is it merely altered in character, so that it admits of the more free passage of the light? If a negative on a gelatine film, after being dried, is sprinkled with water, and the drops allowed to dry on the surface, their position will be readily seen by spots of less density, which, however, will barely show in the print; but, if the plate is again soaked in water and dried, these spots entirely disappear; but, if drops of moisture are allowed to remain on the surface when the plate is dried for the *first* time, no amount of soaking afterwards will get rid of them. In either case nothing can have been removed from the plates, although the density is considerably altered. For my own part, I am at a loss to satisfactorily account for the effect; perhaps some other of your readers can explain it.

E. Dunmore.

ON MAKING NEGATIVE REVERSALS WITH CERTAINTY.

[Lewisham Camera Club.]

In nearly all the mechanical processes of photography, and in the carbon process, it is either necessary or desirable to have a negative in which the sides of the picture are reversed.

Many methods have been devised for accomplishing this object, but most of them are so uncertain, that they cannot be adopted in practical work.

The one most generally adopted by the trade is by stripping off the film of the negative, and turning it so that the left side becomes the right, and *vice versâ*. In the hands of experienced operators this plan is fairly successful, but it occasionally fails, and then, as usual, with the most valuable negatives.

One firm, to my knowledge, in this way spoiled some most valuable and unreplaceable negatives, which led to legal proceedings and their financial ruin.

To obviate such a catastrophe, some take the precaution of taking a print from every negative before stripping, so that a copy may be made in case of disaster. Another method frequently used is to take a transparency in the camera with the film of the negative outwards, and from this making another negative, which will be reversed in the course of reproduction.

The method of using a reflector or prism is seldom adopted, as it necessitates its use at the time of taking the original negative, which is seldom practicable, and would not be available for the vast number of negatives now in existence. Several other methods have been suggested which depend upon the use of some chemical added to the developer, but are regarded as curiosities of development more than anything else.

Recently attention has been called by one and another to the well-known fact, that prolonged exposure to light in the camera or otherwise produces reversal.

Over-exposure producing thinness and flatness of the image is the first stage of reversal. This knowledge does not appear to have been utilised, nor has any systematic method of working been given which would result in satisfactory reversals.

For some time I have been interested in the study of this phenomenon, and about a year ago, in turning over an earlier photographic publication, I came across an article on this subject by Mr. Bishop, which I had previously seen, and passed over as only another whim and fad on this question. This time, on reading it more carefully, I thought there was something in it worthy of trial, especially in that it pointed out the necessity of long exposure to obtain a good result, and that poor, thin, foggy reproductions were the result of under-exposure, &c. I set to work to ascertain the critical point of exposure required with an ordinary negative of fairly quick-printing quality. I began by giving a series of exposures varying from a fraction of a second up to 120 seconds and over.

I gave two exposures on the same plate, one being double that of the other, and it was interesting and instructive to watch the changes occurring from a positive image to a perfect reversed negative, and then by degrees a period was reached when no developable effect was made on the plate, and which, when fixed, was clear of any deposit of reduced silver. This last result was obtained by burning three feet of magnesium ribbon about three inches from the printing frame, and the plate was in the developer half an hour.

I had many failures before being able to satisfy myself when the exact point of exposure necessary had arrived, for, unlike the appearances of a plate exposed and developed under ordinary circumstances, flatness and lack of density may arise from under-exposure, whilst hardness and want of detail may be the result of over-exposure. But, again, great over-exposure will reduce both detail and density, which is a second stage of re-reversal, and it takes some little experience to be able to judge correctly.

The result of many experiments proved that, with an average quick-printing negative, an exposure in a printing frame to daylight sufficient to tint a piece of the paper in Watkins's actinometer to his standard, would produce on development a nice clear negative; but, of course, this depends entirely upon the density and colour of the original, and the same judgment is required as in making a bromide print. The method I have adopted of regulating the exposure by this standard is a basis of certainty never hitherto proposed or attained, and is independent of the varying actinic properties of daylight.

Once the negative is classified according to its density and printing qualities, the making of reversed negatives becomes a positive and certain operation. It has been my endeavour to select some other standard of exposure for those who either have no actinometer or available daylight at their disposal, and I find that one foot of magnesium, once burnt about three inches in front of the printing frame, is equal to Watkins's standard tint, and the experiments I make to-night will be with this mode of illumination. There are cases where negatives, either through faults in development or intensification, are so dense that no light can penetrate the high lights in any reasonable time, and, as a reversal requires that sufficient light shall have acted upon the densest portions in order that it may be developed to sufficient opacity, it is necessary that a preliminary exposure shall be made to equal in its totality that received under ordinary circumstances in the camera, so that the desired result may be obtained.

All negatives with great contrasts should have this preliminary exposure, or the reversed negative will be harder than the original. The development may be by any of the usual formulæ, but more strongly restrained, and the colour and character of the reversed negative will be affected by the developer used. In many cases the new negative will be better than the old one; a hard one may be made softer, and one with great detail but flat, can be made to have greater contrast, but where there is no detail, it cannot, of course, be produced in the new one.

It is not my intention to deal with the chemical questions involved in the phenomena under consideration. They have not been resolved by any theory yet proposed; but, there is, doubtless, an oxidation of the silver haloid which is rendered to some extent undevelopable.

In the practical demonstration I give you I hope to convince you of the ease and certainty with which these phenomena can be produced, and to show you how the knowledge may be utilised in the duplication of negatives for any and every process, and where reversal does not destroy picturesque effect.

[Mr. Eastwood, at the conclusion of his paper, exposed several plates behind negatives, the majority of which he had not previously seen, and was very successful in producing splendid results from all. He also showed a very large number of negatives, and the reversals from them, those that were originally too hard being in the reversal nice and soft, and the flat ones the reverse; but the result that attracted most attention was the one previously mentioned that had received an exposure to three feet of magnesium ribbon, the result was a plate so clean that it hardly seemed possible that it had ever been exposed at all.] E. Eastwood.

NOTES FROM THE WEST OF SCOTLAND.

No doubt very many photographers will remember with pleasure Glasgow's first International Photographic Exhibition which was held in the autumn of 1891, and which attracted such large crowds of visitors from all parts of the United Kingdom.

For some time past there has been a strong desire on the part of a large number of prominent amateur and professional workers that another Exhibition should be inaugurated at no distant date, and we are glad to be able to announce that with Mr. George Chalmer's installation, as President of the Glasgow and West of Scotland Amateur Association, something like definite steps have been taken towards furnishing the scheme, the Council of the Association having passed a motion to arrange for the necessary preliminaries towards holding the Exhibition in Glasgow during the autumn of 1897.

There was a strong probability, at one time, that the autumn of this year would have been chosen as the time for holding the Exhibition, but one or two insuperable difficulties cropped up that necessitated the date being placed into next year. Much satisfaction is felt locally that this scheme has now assumed something like a definite shape.

At the opening of the Paisley Photographic Societies Exhibition a very large gathering attended, and one or two new features in connexion with photography were inaugurated. Perhaps there is no society in the kingdom, that can boast of such excellent rooms for holding an Exhibition as those placed at the disposal of the Paisley Society in the Museum Buildings, and it would appear that photography has taken a firm hold of the citizens of this most important business centre. One of the features of the opening night was the production by Mr. Stewart Clark, who kindly presided on the absence of Sir William Dunn, of a most interesting collection of calotype negatives taken by his father upwards of fifty years ago, when Mr. Clark was a mere boy, and who roamed about, attending on his father, when these paper negatives were produced. Mr. Clark made a most interesting address in which he described and contrasted something of the old style of working when he was a boy, as against what he now sees practised by his boy, who, it may be stated is also a most enthusiastic worker.

Lantern nights, at least so far as the west of Scotland is concerned, appear to be losing somewhat of their attractions for the photographic public; for several years, no doubt, there has been too many of such held, until they have become quite stale, as the saying goes.

So we are to have social nights, in which ladies can take a prominent part. These will comprise music and several other interesting items on the programme. The first of these meetings will be held in the Christian Institute on March 6, tickets for which are all taken up already.

WEST LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The Seventh Annual Exhibition of the West London Photographic Society was held on Friday and Saturday last, February 28 and 29th, at the Broadway Lecture Hall, Hammersmith, which, up till two years ago, was the venue selected for the exhibition, the Society in the interim having occupied a hall at the School of Arts, Bedford Park.

The Exhibition, which was confined to members, comprised nearly two hundred photographs, and was in every respect an excellent one, the evenness of quality displayed being very noticeable. Prominent among the exhibitors were Messrs. Harry Selby, Leslie Selby (President), J. J. Adam, J. Stein, G. Lamley, M. W. Cockerell, and G. F. Blackmore. The first-named contributed what was undoubtedly the gem of the collection, a wet-harvest scene, the effects of steamy atmosphere and bright foreground reflections aiding materially towards securing a most realistic and artistic effect out of very simple materials. He also secured the medal for the best lantern slide.

The Society has vastly improved on last year's Exhibition.

SOUTH LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The South London Photographic Society is now holding its Seventh Annual Exhibition at the Camberwell Public Baths. The proceedings were opened on Monday evening by the Marquess of Londonderry, K.G., who, in declaring the Exhibition open, in a few well-chosen words, referred to the progress photography has made in recent years in its application to pictorial expression, and also to its latest scientific developments. He also briefly recounted the progress of the Society as shown by the entries for its Exhibitions, the first attracting no more than ten exhibitors, and the present one just one hundred.

The Judges originally announced were Captain Abney and Messrs. E. J. Wall and L. Warnerke; but, Captain Abney and Mr. Warnerke being unfortunately prevented from acting by illness, Messrs. W. E. Debenham and John Hodges were invited to fill their places. The exhibits are over 400 in number, and are divided into fourteen classes, of which eight, A to H, were reserved for members. Silver and bronze medals were awarded at the discretion of the Judges.

In Class A (Portraiture and Figure Study, including Animals), a silver medal was awarded to J. T. French for a cottage interior, with figures, which, although not quite real-looking is sufficiently so to bear all but a most critical examination, and considerable ingenuity has been displayed in the construction of the picture. Class B (Architecture) is certainly the best class in the Exhibition, and consists of a collection of architectural studies that does credit even to a Society famed for the excellence of the work of this kind performed by its members as is the South London. Silver and bronze medals were awarded to Messrs. E. R. Bull and C. F. Dickinson respectively, but the Judges must have had some difficulty in making these decisions, at least half a dozen other exhibits being nearly equal to the selected ones. In Class C (Landscape and Seascape above half-plate), the Judges awarded a bronze medal to Howard Esler for a study of bare branches entitled *A Winter Noon*, and a second bronze medal to J. Millis for *A Monarch of the Forest*, a picture remarkable, in these days of gloom and murkiness, for its bright effect of sunshine. Class D (Landscape and Seascape, half-plate and under), Mr. A. E. Allen was fortunate in securing a bronze medal for *Swanbourne Lake*, a bright little picture so sharp in its definition that it might serve as an advertisement for a lens-maker. Class E (Enlargements) is not a brilliant class. The bronze medal was given to C. F. Dickinson for a figure subject of little merit; as a piece of technical work, however, the enlargement is a good example. C. F. Dickinson is also awarded a silver medal in Class F, for a set of six views of Salisbury Cathedral admirable for their artistic as well as their technical excellence. In Class G (Pictures taken at a Society's Excursion), Mr. Dickinson is again successful, a silver medal being awarded him for another view in Salisbury Cathedral, while a view of the west front of the same cathedral brings Mr. French another medal, bronze this time. In the Hand Camera Class a pretty little picture, by W. D. Welford, obtains a bronze medal. The class is by no means a strong one, and most of the pictures might have been the results of time exposures.

In the open classes, the Champion Class, as is so often the case, is extremely weak. A silver medal is, however, awarded to *A Study*, by Mr. G. Lafayette. The general open class also is not a very strong one as regards quality. A zoological study, by Mr. H. Sandland, is awarded a silver medal, the subject being *Polar Bears*. A pretty little picture, which well carries out its title, *Lingering Mists*, receives a bronze medal, and another bronze medal is awarded to Mr. C. E. Fairwise, of Washington, U.S.A., for *A Chase for the Butterfly*. In the class for lantern slides that have been previously medalled, Mr. George Hankins adds another silver medal to his now numerous collection for six slides of various subjects, and in the general open lantern-slide class the South London Society gains a distinct triumph, both the silver and bronze medals being awarded to members in competition with all comers. Mr. C. F. Dickinson gains a third silver medal for a set of architectural slides, and Mr. Howard Esler a bronze medal for a set comprising various subjects.

In a class for process work Howard Esler has the field to himself, there being no other competitor. His work deserves mention for its

excellence. Silver and bronze medals are awarded to Mr. A. Seaman, of Chesterfield, and Mr. A. W. Westropp, for stereoscopic slides.

The Apparatus Section makes a brave show. Among the exhibitors are Messrs. Bender & Co., Howell & Co., W. F. Slater, F. S. Thorn, H. F. Viner, E. H. Wilcox & Co., Parkes' Drug Stores, Limited, and The Presser-Roberts Company. The last-named firm receive a medal for a hypo-solution bottle, graduated so as to avoid the necessity of weighing the salt, and Parkes' Drug Stores also receive a medal for the most effective stall.

WOOLWICH PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The Woolwich Photographic Society held its Second Annual Exhibition of Photographs and Apparatus on Thursday, Friday, and Saturday, the 27th, 28th, and 29th ult., at St. John's Schoolroom.

In the Members' Class the number of exhibits—174, the work of twenty-eight members—is a testimony to the activity of the Society. Among the pictures there was a considerable number which did credit to their Exhibition and to the society; but we cannot avoid the impression that the Exhibition, as a whole, would have gained had a wise discretion been exercised in the work of selection. There were some photographs on the walls which, we think, were amongst the worst we have ever seen publicly exhibited. The loan collection included works by such well-known names as F. W. Edwards, C. H. Oakden, H. Esler, A. Pringle, J. C. S. Mummery, most of the pictures being old-fashioned friends; and enlargements, photogravures, &c., by Messrs. Morgan & Kidd, and the Autotype Company, also assisted to decorate the walls.

The trade section made a goodly show, the stalls being occupied by Messrs. R. & J. Beck, W. Butcher & Son, B. J. Edwards & Co., Marion & Co., D. Noakes & Son, Walter Tyler, Thompson & Son (Manchester), The Filmax Co., The Thornton-Pickard Co., and T. H. Powell, the local dealers, Messrs. E. C. Carter & A. J. Wing, also being represented.

In addition to that afforded by the exhibition of pictures, plenty of amusement was provided for visitors, there being an admirable musical programme for each evening, and a lantern entertainment, while a new and popular feature was introduced in a demonstration of the method of obtaining shadowgraphs, by means of Röntgen's X rays.

NEWTON'S NEW HIGH VACUUM "FOCUS" TUBE FOR ELECTROGRAPHY.

Messrs. Newton & Co., of 3, Fleet-street, E.C., have introduced certain modifications into the Crookes' vacuum tube used for "photographing" by the Röntgen rays, which have the dual advantage of shortening the exposure, and, so to say, focussing the impression. Hence the term "focus" as applied to these tubes, of which Mr. Alan Swinton writes to Messrs. Newton as follows:—

"I have exposed several plates to the new 'focus' tube that you kindly sent me this morning. The results are exceedingly good, and surpass in sharpness any that I have so far obtained.

"The necessary exposure seems also to be remarkably short. In particular I have taken a most successful elbow joint with two minutes' exposures. A hand which shows in a surprising manner the texture of the bones with one and a half minute's exposure and a mouse with one minute's exposure.

"All leave little to be desired except that the mouse would have been better with a shorter exposure.

"It is my opinion that the designer of this new tube has made the greatest advance so far known as regards the practical application of Röntgen's photography."

In order to give us an opportunity of judging of the improvement in the results obtainable with the focus tube, Messrs. Newton kindly took an electrograph of the very hand that is writing these sentences, giving an exposure of two minutes and producing an excellent result which allowed us to contemplate the structure of our finger bones. The detail and sharpness of this negative and one of a pair of eyeglasses electrographed through a leather case were so remarkable that we have no hesitation in endorsing the praise Mr. Swinton has passed on the Newton Focus Vacuum tube.

The Inquirer.

**** In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

Collodio-Chlordie Paper.—"Wet Plate" says: "I want to prepare a collodio-chloride paper with the following qualities: very thin film, for partly printing, and then developing to right depth, and toning to ordinary print out colours, and also for transferring whilst still wet, if possible. Can any one assist me?"

The Nature of the Collodio-chloride Image.—"W. B. B." writes: "Referring to your remarks in last issue (p. 144) on the non-action of nitric acid on the printed-out image of collodio-chloride, have you or any of your readers noticed the following peculiar circumstance: I tried the effect of nitric, hydrochloric, and nitro-hydrochloric acids on the reduced silver deposit, the emulsion being poured, for the purpose, upon white card upon which there was some printing—upon a visiting card, in fact. The peculiarity is that, whereas none of the acids produced much if any effect on the deposit lying on the white card, where the printed characters were the two last-named acids bleached the deposit, and the printing came out white on a dark ground. The acid was applied in the undiluted state and allowed to act for some minutes, which seem to negative my first idea that the image lying on the printer's ink was thinner, and therefore more easily and quickly penetrated. Can any one suggest an explanation?"

Films of Pure Silver Bromide.—"The inquiry of 'A. W. S.' on this subject, in this column last week, reminds me of some experiments made some years ago, which point to a doubt as to whether pure bromide of silver is amenable to alkaline development. Bromide of silver, like the chloride, is fusible by heat, and I adopted that method of separating the silver from a large quantity of spoilt collodion emulsion, which was first evaporated to dryness, and then burnt in an ordinary crucible and afterwards further heated. The fused bromide of silver was then poured out into an iron plate, forming, when in the fused condition, a deep red liquid, and solidifying into a dirty grey slag having a sonorous ring like metal or porcelain. When broken, it showed a yellow or nearly white fracture like ordinary precipitated bromide, the grey colour being merely superficial, and probably consisting of subbromide or an oxybromide. Out of curiosity, by means of abrasion and otherwise, I removed the greyness from the smooth side of several of these fused pieces, in the dark room, of course, producing a perfectly clean surface of silver bromide, and these were exposed for various periods under a negative or masks cut out in cardboard. But under no condition could I obtain any photographic result on development. With solutions of normal strength there was no action at all, and, if increased sufficiently to cause reduction, it was uniform over the whole surface. The act of fusion may possibly modify or destroy the condition of sensitiveness, but I think it is equally probable that, in the absence of a 'restrainer' in some form, bromide of silver is practically undevelopable.—Syntax.

Panoramic Pictures (To "Lakeland").—"Premising that no such devices can possibly render the subject in correct perspective, the following is a plan which I used to adopt, with fair success, many years ago, and curiously enough it was while on a visit to the Lake district that I first resorted to it as a "scratch" method of securing a panorama. I was using a film camera and the old-fashioned stereo size of plate, $6\frac{3}{4} \times 3\frac{1}{4}$, with lenses of $4\frac{1}{2}$ inches focus, which entirely failed to take in the vast sweep of distance as seen from a point on the Ambleside-road, near Troutbeck Bridge. It occurred to me to gain my end by making two pictures, side by side, on the same plate, using the right-hand lens for the left-hand side of the view, and *vice versâ*, and after one or two failures succeeded fairly well. A pencil line was drawn down the centre of the focussing glass, and a distant mountain peak—I think it was Scaw Fell Pike—in the centre of the composition, was made to coincide with that line, and an exposure made with the right-hand lens. The camera was then swung round until, with the left-hand lens, the same object was brought into the centre line, and the second exposure made. The division in the camera allowed the two pictures to overlap to the extent of about a sixteenth of an inch, and this caused a slight mark down the centre of the compound picture, but beyond this there was not much difficulty in ordinary landscape work if the camera was fairly accurately levelled; but, on subsequent occasions, when working the same plan for architectural work at close quarters, the necessity for an absolute level became very palpable, and the faulty perspective rather pronounced. The same plan can be followed with a single lens and sliding front, the alternate halves of the plate being covered; but, in these days of wide-angle lenses, a better result would accrue from a single exposure, and there would not be the least difficulty in getting a lens of $4\frac{1}{2}$ inches focus, or less, to cover a length of plate greater than that given above."—*Stereoscopic.*

Writing on the same subject, "Narrow Angle" says: "It is very seldom that a really 'panoramic' picture is found that is suitable for camera reproduction, but very good imitations can

often be made by cutting off a lot of the sky and foreground from an ordinary subject, the remnant conveying the idea of having been taken with a very wide-angle lens. I have done many pictures in Scotland, North Wales, and elsewhere, in this manner, using 12 × 10 plates divided in the longest direction so as to make 12 × 5, and lenses from 14 to 24 inches in focus. If the lenses cover the plate well, there is no necessity for any great amount of 'slide' in the front of the camera; all that is necessary is a piece of thin wood or metal to fit in the back frame of the camera inside the focussing glass, and cover one half of the plate; the picture is then brought into the other half by simply tilting the camera.'"

ARTIGUE PAPER (To W. BENINGTON.)—"I do not quite gather whether Mr. Benington desires information concerning the Artigue paper, or whether he refers to coating paper oneself with bichromated gum and pigment. With regard to the former, the paper and sawdust can be obtained, I believe, of Messrs. Adams & Co., in the Charing Cross-road, and if the instructions are followed, especially correct exposure and the temperature of the first tepid water, it is extremely simple to get the most perfect results. The paper should be sensitised by immersion, and not by brushing on the back, and to keep the paper flat in the bath it is a good plan to clip each end of the sheet of paper with a bulldog letter clip, taking them off when the sheet is quite moist, to allow for expansion. By the way, I recommend this plan for rollable celluloid films, it obviates the difficulty of the horrid curling. The surface of the Artigue paper is very tender when damped, and must not be touched with the fingers; care should also be taken to avoid air bubbles in the sensitising bath. With regard to coating oneself, it is necessary to be a good hand at washing colour on paper, and even those who are used to doing so in water-colour painting will find that it is by no means the same thing when one comes to adding a clogging gum to the wash. The object to be aimed at is a deposit of colour held in suspension in just sufficient of the gum, so that each grain of colour is separate, as it were, from its neighbour, and not one on the top of another. It is almost so in Artigue's paper, and, though by hand one cannot hope to arrive at such a result, with practice one can get sufficiently near to it. The coating, therefore, must be of extreme tenuity, so that the grain of the paper shows through. As to the pigments, generally speaking, either dry colours or moist tube colours will do; in as fine a state of division and mixtion as possible. All colours, however, do not answer, without going into the question too fully; for the present, I may say that, for blacks, lamp-black, bone-black, blue-black, and charcoal grey are good—Indian ink is generally gritty. Indian red, or red ochre for reds, the latter tempered with blue for instance. Ordinary sepia is good, but not Vandyke brown. Blanc d'argent or colours which contain a similar substance appear to be impossible. The paper should, of course, be damped before coating. Most Whatman papers are difficult, and I think French drawing papers—not too rough—the best. The mixed bichromate (ten per cent.) and gum as thick as can be made, with lemon juice (or citric acid) in equal quantities, can be put in a dish or saucer and the tube or dry colour added until the requisite tint is obtained and well mixed, then applied with a broad flat brush and sweetened with a softener. It must be admitted that it is not an easy thing to do, and I hope before long to be able to propose an improved method."—ALFRED MASKELL.

Our Editorial Table.

CATALOGUES RECEIVED.

SECOND-HAND list of photographic and scientific sundries, and catalogues of second-hand cameras, &c., photographic lenses, camera lenses and accessories, from Messrs. Morley & Cooper, 70, Upper-street, Islington, N.

THE A B C OF PHOTOGRAPHY.

The London Stereoscopic Co., 106, Regent-street.

THE twenty-fourth edition, of 5000, of this little book has just been issued. To the more elementary part of the work, the value of which we recognised years ago, chapters on photo-micrography, orthochromatics, stereoscopy, and other "advanced" subjects have been added, and the book, evidently the work of a competent authority with a plain and attractive style of writing, therefore appeals to the experienced as well as to the beginner in photography. Many of the Company's well-known productions are described throughout its pages, thus adding to its value as a guide book.

MESSRS. S. B. BOLAS & Co, 11, Ludgate-hill, E.C., send us their price-list of collotype printing. It is got up in the form of a neat booklet, and includes some specimens of collotype printing from the firm's own negatives, both of which are of the highest quality.

News and Notes.

MR. HENRY BALL, chemist, of 121, Lord-street, Southport, informs us that he has a dark room for changing and development free to customers.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, March 10, 1896, at 12, Hanover-square, at eight p.m. *Notes on Medical Photo-micrography*, by Edmund Roughton, F.R.C.S., and Charles Cosens, M.R.C.S.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, March 11. Mr. T. E. Freshwater, F.R.P.S., F.R.M.S., will lecture upon *Stereoscopic Projection*. Afterwards the lantern will be available for members' lantern slides. Visitors are welcomed by the members.

THE Gem Dry Plate Company, Limited, offer 10*l*. in cash prizes to amateur photographers for quarter and half-plate landscape negatives on Gem Universal or Meteor plates; 10*l*. in cash prizes to professional photographers for cabinet portrait negatives on Gem Portrait plates. Particulars may be had of the Gem Dry Plate Company, Limited, 92, Villiers-road, Willesden-green, London, N.W.

"PROCESS WORK," commencing with the March number, will henceforward be published by Messrs. Percy Lund & Co., Limited, of Bradford and London, in an improved and larger form as a threepenny illustrated monthly, under the title of *Process Work and the Printer*. A distinct section will be devoted to the printing trades, and will give especial attention to the artistic printing of process illustrations.

A SOCIETY FOR STOKE NEWINGTON.—Mr. P. G. Fox, of 18, Rectory-road, Stoke Newington, writes: "I beg to inform you that on the 24th ult. a meeting was held at the Farleigh Hotel, Amhurst-road, N., and a new Society formed, called the Amhurst Photographic Society. The next meeting takes place at the above address on Monday, March 9, at eight o'clock, when the rules will be confirmed and general business conducted. Gentlemen who are interested in photography will be made heartily welcome."

WE are sorry to learn of the death of Mr. Thomas Samuels, the *doyen* of the Chancery Registrar's Department, which took place on March 1, at the age of sixty. For many years he had held the office of churchwarden of Hadley, Barnet, besides that of trustee to most of the local charities, and was formerly a member of the Local Board; but it is principally as a photographer, and the inventor of highly ingenious apparatus connected with photography, that his name will be most familiar to our readers. Mr. Samuels was a member of the Royal and other photographic societies, and designed many improvements in hand cameras and plate-changing appliances.

THE Birmingham Photographic Society's Eleventh Annuual Exhibition and Competition will be held in the Exchange Assembly Rooms, New-street, on May 4, 5, 6, 7, 8, and 9, 1896, opening at 2 p.m., on Monday, May 4, and continuing from 10 a.m. until 10 p.m. each following day. Fourteen silver medals, bronze medals, a silver challenge cup, and other valuable prizes (besides certificates) are offered for competition. There will also be an Exhibition of apparatus, and lantern entertainments will be given each evening. Entry forms and further particulars may be had of the Hon. Secretary, C. J. Fowler, Court Mount, Erdington, Birmingham.

BEVERLEY PHOTOGRAPHIC AND SKETCHING SOCIETY.—The Third public Exhibition of Photographs, Paintings, and Drawings in connexion with this Society will be held in the Assembly Rooms, Beverley, on Easter Monday, April 6, 1896. Numerous silver and bronze medals and certificates will be awarded as prizes. Classes:—Section A (open): 1. Landscape, Seascape, and Architecture; 2. Portraits, Figure Study; 3. Instantaneous Hand-camera Work (six direct prints, on one mount or otherwise); 4. Enlargements; 5. Lantern Slides (set of six); 6. Photographs of the Invisible or New Photography (prints or slides). Section B (members only): 1. Landscape, Seascape, and Architecture; 2. Portraits, Figure Study; 3. Club Excursion Work; 4. Enlargements; 5. Lantern Slides (set of six). All entries and other communications to be addressed to the Hon. Secretary, T. J. Morley, Toll Gavel, Beverley.

BROMLEY CAMERA CLUB.—A General Meeting to formally inaugurate the newly formed Bromley Camera Club took place at the Bromley School of Science and Art on Friday evening, February 21, when there was a fair attendance of local enthusiasts in the art. In the absence of Dr. Scott the chair was occupied by Mr. H. C. Bond, M.A., F.C.S. It was decided that the Club's room be at the Literary Institute, Widmore-road, where there will be a dark room and an enlarging room. Mr. H. C. Bond proposed that Mr. S. B. Webber be the first President of the Club, and the proposal was carried unanimously. The following gentlemen were then elected as a Committee: Messrs. James, A. J. Hicks, Stanley Hawkings, C.E., — Bond, M.A., F.C.S., Dr. Playfair, Dr. Scott, and Dr. Schnitzler. Mr. Grundy was elected as Treasurer. It was proposed that Mr. Godward be elected to fill the position of Secretary, and this was agreed to.

CARDIFF PHOTOGRAPHIC SOCIETY'S EXHIBITION.—The Hon. Secretary writes: "I shall be obliged if you will announce that the Judges at our forthcoming Exhibition will be Messrs. Valentine Blanchard, Fred Hollyer, and B. Gay Wilkinson; also that we have extended the date for entries to the 20th inst."

Patent News.

THE following applications for Patents were made between February 19 and February 26, 1896:—

DEVELOPING.—No. 3603. "Improved Means for Separating Photographic Plates during Development." Communicated by M. Lehmann. F. BISHOP.

PRINTS.—No. 3764. "An Improved Method of Producing Photographic Prints." J. MARTYN.

KINETOSCOPE PHOTOGRAPHS.—No. 3777. "A New or Improved Means for Giving Intermittent Motion to a Strip or Film for Taking or Exhibiting Photographs." H. W. SHORT.

MAGAZINE CAMERAS.—No. 3833. "Improvements in Magazine and other Cameras." W. GRIFFITHS.

AUTOMATIC PHOTOGRAPHIC MACHINE.—No. 3882. "Improvements in Automatic Photographing Machine." Communicated by E. N. Dickerson. Complete specification. H. H. LAKE.

SHUTTERS.—No. 3896. "Improvements in Photographic Shutters and in the Method of Operating the same." Communicated by N. Hansen. Complete specification. G. C. DOWNING.

SCIAGRAPHY.—No. 3902. "Improvements in Sciagraphy or Photography by Means of Röntgen's X rays." S. D. ROWLAND.

LANTERN PLATES.—No. 3949. "Combined Reducing and Enlarging Camera for Making Lantern Plates." R. D. SMITH.

PLATES.—No. 3997. "Improvements in Photographic Plates." I. N. V. BABLON.

PRINTS.—No. 4022. "Improvements in the Method of Producing Combined Photographic and Colour-printed Prints." W. SCHMEER.

VACUUM BULBS.—No. 4023.—"Improvements in the Manufacture of High Vacuum Bulbs for Photographic Purposes." A. W. PORTER.

TRIPOD HEAD.—No. 4037. "An Improved Tripod Head for Hand Cameras." G. HOUGHTON.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
9.....	Lantern Society	*The New Photography.* H. Snowden Ward, F.R.P.S.
9.....	North Middlesex	Demonstration of Carbon Printing. The Autotype Company.
9.....	Richmond	Discussion: *Photography and Art.* Opened by C. H. Davis.
10.....	Brixton and Clapham	*Concerning Hand Cameras.* W. Fraser.
10.....	East London	General Discussion.
10.....	Hackney	*Photography in Unlikely Places; or Notes on Selection of Subjects.* A. Horsley Hinton.
10.....	Royal Photographic Society ...	*Notes on Medical Photo-micrography.* Edmund Roughton, F.R.C.S., and Charles Cosens, M.R.C.S.
11.....	Borough Polytechnic	Flashlight Photography.
11.....	Croydon Camera Club	Lantern Night.
11.....	Photographic Club	*Stereoscopic Projection.* T. E. Freshwater.
12.....	Ashton-under-Lyne.....	*A Visit to America by the White Star Line.* By One who has been.
12.....	Bradford	Set of Slides lent by Messrs. R. W. Thomas & Co.
12.....	Leeds Camera Club.....	*Ecclesiological Photography.* S. Margerison.
12.....	Leigh	*Chemistry of Photography.* W. Hampson, M.P.S.
12.....	London and Provincial	*The Stigmatic and the Dallmeyer-Bergheim Lenses.* T. R. Dallmeyer.
12.....	Oldham	Enlarging. The Members.
12.....	Woolwich Photo. Society	*The Preparation of Mirrors for Photographic Purposes.* J. Miller
13.....	Bournemouth	*The Chemistry of Photography.* W. Jones.
13.....	Croydon Microscopical	Meeting to Arrange Summer Excursions.
13.....	Ireland	*Fountains Abbey.* J. Simpson.
13.....	West London.....	*The Slide Rule—Its Use, Photographic and otherwise.* G. E. Varden.
14.....	Birkenhead Photo. Asso.	Demonstration.
14.....	North Middlesex	Annual Dinner.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 27,—Mr. R. P. Drage in the chair.

THE INFALLIBLE HAND CAMERA.

Mr. S. HERBERT FRY showed and explained the working of McKellen's Infallible hand camera, the principal feature of which was in the method of changing, which is simple, and not likely to get out of order. At the bottom of each sheath are two projecting pins, which work in two grooves running forward from the back of the camera in connexion with two discs mounted on a shaft, in each of which there is a slot capable of receiving the projecting pins of one sheath. Connected with the shaft is an external key, which, on being revolved as far forward as it will go, deposits the exposed plate at the bottom of the camera, where it is tightly gripped. The key is then turned back, when the pins of the succeeding sheath engage with the discs, and the next plate is ready for exposure. It is a magazine camera, and can be worked with films or plates, or both together. It is fitted with Heywood's direct vision finder, consisting of a sight hole and a wire frame the size of the plate on the top, and has a revolving safety shutter.

THE NEW PHOTOGRAPHY.

Mr. T. E. FRESHWATER prefaced his display of slides on this subject by a few remarks as to his own experiments. He had been aiming to reduce the exposure to a minimum, and likewise the amount of current necessary to excite the X rays in the tube. Messrs. Newton & Co. had been able to make a tube which enabled a much shorter exposure to be given, and he showed two negatives, one of a watch-chain taken with twenty-five seconds' exposure, and another of two fingers with one minute's exposure. The coil used was the smallest yet brought to play in this matter, giving a one-and-a-half-inch spark and the current was obtained from a four-cell Grove battery. With the new tube introduced, the rays can be focussed down on to a given space, and, he believed, with the small coil he used, would cover at least two feet. He could not agree with certain statements that had been made that the plate developed up from the back.

The HON. SECRETARY said the idea was that, if the action is due to fluorescence excited on the glass, the development would be supposed to take place at the back; but, suppose the silver right through was affected, the part that receives the developer first would develop first, although the action may have started from the back.

Mr. FRY inquired as to the relative behaviour of fast and slow plates, and whether Mr. Freshwater had tried films or bromide paper?

Mr. FRESHWATER intended to go into this at an early date, and promised a practical demonstration before the London and Provincial Association.

Mr. GRUNDY said that Mr. Swinton, working with a ten-inch coil with a four-inch spark, had obtained a negative of a coin in one second, and a hand in fifty-five seconds.

The slides shown included some by Messrs. Freshwater, E. D. Bartlett, Coles, Rapson, and Medland.

PHOTOGRAPHIC CLUB.

FEBRUARY 26,—Mr. R. P. Drage in the chair.

A good muster of members was present to hear Mr. HENRY STURMEY's account of a tour in Brittany. The lecturer, who recounted his adventures in an easy and colloquial manner, took his hearers through some most interesting country in Brittany. Starting at St. Malo, Mr. Sturmey described his wanderings and his photographic adventures, the resulting transparencies from which were thrown upon the lantern screen, and evoked from time to time the approbation and approval of those present. The lecturer had evidently started with his photographic eye very wide open, and had kept it so. In the result, an interesting series illustrating the better and lesser known towns in Brittany, antiquities, and fast-disappearing local costumes, the characteristic architecture of the sixteenth century, market towns, and buildings. These, varied with local traditions, marriage, and other countryside customs, made a very interesting evening, for which Mr. Sturmey had the hearty thanks of an attentive audience.

Camera Club.—If any one having the necessary knowledge were to make a list of those subjects in which photography is particularly efficient, he would most surely place near the top of the column

MOUNTAIN SCENERY.

It may be that the white snow against the dark rocks, and the general absence of strong colour has something to do with this; but we must also take into account the marvellous cloud effects, with the alternations of light and shade caused thereby, and the delicate gradations on the sunlit snow which are so wonderfully rendered by the gelatine negative. Snow pictures of the Alps there are in plenty, but they are usually taken in the regular tourist season, and not when the ice king holds full grip on mountain torrent, glacier, and snow-clad peak. The paper read last week at the Camera Club by Mr. J. J. HODDINOTT, giving an illustrated account of three successive winter holidays in the Alps, dealt therefore with such a new phase of the subject that there was an unusually good attendance of members and their friends, and among the latter might be recognised many leading members of the Alpine Club. Mr. Hoddinott's paper might have been divided, like an old-fashioned sermon, into three heads, but we hasten to say that, in no other respect, had it any likeness at all to one of those academical discourses. He spent his first holiday, in 1893, at Chamounix; his second, the year later, at Zermatt; while last winter found him at Grindelwald. At each place his camera was busy, and the various examples of his work, shown by the electric lantern, proved him to be quite an adept at snow scenery. Some moonlight views of Mont Blanc, taken from his hotel window with an exposure averaging forty-five minutes, were really wonderful examples of what can be done in this way. The moon was so nearly vertical that no shifting of shadows was discernible in the photographs, and the snow contrasted very beautifully with the dark sky overhead. In several of the daylight views, Mr. Hoddinott employed a telephoto lens, bringing distant peaks, châlets, and villages into view, which were reduced almost to nothingness in the ordinary photographs which he compared with them. He also showed a number of pictures of gigantic icicles, some having been formed by a mountain torrent, having become solidified by the frost as it leapt over a precipice. It was most interesting to see such good photographs of Alpine scenery taken under such conditions. Even in this country wintry weather brings about sudden storms and showers which are productive of wonderful cloud effects, effects which are seldom seen in summer. So it is in the Alps, as was proved by some of these photographs, which showed cloud banners streaming from the higher peaks, and oceans of vapour crossing

the valleys. A pleasant relief to the mountain scenery was presented by the tobogganning races and skating pictures taken at Grindelwald. Most of these latter pictures were taken in the absence of sunshine with a shutter set at one-seventieth of a second. Any one who wishes to profit by Mr. Hoddinott's example, and has the temerity to brave the winter Alpine blasts, is recommended by him to choose Zermatt as the most favourable centre from which to attack the giant peaks in their wintry jackets.

Croydon Camera Club.—February 26.—There was a full attendance at the Braithwaite Hall, and a programme replete with interesting items. The proceedings commenced with a *tour de force* of unusual attractiveness, the banjo team of ten ladies and gentlemen being photographed with flashlights by Mr. J. Smith, who, having developed the negative, handed it to Mr. G. W. Jenkins, the latter producing therefrom a lantern slide, which was ready to be shown on the screen within forty-five minutes, although not exhibited until, somewhat later, Mr. Bridge finished his lecture. The first portion of the lantern display took the form of

A Trip to Norway,

undertaken by Mr. Bridgman and Mr. F. A. Bridge, the latter of whom acted as lecturer. The views of scenery and people (by turns grand or odd), and the many curious, apt, and humorous remarks by which the pictures were accompanied, thoroughly pleased the large and attentive audience, which, on the termination of the lecture, at the instance of the President (Mr. Hector Maclean, F.R.P.S.), very warmly testified their high appreciation of all they had been shown and told. The second part commenced with a miscellany of members' slides. These were much curtailed in number on account of the flight of time. The scenes at Kimberley and the De Beer's mines were unusually interesting, and the series of slides by Mr. J. T. Sandell of surpassing technical perfection. The following members were represented by views :—Messrs. Maclean, Frost, Holland, Elkin, Bray, J. Noaks, G. W. Jenkins, Underhill, Wreford, Sandell, and J. Smith. In conclusion, Mr. Maclean explained a number of newly made shadowgraphs, kindly lent by Mr. Campbell Swinton ; he also, by the aid of a diagram he had specially prepared, lucidly described the construction and action of a marvellous instrument, which Mr. Swinton only succeeded in perfecting the previous day, called a cryptoscope. The music in the various intervals was of unusual tunefulness and acceptability.

East London Photographic Society.—February 25.—Annual General Meeting, Mr. Walter R. Gould in the chair.—The report pointed to a steady progress, and several pounds are in hand on the past year's working. The election of officers for the ensuing season resulted as follows :—*Vice-Presidents :* Messrs. E. Stone and Walter R. Gould.—*Council :* Messrs. E. Atkinson, Charles Tylee, R. J. Tylee, and F. Uffindell.—*Librarian :* Mr. S. Aldridge.—*Lanternist :* Mr. F. Uffindell.—*Secretary :* H. G. Wallis, 84, High-street, Shoreditch.

Hackney Photographic Society.—February 25, Mr. A. Barker presiding. A paper was read by the Hon. Secretary (Mr. W. Fenton-Jones) on

"Stereoscopic Photography."

He said that many considered this branch of photography to be difficult, but that was a mistake, and it would be found very easy when the few simple working details had been mastered. A special-sized camera was unnecessary, an ordinary half-plate, with square bellows, being quite sufficient. In fact, the speaker preferred the half-plate size, because the camera could be used for both stereoscopic and single-picture work, and plates of that size could be obtained almost anywhere, an important consideration when away on a holiday. For twin-lens work a division was necessary ; but this was very simple, and might consist of a bellows-folding arrangement made to detach when required. Concerning the lenses most suitable for this work, difference of opinion existed, some preferring single combinations, as giving more brilliant results, but he preferred a pair of five-inch doublets, as being generally most suitable for subjects of all kinds. But, whatever lenses were used, they should be accurately paired and, for average work, be mounted with their central axes three inches apart. The speaker preferred the use of a shutter instead of caps, and recommended the Thornton-Pickard. The use of two lenses was not absolutely necessary. As an alternative, two pictures in succession might be taken with one lens by shifting the position of the camera a few inches sideways between the exposures ; or Brown's stereo transmitter might be used with good results. As regards choice of subject for stereoscopic work, almost anything would do, with the exception of distant objects and those with excessive contrasts. Indeed, the avoidance of strong contrasts was one of the most important considerations to be borne in mind, if successful results were expected. With this object in view, exposure must be full, and development weak and kept well under control, the aim being to get a result which would be too flat for a single picture. In printing, undoubtedly the most beautiful results were in the form of transparencies. These could be either with the two pictures on one plate of the correct size (taking care, of course, to transpose them), or be on two separate lantern-sized plates. If the latter method were adopted, it would be found very convenient, for the two plates could be placed with the negative in a half-plate printing frame, printed, and, when finished, transposed, and placed side by side, having previously had a thin slip of their inner edges removed, so that they might be placed together with their centres at from two and three-quarter inches to two and seven-eighth inches distance apart. A cover glass should then be placed over them, and the whole secured by masks and binding strips. The speaker did not recommend the use of ground glass for covers, as it showed the grain too much in the stereoscope. For paper prints a printing paper of smooth surface should be chosen, such as gelatino-chloride. In this connexion he had used the Ilford special paper, and had found it very useful to reduce the contrasts from hard negatives.

North Middlesex Photographic Society.—February 24, Mr. Gosling in the chair.—Mr. G. H. Moss read a paper on the preparation of

Collodio-chloride and Plain Salted Papers.

He coated a sheet of baryta-faced paper with collodion emulsion in a frame like a dish with a hinged bottom, which clamped the paper down and kept it flat. The emulsion was poured on and out at one of the corners, which acted as a spout. After draining, the paper was taken out and hung up to dry. The formula of the emulsion was as follows :—A. Zinc chloride, 12 grains ; tartaric acid, 5 grains ; citric acid, 5 grains. Dissolve in 1½ ounce of methylated sulphuric ether. B. Silver nitrate, 60 grains. Dissolve in 30 minims of distilled water by heat. When dissolved, add 100 minims of pure glycerine and 4 ounces of methylated alcohol. Add 60 grains of gun-cotton (high temperature), well shake, and then add 1½ ounce of ether. By gaslight pour A, a few drops at a time, to B, and well shake. After standing twelve hours and filtered or decanted, it is ready for use. He showed numerous examples of prints by this process, and also of plain salted papers prepared as follows :—Crystallised sodium chloride, 150 grains ; ammonium chloride, 100 grains ; pot, bichromate, 4 grains ; water to 20 ounces. The paper is soaked in this for from three to five minutes and dried, then floated on a bath of silver nitrate, 1 ounce ; citric acid, 150 grains ; water to 8½ ounces. Float for about two minutes. This paper will be found printed in full in The British Journal of Photography for August 9, 1895.

Richmond Camera Club.—On the 17th ult., Mr. Ennis in the chair, Messrs. Braham and Barton, of the Autotype Company, gave a demonstration of carbon or pigment printing, clearly explaining the process, and developing a number of prints, single and double transfer, and transparencies. On the 24th Mr. Ennis again presided, and Mr. L. Taylor lectured on the subject of

Collodio-chloride Paper.

He contrasted the capabilities of the paper with those of gelatino-chloride, finding the former in most respects preferable, while his comparison of the merits of English and foreign collodion papers was not wholly in favour of the former. He showed numerous finished prints, on various brands of paper, showing great variety of tone, and finally toned a number of prints in the sulphocyanide bath.

Birmingham Photographic Society.—February 25, Mr. W. Jones (Vice-President) in the chair, one hundred and fifty members and friends present.—The Walsall Amateur Photographic Society gave a Lantern and Musical Evening. The programme consisted of views taken on excursions to Matlock, Haddon Hall, Tintern Abbey, Chepstow, Dawlish, Teignmouth, Torquay, Cockington, and Brixham. Figure and flower studies—Messrs. W. Meikle, E. A. Day, T. Partridge, and W. A. Hubball. The slides were of a high standard of excellence, and the many effects were much appreciated.

Cleckheaton Photographic Society.—February 19, Mr. D. R. Holdroyd presiding.—Mr. Walter Booth, of Bradford, gave a lecture on

Platinotype Printing.

The lecturer demonstrated the cold-bath process, and developed several papers successfully. He gave formulæ for developing and toning, afterwards toning a number of prints to various shades of sepia, brown, red, green, and blue. He showed some beautiful examples of his own work in platinum, showing its permanency and also that, after all, a photograph may be made truly a work of art.

Derby Photographic Society.—February 18, Mr. A. B. Hamilton in the chair.—Mr. W. I. Chadwick, of Manchester, lectured to a large audience on

Stereoscopic Photography.

The lecture, which was entirely extempore, and illumined with many characteristic flashes of wit, was illustrated by lantern slides of diagrams showing the laws of vision, and by stereoscopic slides, all of which were explained in a lucid and comprehensive manner. Mr. Chadwick laid great stress on the importance of these laws as applied to stereoscopic work, and proved how necessary it was that the broad part, or extra portion of the views, should, in both halves, be next the centre. For want of this knowledge many views were wrongly cut, and the desired effect could not be obtained. He urged upon those present to make transparencies rather than paper prints, as the result was far and away more real and satisfactory. He also gave valuable hints as to an artistic yet easy method of colouring transparencies. At the close of the lecture stereoscopes and slides were handed round to the members.

Liverpool Amateur Photographic Association.—February 27, the President (Mr. J. Sirett Brown) in the chair.—Mr. Charles Hill, Mrs. Bell, Messrs. Ernest Walker and W. Sutherland were elected members. The President then drew attention to the future engagements, and especially to a lecture by Mr. Eadweard Muybridge on March 19 in the City Hall, after which Mr. Charles Sharp, F.L.P., proceeded to deliver his lecture entitled, *The Harvest of the Ubiquitous Eye*, illustrated by 100 lantern slides.

Oxford Camera Club.—February 24.—A lecture was given by Mr. A. Moralt Dillon, of Lincoln College, on

Cilicia and the Taurus Mountains.

It was illustrated by lantern slides from negatives taken by the lecturer, which gave a very good idea of the peculiarities of the country. The parts specially noticed were those round Tarsus, a railway running from Mersina on the coast through Tarsus to Adina. Views were shown of the square at Mersina, with natives eating cucumbers and enjoying the public fountain, as well as of the fine columns still standing of the Argonaut Colony at Soli, and the huge stone coffin of Aratus at Pompeiopolis. A procession of camels was an interesting view, donkeys always going in front to show the camels the way. From Mersina the Cave of the Seven Sleepers was visited. At Tarsus there was abundant material for the camera, among other things the Roman gate, pilgrims returning from Mecca (some of whom strongly objected to being photographed), an old Saracenic building with fine gateway, now used as a school, and the Armenian Cathedral with the stump of a tree said to have been planted by St. Paul. Not far off was the waterfall of the Cidnus, the pool being still pointed out where Alexander the Great caught his fatal chill. A fine mosque at Adina was visited after some difficulty. From thence a trip was made to the famous Cilician gates and a plateau beyond, where both Cyrus and Ibrahim Pacha had made encampments.

Brechin Photographic Association.—February 19.—A set of slides, lent by Messrs. Thomas to show the advantages of using the anti-halation plate, were exhibited. A comparison between the results from an ordinary plate negative and an anti-halation plate negative showed a very striking difference. The whole set of slides were excellent specimens, and were highly commended by the members. Some specimens of members' work were also on exhibition at the same meeting. Platinotype seems to find favour with a few, but printing-out paper is a general favourite, and seems likely to hold its own against all the other papers combined.

Kilmarnock and Ayrshire Photographic Society.—February 15, Mr. J. Mack Wilson, Senbank, Prestwich, presided.—Mr. Thomas Haddow, the representative of the Blair Camera Company, gave a most interesting description of the various articles manufactured by the Company. Among other things, he showed a panoramic camera, which seemed to be a perfect masterpiece of mechanism. It appears not to be a toy, but a practical instrument in the hands of a good worker. Mr. Haddow showed how films were quickly and successfully developed, and at the close gave a description of the new photography. On the motion of Mr. Boyd (Grammar School, Kilmarnock), a very hearty vote of thanks was accorded to Mr. Haddow for his demonstration.

FORTHCOMING EXHIBITIONS.

1896.

March 6 ..... *South London Photographic Society. Hon. Secretary, Charles H. Oakden, 30, Heuslowe-road, East Dulwich, S.E.

„ 6 ..... *Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

NEGATIVE PAPER.

To the EDITORS.

GENTLEMEN,—Allow me to add my mite in favour of negative paper for roll-holders. I have never had such success with celluloid film in spools as with negative paper. My experience has been confined to the Eastman Company's roll-holder negative paper and celluloid film. The negative paper was very rapid, and was very simple to work with. As far as I remember, the "stripping films" of the same Company came out some time afterwards. The paper negatives gave good prints without grain. Rendering them transparent with vaseline or oil quickened the printing, but, with plenty of light and plenty of time, was not necessary.

The Woodbury tissue, Vergara's film (Fröedman's (?) patent), and the celluloid film, all gave hopes for a transparent medium suitable for use in roll-holders; but it seems likely that, up to the present, the negative paper has been the best of all for this purpose.—I am, yours, &c.,

55, Parliament-street, S.W. S. L. DOBIE.

DENSITY IN NEGATIVES.

To the EDITORS.

GENTLEMEN,—In your issue of February 28, we notice a report of some remarks made by Mr. Chapman Jones wherein he is credited with having said: "Messrs. Hurter & Driffield had stated that the density of a negative could not be varied by the time occupied in development; but this he considered was contrary to general experience."

We can hardly believe that Mr. Chapman Jones can have made such a misstatement, and we imagine that a printer's error has probably crept in. May we, however, ask you to allow us to state that we have never said anything of the kind, and that we quite agree with Mr. Chapman Jones that such a statement would be "contrary to general experience."—We are, yours, &c., F. HURTER & V. C. DRIFFIELD.

OPERATORS' GRIEVANCES.

To the EDITORS.

GENTLEMEN,—"Aboveboard's" letter on "Operators' Grievances," published in your issue of February 28, I would commend to all employers in the profession. I am afraid they were ashamed to advertise the salary; and, with regard to "keeping specimens," this game will, I am also afraid, never be stopped. The best way is not to send any, or, if any are sent, to draw the pen across, and so render them unserviceable to the "gent" who would like to exhibit them in his show-case.

In your issue of February 21, you also print a long letter, "A Warning to Assistants," exposing what is, without doubt, a great injustice. I am not quite sure that grumbling is a duty, but stating reasonable cause of complaint is a different matter. There is no doubt this cheap firm stands alone in its treatment of assistants, which is the talk of the profession.

In my long experience (some sixteen years), I cannot recall any such treatment. I sympathise with "A Victim" and others in the employ of this firm. In my firm (Curzon & Co., Kensington) we receive the best of treatment, working hours nine till six. We close on all Bank Holidays, and are given three days in the summer, quite a contrast to the cheap firm.

Can any photographer expect to do "a good business" on wet, dull, or foggy days, and does this cheap firm expect to improve matters by bullying their assistants?

"Cosmos," in a recent number of the JOURNAL, asked "does the photographic profession rank with a 'drapers' shop?'" In this case, I should say it does.—I am yours, &c., FAIRPLAY.

London, W.

THE RECENT LIMELIGHT COMPETITION.

To the EDITORS.

GENTLEMEN,—Referring to Mr. Scarborough's last letter, why he declines to meet me in a fair public contest, in which everybody interested can judge for himself the merits of the respective jets, and objects to each party working his own jet, I am at a loss to conceive; and must therefore leave your readers to form their own opinions upon the subject, which, judging from the orders my manufacturers have already received, is highly satisfactory to me.

In conclusion, I can only say my offer to contest in public, contained in your issue of February 21, is still open for Mr. Scarborough's acceptance, failing which, I shall continue, as heretofore, to assert that my jet was the winner of the recent competition, as every one well knows that none but the loser in a contest is first to suggest it should be considered a draw.

Here, so far as I am concerned, this correspondence closes. Thanking you for your kind indulgence,—I am, yours, &c., G. W. GWYER, JUN.

Bourneville, Sneyd Park, Bristol, March 2, 1896.

MR. INGLES ROGERS'S EXPERIMENTS.

To the EDITORS.

GENTLEMEN,—In your issue of Feb. 21, I observed certain remarks on page 117 relative to the so-called eye pictures, and it may interest you to know that, after very careful experiments in this direction, I have absolutely failed to obtain any result whatsoever. I have used ordinary and isochromatic plates of extreme rapidity, and, in order that the retinal image might be as strong as possible, used a sixteen-candle lamp against a dark background as the object to be gazed at.

The trial was made not only by myself, but also by a friend who has considerable power of concentrating his vision, gained by long-continued microscopic work, and, without doubting what Mr. Ingles Rogers reports as to his own experiments, I am bound to say that, so far as my experiments have gone, there has evidently been something lacking. Whether this something is psychological or physiological it is not for me to say.—I am, yours, &c., W. D. BORLAND, F.C.S.

Beacon Lodge, Green Street Green, near Dartford, Kent, February 26, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

SHUTTERS; LENSES.—CAROLUS. 1. The second shutter named would be the better for your purpose. 2. Yes to both questions.

REMOVAL OF SILVER STAINS.—IGNORAMUS. Messrs. Marion & Co. sell a solution for that purpose.

GAN-OE, G. SCORAH, "JUSTICE," "DORSET," "ZERO," ALEX. GRANT, R. BENNETT, H. COHN, "ONE OF THE RANK AND FILE," and others. Received; in our next.

BROOKS' COLLODION EMULSION.—DOUBTFUL. Yes; Mr. Brooks still supplies his collodio-bromide emulsion. His address is Laurel Villa, Wray-park, Reigate.

DEVELOPER.—THOS. ROGERS. Probably a metol-hydroquinone developer best meets your requirements. Try the formula given on page 849 of the ALMANAC for 1896.

CAMERAS FOR PROCESS WORK.—SELVYT. These are, we believe, supplied, specially made for the purpose, by Messrs. Mawson & Swan, Penrose & Co., and other firms.

ELEMENTARY BOOK ON THE ELECTRICAL PART OF THE NEW PHOTOGRAPHY.—J. R., C. E. PAYNE, OBLIGED, SUBSCRIBER. Such a book is referred to under "Our Editorial Table" last week.

SHOW-CASE.—S. J. W. There is no means of preventing the rose tint of gelatino-chloride paper from fading when put into the show-cases. It is the action of light that discharges the colour—not the atmosphere.

SOLUBILITY OF FERROUS SULPHATE IN ALCOHOL.—R. T. W. says he has tried to dissolve some ferrous sulphate in alcohol, and asks why he failed to do so.—In reply: Ferrous sulphate is, we believe, insoluble in alcohol.

GAS TUBING.—W. SIMONS. If the indiarubber tubing has become soft and lets the gas through, it should be replaced by new for the sake of safety. There is no effectual way of repairing the tubing when it gets in the condition mentioned.

SPOTS ON NEGATIVES.—PHILIP PARSONS. The only cause we can suggest is that your hypo is contaminated with some impurity. Try a fresh sample. The spots cannot be removed without reudering the negative more useless than it is.

COLOURING TROUBLES.—C. C. BATES says: "We should be much obliged if you could inform us whether there is anything used so as to colour Solio prints, as we have tried several things, and not yet been successful?"—See reply to "F. J. G."

STRIPPING NEGATIVES.—C. ALLON. The best way to prepare the glass—wet-collodion process—for stripping the negative from is to rub it well with powdered talc—French chalk. The film will then strip easily when dry. Of course, no substratum must be used.

TRANSPARENT SPOTS ON NEGATIVES.—BEGINNER says: "I send you a negative with small transparent spots on it. Can you tell me the cause?"—The spots are caused (1) either by dust being allowed to settle on the films; or (2) air bubbles in the developing solution. The remedy is obvious.

COLOURING PRINTS.—F. G. writes: "Can you tell me, through the medium of your Answers column, of any varnish sold to prevent water colours running and sinking into the surface of P.O.P. gelatine prints?"—We know of no such varnish, but probably, if the prints were sized with a weak parchment size, it would suffice.

CHARGES.—HISTORIC. There are no stated charges for such work. Every photographer fixes his tariff according to his own ideas. We should say, if you make your usual charges for that class of work, and so much in addition for the negatives, say, about as much extra for the negative as you charge for the copying, it will be about right.

SCABS ON NEGATIVES.—W. G. S. (Rangoon). The "scabs" appear to us to be in the nature of fungoid growths, doubtless accelerated by climatic conditions. The crystalline appearance was probably caused by the presence of hypo, which could not have been all washed out. Sorry we cannot help you further than to suggest the trial of another brand of plates.

CINEMATOGRAPH.—C. SPURRIER says: "I have been to Marlborough Hall, Regent-street, and seen the wonderful living photographs on the screen. Can you tell me how they are produced? I think I should like to try my hand at producing them."—Messrs. Lumière's cinematograph is described and illustrated in this JOURNAL for February 7 (LANTERN SUPPLEMENT).

BLOCKING OUT SKIES.—NIKO writes: "Will you kindly inform me which is the best medium for colouring or darkening matt varnish for the purpose more particularly of blocking out skies?" &c.—Any of the coal-tar colours, soluble in spirit, may be used for tinting matt varnish; but the best thing for blocking out skies is the black varnish sold for photographic purposes.

LIMELIGHT PICTURES.—"TABLEAUX VIVANTS" asks: "Will you be good enough to give some information to guide me in photographing some *tableaux vivants* by limelight, whole-plate size, rapid plates? What exposure must I give?"—It is impossible to say, as all will depend upon the power of the limelight, and the distance it is away from the *tableauz*. Better make a trial exposure beforehand.

COLLODIO-CHLORIDE PRINTS.—BEGINNER forwards us some collodio-chloride prints from which portions of the film have been apparently scratched away. He asks the reason.—You have handled the films far too roughly in the washing operations. Collodion films are of a tender nature, and will not stand the comparatively rough treatment to which albumen prints may be subjected with impunity.

ELECTRIC LIGHT.—ELECTRODE. The experience of London photographers is that it is much cheaper to get the current from the mains than to set up an installation to generate it. As a matter of fact, most, if not all, those who had gone to the expense of engines and dynamos abandoned them as soon as they could get the current supplied to them. That, we think, answers your queries in a practical way.

RUBBER SOLUTION.—T. BROADE. You ought to meet with no difficulty in making a solution of indiarubber if you use the right kind of rubber. Get some masticated rubber and dissolve it in benzole; nothing more is needed. You may, perhaps, find it more convenient to get a tin of indiarubber solution at any of the rubber warehouses and thin that down with benzole; it is less trouble than dissolving the rubber, as that takes time.

THE NEW PHOTOGRAPHY.—"X," who states that he is a constant reader of this JOURNAL, and would like to know how to take "photographs" of the bones of the hand, says his knowledge of electricity is so small that he does not know how to proceed. Would we tell him?—"X" may be a constant reader of the JOURNAL, but he is not a careful one, otherwise he would have seen that, in our last number, we had an article giving the information he desires.

PATENT APPLICATION.—SNAP-SHOT writes: "I notice in your JOURNAL that ——— has patented a hand camera with a changing arrangement, the idea of which, I have reason to believe, he has borrowed from me. I distinctly remember mentioning it to him some months ago. How can I find out if this is so?"—Wait until the specification of the patent is published. This will probably be nine months from the date of application. You can then purchase it for eightpence, and may possibly discover that the idea is not yours after all.

LENGTH OF STUDIO.—BEGINNER. A convenient length for a studio is about thirty feet. That allows of the use of lenses of such foci that the camera may be placed at such a distance from the sitter that good and pleasing perspective is secured and the portraits are free from the distortion caused by the camera being too near the subject.

ADDING FIGURES TO GROUPS, SPOTTING.—F. R. W. writes: "1. I have two orders in hand of groups taken by myself, and have to insert another figure from a copy into the groups. Could you kindly tell me the best way to make the insertion? 2. Could you also tell me of a reliable spotting medium for spotting enamelled prints, either before or after enamelling?"—In reply: 1. Space is too limited in this column to give any useful information on this subject. Articles on it will, however, be found on pages 18 and 82 of the volume for last year. 2. Most of the dealers supply colours specially for the purpose.

CAMERA LENS.—E. MOORE asks: "1. What should be essential in a camera 15×12 for all-round work, studio or field, and consider cheapness? 2. And the most suitable 15×12 lens and focus for groups and architectural work."—In reply: 1. It should be strong, and have all necessary movements, *i.e.*, double swing back, reversing frame, rising, falling, and sliding fronts; be preferably of the "square" form. Better study the various forms advertised in the ALMANAC, wherein you will find a camera mentioned that meets your ideas as regards price. 2. One of the rapid rectilinear or anastigmatic type of about sixteen inches focus.

ENLARGING WITHOUT A CONDENSER.—ENLARGER says: "Would you kindly tell me if I could use an incandescent light for enlarging, without a condenser? My idea is to get a box, and cut a hole at one end, and fit the back of my camera (a half-plate one) to it, the negative being placed in the dark slide. The light would be inside the box with a strong reflector behind it. Do you think that this will answer?"—In reply: If our correspondent will place inside a large box a concave reflector with a whitened surface, and an incandescent light on each side of it, and the negative and objective axially thereto, enlarged images may be projected without the interposition of a condenser.

DISTEMPER, COPYRIGHT, VARNISH.—BACKGROUND asks: "1. The way to make distemper for painting backgrounds. I have a plain one that has become spotted through getting damp. 2. Can I register the photograph of a testimonial of which I have enclosed a rough, unfixed copy. The photographs round the testimonial, and also the design for same were done by me? 3. Can you give me recipe for making negative varnish that can be put on with a brush?"—I. Mix together whiting and lamp-black to the tint required with water so as to make a thick cream, then add enough melted double size, of the oil shops, to form a thin, tremulous jelly when cold. It should be applied cold. 2. Certainly you can. 3. Any of the varnishes, the formulæ for which are given in the ALMANAC, can be applied with a brush if desired. But it may be advantageous, if they are so applied, to make them a little thicker by using less solvent.

ACID BATHS.—BOHEMIAN says: "Kindly inform me what is the best method to adopt in order to keep the sensitising bath neutral—silver bath, fifty grains to the ounce of water? My gold bath also becomes very acid. What is a good remedy? It is made as follows:—Twenty-five grains of acetate of soda with a grain or two of bicarbonate. I to some extent lessen the acidity of the silver by mixing a little carbonate of soda with ammonia. Also, for the same purpose, I dissolve a small piece of ordinary soda in the gold bath, and then boil and filter. I am doing batches of 300 to 700 prints a day."—We cannot account for the baths getting so acid unless it is from the paper used, in which case there is no preventive except changing the brand of paper. A little bicarbonate of soda shaken up with the silver bath each time it is returned to the bottle after use, will, of course, neutralise the acidity. The same treatment will also neutralise the toning bath.

DARK PRINTS.—H. J. G. TORNOE (Bergen) writes as under: "May I ask your most valuable answers to the following questions: 1. I throw the albumen silver prints, which are too deeply printed, among the silver residue before toning. Is this the right way to act, or can you inform me of an altogether reliable method for reducing them before toning? 2. I have a large number of over-printed albumen silver prints, which are toned and fixed. Will you advise me to reduce them, and what would you prefer for such a reduction, thinking also of the permanence of the prints? 3. Which degree on Warnerke sensitometer do you prefer a gelatine dry plate to have for average landscape work when there is time enough for exposing?"—In reply: 1. The wisest course is followed, and we should advise its continuance. 2. The same applies again. Over-printed pictures are not worth the trouble of reducing, if time, uniformity of tone, &c., are a consideration, as they are with all professional photographers. 3. About fifteen or sixteen.

QUICK EXPOSURES.—E. B. says: "Can you inform me how it is possible to take a photograph in one four-hundredth part of a second? I refer to such photographs as one sees of men jumping, &c. With the exposure tables I work by, I find that such a subject in bright sunshine, midday, in June, with extra rapid plate, would require one-sixtieth of a second. Of course this may not be exactly right, but it means more than six times the exposure mentioned above. I may add that the stop I calculated for is *f*·6. I can only suppose that, under these circumstances, the subject is much under-exposed, and, if so, is it rectified by a long development in a weak developer? If so, what would a long development mean, minutes or hours?"—In reply: We can only say that tolerably well-authenticated exposures of one four-hundredth of a second, and very much less, have been given without producing *very* much under-exposed results. The essentials are a really rapid plate, a good light, large aperture of lens, and a quick-acting shutter. If the exposure is somewhere near the mark, prolonged or abnormal development is by no means imperative. Let our correspondent try the experiment under the conditions stated.

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EX CATHEDRÂ.

We have not yet heard that any of our professional readers have added to their businesses a department for the production of Röntgen photographs, although we have no doubt that, if an enterprising man were to make this kind of work a speciality, he would speedily receive profitable patronage from hospitals, medical men, and others. Within the last few days it has come to our knowledge that innumerable applications for the services of a "new photographer" have been fruitlessly made, and that a desire unquestionably exists to know where a fractured or malformed limb, or a portion of the human frame, can be promptly shadowgraphed. The photographer who, in Central London, and within easy reach of the various hospitals, is first to cater for the patronage of medical men may possibly build up quite a lucrative business in the production of "shadowgraphs."

* * *

We congratulate Alderman Thomas Keig, F.R.A.S., Photographer, Douglas, Isle of Man, on his appointment to the position of first Mayor of the newly incorporated Borough of Douglas. Mr. Keig is, we believe, the oldest-established photographer in the island.

* * *

Mr. R. Bennett, of 19, Brunswick-street, Liverpool, writes: "I am desirous of obtaining information as to photographs of any of the ancient water and wind flour mills existing in various parts of the country. Most of these are sufficiently picturesque to have gained the attention of many a tourist wandering with his camera through the country, and also many a professional photographer. Will you allow me to inquire from your readers as to the whereabouts of any of these mills, as I am anxious to obtain as many photographs of them as possible? These I purpose using (as illustrations of a style of mill which has now passed away) in my *History of British Corn Mills*, which is almost ready for press."

* * *

We learn that one of the attractions of the Leeds meeting of the Photographic Convention of the United Kingdom will be an Exhibition of the photographs arranged by the President-elect, Mr. H. P. Robinson. The National Association of Professional Photographers will attend the meeting. This is as it should be. The Convention deserves to be better supported by professional photographers than has hitherto been the case, and we hope that the gathering next July will show some improvement in this respect.

* * *

The Editor of the *Camera Club Journal* has, it appears, been taken to task by some of his readers, who are dissatisfied with the photographic *pabulum* provided in that monthly publication, and in the last number of which we find the following plaintive retort: "We are sorry to hear that some of our members are complaining of the 'Notes and News' of the past few months. They are said to be 'twaddle,' also extremely ungrammatical, and even 'piffle,' whatever that may be. In explanation—not excuse, please—we would mention that, as it was difficult to make bricks without straw, so is it not easy to find anything especially exciting to write about photographic matters, more especially as there is no rush of offers of assistance; further, a good deal of the 'twaddle' consists of Club matters, which those who are not constantly in the Club may care to know if they take any interest in its existence and welfare."

"As regards the faults in composition, these may be explained by the fact that the last three *Journals* have been edited and written in a train, and a L.B. & S.C. train at that, which is *almost* an excuse as well as an explanation. If only some of the Club wits would contribute to our columns, what a brilliant little paper our *Journal* would be! but they modestly prefer the *rôle* of critics, and demand the bricks while withholding the straw."

* * *

How far these complaints are justified it is not our business to inquire, but we may, perhaps, be permitted to offer our sincere sympathies to the sorely harassed gentleman whose gratuitous labours on behalf of his fellow-clubmen have met by such an unpleasant form of recognition. The new number of the Club's *Journal* contains some interesting papers and discussions which have been already reported in our columns, and the following fanciful description of what is generally supposed to occur when a film of silver bromide is exposed to light transmitted through a lens and then developed. The author is Captain W. de W. Abney, and the passage occurs in a lecture on exposure and development.

* * *

"Supposing we have a substance which is composed of four atoms, two of which are respectable members of atomic society, restricting their oscillations to the very merest movements, while the other two are much more 'fly-away' and exuberant in their spirits, and perform a valse rather than a stately minuet. It is quite conceivable, nay, it is probable, that one of the last-named pair, receiving an impetus from some outside motive power, would increase the circle of his performance to such dimensions that he would quit his original group of dancers, and find himself gyrating amongst some other group in a neighbouring portion of the ball-room; and there he would perhaps find those parties to whom he would join himself performing quite a different kind of step, and he would himself perforce join in it.

* * *

"The original group, when this volatile gentleman had quitted it, would consist of three only; there would be the two sedate ones, whom we may look upon as the chaperons, and the other volatile one, who would be unhappy at the exit of his partner. The former, that is to say, the chaperons, taking heed of the fate of the fourth, would restrain the third and make him more circumspect, and the party would remain as it was. If, however, the outside motive force continued to act upon the unhappy volatile gentleman, it is quite within the bounds of possibility that he, too, would gradually become in better spirits, and would leave those two antiquated old ladies in the corner, and, gradually increasing his bounds, would eventually gyrate off to some other neighbouring group, and the chaperons would now be left alone and inseparable; no outside invitation will move them one from the other.

* * *

"It may, however, happen that the comparatively quiescent group of three are removed from the influence of the outside invitation altogether, and they imagine themselves safe from further casualty to their group. But they may be doomed to disappointment. A party may appear on the scene seeking to make up a new set, and the volatile number three, being but little tempted to stay with the old fogeys, darts away, joins a new combination, and is kept apart from them entirely."

We heartily compliment Captain Abney on the verve and humour he has imported into the consideration of such a normally dry and solemn subject as the disruption of silver haloids by light, and in all seriousness beg to suggest that this lucid, if somewhat startling and unaccustomed, method of appealing to our old friend the meanest (photographic) capacity is one that admits of expansion and wide adoption. We do not know whether the grumbling members of the Club quoted above consider Captain Abney's similes either "piffle" or "twaddle;" they are certainly plain and understandable, which a good many impressive photographic lucubrations that do not fall under the displeasure of the unsparing critics of the Camera Club frequently are not.

* * *

Arrangements are in progress for the delivery, under the auspices of the Affiliation of Photographic Societies, of six lectures on photography with the chromium salts. The lectures are to be delivered on Friday evenings at the rooms of the Royal Photographic Society, 12, Hanover-square. A wide and, in parts, neglected field of photography is embraced by the subject of the lectures, which, we hope, will be well attended. It is to the credit of the Affiliation of Photographic Societies that the two lectures on photogravure, given under its auspices by Mr. Dennison three years ago, gave a marked stimulus to this process.

FINE DEFINITION WITH LENSES AND COARSE GRAIN IN PLATES.

With all the improvements that have been made in gelatine plates, both as regards sensitiveness and general excellence, there is still one quality which seems, to a great extent, to have been ignored or, at least, largely overlooked by plate-makers, namely, the texture of the image the plates yield. In some plates the grain is so coarse that it is very conspicuous even to the naked eye. During the past year or two, however, some manufacturers have given attention to the subject, and are producing plates which have a far finer grain than those of the past; yet there is still room for greater improvement, even in the best of them. It used to be considered, and generally accepted, that extreme rapidity could only be obtained at the expense of coarseness of grain; but great coarseness of grain is not a necessary concomitant of rapidity, for some of the fastest plates we have tried have possessed a remarkably fine grain; though, fine as that grain was, it would not for a moment compare with that of a wet-collodion negative.

Wet collodion cannot, however, be quoted as being of a standard of fineness, as, in this process, the size of the grain will be in a great measure dependent upon the developer used and the condition of the bath, collodion, &c. The finest grain obtainable with wet collodion is with pyrogallic acid developer, a simply iodised collodion, and a neutral bath. Then, when all are in perfect condition—a condition difficult to maintain—the image will have a decided claret tint, and will appear to be perfectly homogeneous, even under considerable magnification. The finest of all photographic grains, however, is that yielded by the albumen process; here the image partakes more of the character of a stain than an actual deposit of silver. Let any one compare one of the old Ferrier stereoscopic slides with a negative on a gelatine plate, and the difference between

the texture of the two will, indeed, be surprising to those not familiar with it. Let us now turn to lenses.

Considerable difference of opinion seems to exist as to whether some of the new forms of lenses—those for which a flat field is claimed—yield the same fine or miscroscopic definition as do some of those of the older forms—the triplet or the doublet, known as the symmetrical, rectilinear, &c. Those who take the negative view are those who work principally with wet collodion for process work where microscopic definition is essential, particularly with the finest ruled screens—150 lines to the inch, for example. This topic was commented upon by that excellent little trade brochure, *Process Work*, a little while back. Those with the opposite opinion work mostly with gelatine plates. Without going further into this subject, there is no question whatever that the new lenses, or at least those by makers of repute, do yield infinitely finer definition than any of the quick plates now in the market will render. Therefore it is manifest that modern plates do not do justice to the optician's skill.

It may be asked, Where, if the plates will not respond to the definition of the lens, is the advantage of the lenses that yield the microscopic definition it is alleged that some of the older forms do, and which is said to be absent in the newer ones? Very little, if any, for general work, even if the case were as affirmed by some, particularly when that little advantage is counterbalanced by important ones in other directions, more especially when the final result is an ordinary paper print. Further: even supposing the plates were capable of the finest rendering of, say, a process screen 150 lines to the inch, the paper would be quite inadequate to its reproduction. It is a noteworthy fact that paper prints often appear quite sharp, though they are made from negatives that are decidedly unsharp, or those of a very coarse and granular nature. The case would be materially different were the prints on glass, say, by the albumen process, for example. We allude to this matter merely to show that the merits of a lens should not be judged of from a paper print, as is frequently done. It is that which has helped the sale of cheap and inferior lenses, so many of which are now in use by amateurs of the modern school.

Many enlargements suffer materially from the granularity of the image in the original, although that may have been taken by the most perfect lens. In speaking of coarseness of grain, only that in rapid, and moderately rapid, plates is under consideration. That in the special photo-mechanical plates and lantern plates is quite a different thing, as it more closely resembles wet collodion in its texture. What is required is as fine a grain in rapid plates as we get in those just referred to. Then we shall be able to avail ourselves to the full of the optician's skill.

Some Further Peculiarities of Glass.—According to Sigmondi, if a small quantity of protoxide of iron be added to glass in the course of manufacture, it so modifies it as to permit plenty of light but very little heat to pass through. But this effect would seem to have been already discounted in practice, for the green colour of ordinary window glass is owing to the presence of iron. When there is an excess of iron in plate glass "metal," for instance, and the colour is objected to—manganese is added to destroy it. If too much manganese be added, the glass has a tendency to become pink or pale purple after much exposure to light.

The Great Star Chart.—Some particulars regarding this great international project, now in course of realisation, were given by the Astronomer Royal at the last meeting of the Royal Astronomical Society. A special staff under Mr. Hollis has been organized for the work, and already 130 of the plates taken have been measured. It is calculated that in a year's time 180 plates can be measured, and 160 reduced. Reckoning the section of the heavens apportioned to Greenwich, 150,000 stars will be examined, and the whole section completed in about six years. If the other observatories work at the same rate, that period will see the completion of the gigantic catalogue of between two and three million stars.

The Röntgen Rays.—The investigations still continue in every quarter, and results in many directions are notified. In last week's *Nature* much space is given to Professor Salvioni's application, Professors Oliver Lodge and Andrew Gray pointing out that the discovery is Röntgen's own, Salvioni having merely applied it. But, upon perusal of the latter's paper, it is evident he claims no originality, for it is plainly said, "In this there is, of course, nothing new which could not have been deduced from the original experiments of Röntgen." The novelty—if, indeed, it is so—consists merely in making use of known facts to design the arrangement. We have thus further evidence of the need of caution in receiving reports through the non-scientific press of any developments of the "new light." Instead of iristoscope, as first announced, Professor Salvioni terms his instrument a cryptoscope. He used sulphide of barium as the fluorescent screen, but says it may with advantage be replaced by the original cyanide of barium and platinum of Röntgen.

Le Bon's Dark Light.—We have already described the results obtained by this experimentalist, and the failure to repeat them experienced by M. d'Arsonval; but it is undoubtedly the case that similar effects have been obtained by others, and at the last sitting of the Paris Academy an explanation was given of the contrary results in different hands. In M. Le Bon's last paper (see *Comptes Rendus*, p. 386), he states that the results are obtained from the light of an ordinary lamp transformed into dark light by its passage through a copper plate. His experiments are performed in duplicate, *i.e.*, a blank half of the plate not subjected to the dark rays is treated simultaneously with one that has been subjected to their influence, so that any effect of so-called stored light is shown to be non-existent. He has been working at this subject for two years, and was gradually able to eliminate all factors tending to prevent the stated results from being produced.

He encloses the plate in a sheet of copper, and finds the dark rays pass through equally well though ten sheets of paper, sufficient to arrest ordinary light, be interposed; the plate develops up just as though no other obstacle intervened. Also discs of iron several centimetres thick failed to arrest the dark light in the slightest degree. We find ourselves, he says, "in presence of a mode of energy which is no longer light, ... neither is it electricity, since electricity in its known form does not produce such effects. Dark light must probably be looked upon as a new force in addition to the small number already known."

Let us now look at the explanation of the contradictory results. We find ourselves in the presence of facts which seem to indicate that we have to deal with a real discovery of possibly great importance. Messrs. Lumière were unable to repeat M. Le Bon's results, and this explanation was given at the succeeding sitting of the Academy (March 2). To put the matter briefly, M. Henry had already found that fluorescent bodies emitted radiations capable of passing through metals, and M. Becquerel described a series of experiments showing the activity of fluorescent bodies. M. d'Arsonval remarked that yellow-green fluorescence gave active, and violet fluorescence inactive, radiations. M. d'Arsonval, in his unsuccessful results, used plain sheets of copper, M. Le Bon covered his copper with glass, that was all the difference. The glass employed by the latter proved to be a kind that gave the yellow-green fluorescence and this seems to be the whole secret. Lead glass was inactive.

THE GAS-CYLINDER REPORT.

The report of the Committee appointed by the late Home Secretary to investigate the conditions under which compressed gas cylinders are tested, filled, and used has been issued. The following are some impressions based upon the conclusions at which the Committee have arrived:—

1. That the safety of properly constructed cylinders filled with compressed gas, by a well-regulated system, has been thoroughly established.

2. That the Committee who took an immense amount of trouble, by investigation and experiment, to arrive at solutions of one or two vexed questions, found the results were of negative nature only.

3. That the strength of cylinders made from suitable material was fully established and more than equal to the strain put upon them in testing, filling, and in use.

4. That 120 atmospheres is a perfectly safe pressure for the recent type of cylinder, made in conformity with the weight test, and properly annealed, the steel used being of a prescribed ductibility.

5. That only two fatal accidents have happened with cylinders containing compressed gas, due to causes that general regulations would have prevented. They are the Bradford and the Fenchurch-street explosions.

6. That the Bradford is put down in the report among those "Explosions probably due to bad cylinders," and the Fenchurch-street under "Explosions of mixed gas or vapour due to improper compressing arrangement."

7. That the other explosions mentioned were "Explosions due to pure carelessness or causes such that no general regulations would have prevented them;" or else with carbonic acid or ammonia cylinders, and so are outside the consideration of lanternists.

8. That the five explosions of pressure gauges or reducing valves attached to gas cylinders are not likely to be added to, now that it is understood that oil should not be used when testing the former or in lubricating the latter, and making joints sound.

9. That the statement in the report, "The limelight is steadier and more manageable than electric light for such purposes" (theatres), will have to be modified when the results obtained at such places as the Adelphi Theatre, the Empire, and many other places, are fully appreciated.

10. That, considering the output of one Company in London was 100,000 cylinders in a year, the number of accidents is very small, and not nearly as many as due to steam; in fact, the report says, "The number of accidents, considering the extent of the trade, has been very small, and the number of fatalities has been small also."

11. That certain lay papers, talking of gunpowder and cordite, and comparing certain quantities of such explosives with compressed mixed gas, is rather apt to disconcert the public unless the reason for making the comparison is fully stated, and that such explosives were used to test the strength of the cylinders.

12. That, when a cylinder stands the explosive force of cordite, equal to three tons to the square inch, without bursting, it shows how strong it is.

13. That the Committee think that cylinders of the new type, and fulfilling the conditions laid down, are quite safe to be carried by railway without being packed or covered. G. R. Baker.

THE PHOTOGRAPHIC OPINIONS OF ULYSSES McGILP.

II.

Where the Amateur Draws the Line.

To lift up amateurs, or such of them as desire to be exalted, above the odious middle-class art, is surely no unnecessary labour. The task is, none the less, an herculean one, for, sad be it to say so, England — middle-class England — is still unsympathetic to pictorial art. Now, unless nurtured by sympathy, the seeds of great possibilities, which are in some few rare beings, fail to germinate, or if they get so far, the seedlings die for want of warmth and light. This indifference of art is common knowledge to photographers, for we all know that nothing is less attractive, as a subject for a lecture, or demonstration at our societies, than that of art. The British amateur will cheerfully dive into the most puzzling intricacies of optics, chemistry, or of fatuous empiricism, but he draws the line at futile, superfluous art.

Miserable Boredom.

I mind me well, how an artist member of a photographic society prepared a charmingly illustrated art lecturette, to be read to his fellow members. Result: no one but the Hon. Sec. turned up. Since the above, a society having ostensibly for its *raison-d'-être* the cult of pictorial art, held an exhibition, and invited a well-known artist-speaker to give an address upon the subject which the society was formed to encourage. The greatest local big-wig was in the chair, supported by the next greatest. Almost as soon as the man of art began to speak, the chairman buried his face in his hands, closed his eyes in abject dejection, and presented a picture of utterly miserable boredom. The other big-wig kind of looked "what ill have I done to be thus punished?" The large assembly of ladies and gentlemen, after listening *for about two minutes*, conversed together with great noise and volubility. As for the artist-lecturer, having shouted himself nearly hoarse, he, in about ten minutes, gave up the useless effort, and was insulted with the usual insincere platitudes.

I need hardly say that the above assemblage was a thoroughly representative middle-class one, and—I am sorry to add—included a not inconsiderable percentage of photographers; of course, neither the upper class nor the lower class would be guilty of such lack of natural courtesy.

Where The Professional Scores.

This, then, the material out of which one has to try and make a first-class amateur photographic picture-taker. Why, it may be asked, confine these remarks to the amateur? Because natural selection will always be the strongest force in moulding the professional. Let me, while the two branches of photographers are being mentioned, warn the amateur that to compete with the professional in his own peculiar province is mere folly. Topographical photography has been, and is, so well done by those who use special appliances, and who are in constant practice, that the amateur's results cannot approach the above. Walk into the first dealer's you come to, and look through his album of local views; then, if you can, try and recall one amateur who has such a collection of his own "topographies,"—it is almost impossible to name a single one. Any how, one—or even two—swallows make no summer.

It is just the same with portraiture. Bergheim and Annan are, I know, amongst us, and I mind me of one or two others who, like Gulliver, tower above the Lilliputians; for all which the amateur may as well confess defeat.

Next favourite is, of course, snap-shotting—a sport which seems to be in a very sickly condition. Most people are nauseated by the unnatural, displeasing, Paul Pry photographs with which the hand camera has flooded the the land. Here, again, that beastly industrious, and conspicuously enterprising person, the professional, has already cut in and forestalled the amateur in what he would, some of these days, no doubt, have secured, to his undying fame.

Imaginative, but Discreet.

From the foregoing, it will be gathered that there is not much choice of subject left to the amateur desirous of photographic distinction. None the less, there remains ample space for his abilities to expand, and no field is at present less completely occupied than that which Dr. Emerson has been for some time quietly delving in.

The field referred to is the ennoblement of the rare and simple. The patient studying of the less vulgar, the less obvious phrases of natural facts, objects, and aspects; their presentment in refined habiliments, spun and woven by the controlling hands of an imaginative, but discreet, artist.

All which may sound difficult to attain, but is not necessarily so. If you are a shire cart horse, why, *certes*, you cannot beat a Donovan in the Derby; but, being built upon the right lines, it needs but training and striving for all to run a good race.

The Praiseworthy Error of Reticence.

And you may read, or examine much and long before you shall find better hints than in *Marsh Leaves*. I do not, of course, approve

everything in it; do not praise those portions of some of the etchings which, personally, I am unable to admire. But, if some seem, in a measure, erroneous, it is that wholesome error, the error of reticence. Every one who mixes much with painters is aware that the chief difficulty with a picture is to know when to leave off. In nearly all cases, at least, as regards all but the first flight of painters, pictures, or portions of them, are carried too far.

Too far for the painter's knowledge, for his manual skill, for the harmonious renderings of his subject, too far for the inclusion of suggestions and mystery, without which pictures are but poor planes of paint.

It is just in his ability to resist the temptations of carrying his pictures too far that Dr. Emerson teaches his fellow-amateurs an invaluable lesson. Looking at most of his etchings, thus *A Waterside Inn*, or *The Lonely Fisher*, one is not filled to satiety with an over-rich slice of nature. The impression is rather comparable to that maybe intangible, but yet exquisitely, delightful pleasure of the Havannah, or the choice Château Lafitte. And gazing there arise musings and imaginings which the stimulated fancy responds to; and instead of dwelling upon blades of grass, and almost each individual hair upon the kine which crop the herbage, we feel the whole sentiment conveyed by the translation of an impression.

Tantrums of Light and Shade.

Just one thing more which the book, *Marsh Leaves* suggests, namely, our leaders would—apart from all question of the comparative merits of sharpness and fuzziness—do well to learn the lesson set them to avoid taking Nature when she is as it were posing for her portrait. We have, I suppose, got beyond the stage where horses are expressly arranged in pools, or droves of cattle or of sheep obviously planted upon given portions of the pasture land; and such-like devices are almost out of date amongst our leaders. None the less are we being constantly plagued with impossible—or, if possible, undesirable—melodramatic and violent presentments of Nature when she is giving herself airs and graces, or flying into tantrums of light and shade.

At such times she is herself bad enough, but our end-of-the-century amateurs usually manage to make matters even worse by "Over-doing Termagant." To such Dr. Emerson administers a needful corrective, one which is withal very pleasant to swallow. His prescription runs somewhat as follows: Take of the every-day, all-year-round scenes and circumstances which surround you; render them without straining or over-reaching, but with your utmost nicety of adoption and adornment, then you may hope to illustrate many unconsidered trifles of pearl and diamond, which are being continually passed by, in order that Exhibition walls may display sensational travesties.

PHOTO-MECHANICAL NOTES.

There have been several pronouncements of late on the theory of the half-tone process which deserve the attention of all thoughtful workers. Most notable, perhaps, was the article of Count Vittorio Turati, in the *Photographische Mittheilungen*, and his later notes in the *Photographische Correspondenz*, on "A New Photo-mechanical Half-tone Principle." I fail to see any thing new in the *principle*, but the effects secured are decidedly novel, and the article has attracted wider attention than it would otherwise probably have done, by reason of the remarkable examples which accompanied it. I venture to say that the author's description of his methods is hardly comprehensible to the majority of those who have read it, and it is very difficult to follow out the principle by the explanations given. I do not suggest that the author has intentionally omitted any essential details, but the description is certainly not applicable to all the examples given. The author says: "The method of working is as follows: Expose the plate first with a very fine central diaphragm, then expose the original almost sufficient with a small, round, central diaphragm, and now close the whites by a short exposure with a diagonal cross $=a$, according to the first law."

The first law is stated to be (1) "the distance of the diaphragm centres from one another." But nothing is particularly said in the article as to the use of more than one opening in the diaphragm, except where it is said, "The only alterations introduced were the distance of the screen and the construction of the diaphragms according to whether single or double projections should make their appearance." Here, however, we get a clue to the author's meaning and method.

For an ordinary half-tone, without any abnormal effects, he used the method described above. The small stop gives the shadow dots; the larger one the high lights; then, to produce the joining up, he uses a × stop. The effect of the latter is to produce the overlapping at the corners in the high-light dots, whilst having little effect on the shadows.

For determining the size of the cross, the distance of the centre of two screen openings from one another must be estimated, and each diagonal of the cross must have a proportional length, determined by the extension of the camera. An easy way of determining it without having recourse to calculation is to draw the cross within the round or square diaphragm one would work with in the ordinary way for the half-tone process. The use of a cross diaphragm has been known for a long time previous to the publication of this article, and also the use of large and small diaphragms in the course of one exposure. The formula, too, for mathematically calculating the distance of screen and size of diaphragm is in accordance with the generally accepted pinhole image theory. So far, there is nothing new in principle.

A close examination of the enlargements from Count Turati's negatives shows that he has made considerable use of other shapes of stops, and of more than one aperture in the diaphragm. In some cases I should imagine he has perforated a second smaller aperture towards the margin of the diaphragm, and has given part of the exposure with this, completing the time with a slit aperture of such a length as would join the image of the two apertures where projected in the highest lights of the negative. This slit aperture, and the corresponding round or square apertures, could be disposed vertically or horizontally to the margins of the screen, or could run parallel with the lines, giving different effects in either case. Further variation could be attained by having two slits, one narrower than the other, and inserting them in the lens in different directions, and giving one a longer exposure than the other. An L-shaped stop, cut in the diaphragm in such a position as to connect at its extremities a preceding diaphragm with two openings, has also apparently been used. Still another effect may have been attained by taking a square stop and running out two diagonally opposite corners. An elliptical stop, with its major axis disposed parallel to the lines of the screen, would give a chain-like line of dots. Where a secondary tiny dot appears in the centre of the white squares, the exact method used by the author is rather difficult to determine. I question very much whether it could be attained by a diaphragm with double opening, but have not thought of testing it this way up to time of writing. I know, however, it can be done in cameras having a screen adjustment from the outside, by first exposing with the larger aperture ordinarily used, then putting in a small stop and shifting the screen a slight degree towards the sensitive plate.

The changes which could be rung on the use of diaphragms in this manner are almost illimitable, but the operator who endeavours to repeat Count Turati's results, without entering into the mathematical calculations which the author has laid down, will probably get the reverse effect to that expected, and probably some abnormal appearance which will utterly unfit the negative for any use.

In his second article in the *Correspondenz* the author describes a much simpler method involving no calculation. He recommends an adjustable screen-holder, and focussing the shape of the dot by observation with an eyepiece on a clear glass focussing screen, on which a cross is scratched for the purpose of setting the eyepiece. This I know is a very successful method, and it is really marvellous to note the way in which the dots vary with the distance when a determined shape of diaphragm has been inserted. In many exposures, with various sizes of screens, cameras, and lenses, I have found the observed dot to accurately coincide with the dot developed in the

negative. Moreover, the distance of the screen determined by this focusing is always proportionate to the stop inserted, so that we obtain two factors correct, and the chief point left to consider is the exposure.

In *Das Atelier des Photographen* Dr. G. Aarland has an article on "The Theory of Half-tone Negative-making," in which he emphasises the statement that "up to the present nobody has pointed out that the whole of half-tone work rests on the fact that the full diaphragm aperture acts only in the middle of every screen aperture, whilst at all other points only a corresponding, and frequently very small, part of the diaphragm aperture is actually used."

The answer to that may be given, that nobody with any practical acquaintance with the work would think of making such a statement. It might have passed muster a year or two ago, but it is now so absurd that this author contradicts it with his own formulæ and diagrams. He goes on to say that "the size of the diaphragm must be most accurately adjusted to the size of the screen aperture, to the distance of the sensitive plate from the diaphragm, and to the distance of the screen from the sensitive plate." This is perfectly correct, and is the formula decided upon by all writers on this subject; but, in attempting to explain the practical application of this, he endeavours to show that the lines of the screen stop the marginal rays from the diaphragm, and only allow the central part of the cone of light to pass. If this is the way Dr. Aarland, or his friend Herr Granowski, works, then. it is obvious that, in spite of his formula, the diaphragm aperture is too large or the distance of the screen too great, for the accepted practice is to place the screen at that position where it will allow the point of the cone of light, which has for its base the diaphragm opening, to pass through the screen aperture without obstruction. If calculation shows that such a distance would be too close for convenient working, then we must reduce the diaphragm aperture. To work in the way the author has indicated would simply be to waste time by having to prolong the exposure, because a considerable proportion of the effective light would be wasted by being obstructed by the lines of the screen. The deduction that "half-tone negatives are actually formed by over-exposure" is not, therefore, surprising. Yet, later on, the author instances an exposure of "from one to one and a half minute" in "a fair light." We must confess we have never heard of such an exposure being successful in the practice of half-tone work; but then he manages to get his screen as close as $\frac{1}{2}$ mm. to the sensitive plate, which is hardly possible in ordinary practice. The whole article is, in fact, a curious mixture of sound theory and bad practice.

A more recent Continental contribution to the theory of the subject is an article by W. Weissenberger in the *Photographische Correspondenz* for January. Herr Weissenberger is one of the chief operators at the Imperial State Paper Works, St. Petersburg, and therefore speaks from a practical standpoint. He shows by means of diagrams that the geometrical relation between the shape of the stop and the shape of the dot is practical as well as theoretical; and, quite contrary to Dr. Aarland's theory, he emphasises the fact that this geometrical shape is produced by the projection of light rays from the extreme corners and margins of the stop. This writer, however, illustrates the peculiarity that, with the usual forms of stops (square or an equilateral triangle) and the ordinary position of screen lines the diagonal shape is not strictly in accord with the stop, although it is quite easy to see from the diagrams given that the dots follow geometric laws. For instance, triangle stop gives heptagonal or heart-shaped dot; square stop (with screen diagonal) gives octagonal dot; but, if the screen openings were equal in shape and position in relation to the diaphragm, the shape would be geometrically similar, no matter how far the plane of the diaphragm be removed from the plane of the screen.

Continental theorists (with the exception of Herr Weissenberger) seem to scout the idea of diffraction having anything to do with the half-tone dot formation. The experiments of Mr. Max Levy, backed up by Mr. F. E. Ives, ought to convince any waverers on this point. These investigations have shown that at a certain screen distance the "pinhole image" of a small circular diaphragm aperture (giving approximately parallel rays) appears smaller and brighter than the screen aperture itself, while at other distances it becomes diffused, or its centre even darkened.

Mr. Ives (in his article in the *American Annual of Photography*, 1896) says it has been his practice "to expose for the shadows with a small circular diaphragm aperture, the screen distance being such as to give the smallest and brightest image of this aperture upon the sensitive plate, and to expose for the high lights with a diaphragm aperture of several times greater diameter. In this way a sharp, fine dot is always obtained in the shadows, even when the high lights have to be closed up by a supplementary exposure with a large diaphragm aperture. It is evident, then, that, although the modern screen process was brought to its present degree of perfection on the basis of the pinhole image theory (a good working hypothesis), diffraction really plays an important part, actually improving the 'pinhole image,' or injuring or almost destroying it as the conditions are made favourable or unfavourable."

Though so much has been said and written on the theory of the half-tone screen, I do not think that the subject is entirely exhausted, and we may look for further light on this interesting subject, and for discoveries which will greatly influence the future of the half-tone process. To give an instance, hardly anything has been done, viz., in the use of the screen for photographing from life and from still objects. There is an immense field here, and it is not an impossible one to develop, but it will not be by existing methods.

WILLIAM GAMBLE.

UNIFORMITY IN HALF-TONE NEGATIVES.

OFTEN has the embryo half-tone worker sighed for definite information on certain points—the distance of the screen, size of stop or its shape, wet or dry plates, and, no doubt, several other things usually regarded, more or less, in the nature of search—should he purchase or otherwise acquire, in a more or less direct way, any information presumed to be authentic, it may increase his happiness until he fails, and taps a second source, to find that it contradicts all his previous notions, and he tries a third; and, being assured that both previous instructors are quite wrong, his bewilderment is complete.

This difference of opinion amongst process workers is well understood, and it is not uncommon to find operators engaged in the same establishment following widely different courses, and attaining the same end. The writer well remembers being told by Obernetter, at Munich, that, if he required a new hand for his collotype department, and the choice lay between an experienced collotype worker from another establishment and an intelligent but raw youth from the litho press who had never seen a collotype plate, his instant choice would be the untried hand, as the litho printer would, from sheer ignorance, follow blindly the instructions given and example set, and succeed; while the practical man, from another school, would not be content, unless he followed, or attempted to follow, his previous experiences, unmindful of different materials, different methods, and different circumstances, and his attempt to "cross" the two was always attended by disaster. In the early days of any process, each man has worked alone, and followed out his own ideas, and a dozen in as many different parts of the country may have as many methods of attaining the same end, each founds his own school, and the old saying with regard to one man's food being poison to another is again exemplified. In nothing more than half-tone is this seen, and there need be no wonder, for where a certain desired modification is required, and there are several ways of doing it, by rule of thumb, as undoubtedly the production of half-tone negative making is mostly done, operators will vary in their opinions and methods.

There are so many factors in half-tone work that rules can only be made to meet individual cases; but the following lines are written under the impression that they will enable any one who will take the trouble to conduct a few experiments to carry out their operations in a much more systematic manner than the writer has yet observed practised in any studio that he is acquainted with. The data given throughout must only be taken as illustrative, and it is not expected that the identical figures will prove of value, except that they may form a starting-point, and in that light they must be regarded.

Let the operator set up three copies, all, say, silver prints by the same process—passable, but varying: the first one rather "flat," or "tender," as artists would describe it; the second one a normal or quite satisfactory print; the third under-exposed and heavy, but all

with equally pure high lights. Having decided upon a distance by which the plate should be separated from the screen—if the latter be 150 lines to the inch, we will say about $\frac{1}{16}$th of an inch—if that is decided upon, stick to it. Having selected the lens to be used, stick to that also. In the interest of uniformity, it is desirable that a uniform light is used, that one may feel that the experiments are as reliable as possible. Let the copying board be at a fixed spot, say, eighteen inches from, not merely the lamp, but the arcs, and note that the craters of the lamps are always in the same relative position. These are suggestions only; but, whatever the exact conditions most convenient or adopted may be, make them hard and fast. Returning to our three prints—and it may be pointed out here that the use of three prints as described may save time in the experiments, as one has three chances of success, and much may be gained by studying the negatives of three copies made at one exposure—place them on the copying board side by side, copy them all together on one plate, and let the copy be the size of the originals, which may, of course, be *cartes* or even less, use a stop of *f*-22, say, and, as a matter of convenience, a circular aperture of iris form, exposing for ten minutes. Having exposed and developed your plate, it may be found that one of your copies has given an ideal negative for half-tone, the high lights just sufficiently closed, and the dots of the shadows of just the correct strength. If such should prove the case with one copy, then *it cannot be so in the others, for the one success will assure two failures.* Presuming it is the central or second copy of which the negative is perfect when examined under the glass, then, in the case of copy No. 1—the flat one—this will be found correct in the high lights, but the dots in the shadows will be found too large from over-exposure, and the negative worthless, while in the No. 3 copy the high lights will also be correct, but the dots generally will be found too weak, as a result of under-exposure. Assuming, as before mentioned, that the negative of No. 2 print is correct, *note the proportion of the stop to the extension of the camera from the lens centre to the ground glass.* The aperture of the stop may be found to be $\frac{1}{25}$th, $\frac{1}{30}$th, $\frac{1}{40}$th, or $\frac{1}{50}$th of the camera extension, or anything else above, below, or between these numbers; whatever it is, note it. Should the camera be extended thirty inches, and the stop used be one inch in diameter, we will express the value of the stop as *e*-30. This will conclude experiment No. 1. And we will now proceed to copy the three prints again, but on this occasion reducing them to half the original size. Be it noted, the only factor we alter is the position of the camera and the necessary reduction of the extension. If we again use stop *f*-20, and again expose for ten minutes, our central copy will be found with the dots too large in the shadows, the first copy will be "bunged up," and No. 3, while better in the shadows, will have the high lights too much closed up, these results following over-exposure. Practical men know how to overcome this, and, if our desire is to secure the central print, the same exposure may be given again by placing the screen nearer the plate, reducing the stop, moving the light to a greater distance, or shortening the exposure; or, if the operator is using two stops, he may increase the time he uses the small stop, and shorten the time of exposure through the larger one: any of these devices may be resorted to, and sometimes more than one is used at once. What the writer believes to be the simplest method, and that easiest calculated, as opposed to guessing, is when the camera is suitably extended for the reduction. Take note of the extension, and with the iris diaphragm *create a stop of exactly the same proportion to the extension as used in the first experiment*, viz., *e*-30, and with that stop give exactly the same time as in your first trial—ten minutes.

Again a further reduction may be tried this time, say to one-fourth, when the camera is again adjusted; again create a stop *e*-30, giving the standard ten minutes' exposure, and on examination the three negatives produced at *e*-30, with the same exposure, will be found identical in their suitability for process and differing only in size. They will require an identical period of time to print, and the same to etch. For all practically identical copies, this stop *e*-30 and ten minutes' exposure will give, irrespective of enlargement or reduction, uniform negatives, and, *if the result is once right, it will always be right.*

Now, returning to our other copies, just as the centre negative has been in each case identically good, so the first and third copies will in each negative appear identically bad. We will deal with the "flat" or first copy. Here we want to increase the contrast, and this may be done on the basis of any of the variations previously mentioned. In our previous experiments we have seen that the high lights were right in this No. 1 copy, but the shadows too heavily dotted; now if we cut down the exposure, but use the same stop *e*-30, it will put right the shadows, but the high lights will suffer and not be sufficiently closed. Therefore we alter the stop by *enlarging it to, say, e*-20, *and shorten the exposure to, say, six minutes.* The high lights may then be found closed up to the required extent and the shadow dots reduced to the exact requirements. Of course, in practice, to ascertain the exact *e* value of the stop and exposure required may need several experiments, but, *once ascertained, they are universal* for similar "flat" copies.

The "hard" or "heavy" copies that need cutting into now remain to be dealt with; we have seen that, exposed under our first condition, the negatives, while correct in the high lights, were too weak in the shadows, and, having retained our three copies all along, we shall observe that, when we corrected our working to suit the "flat" copy, our heavy one became more unsatisfactory in the negative than before, for, while the high lights became nearly solid, the shadows became blanks. Although apparent, we may point out that, if we fall back upon our original stop, *e*-30, and, instead of giving ten minutes, increase it to fifteen, we make a distinct gain in the shadow, but lose on the high lights; and, to meet this case, we must *reduce the stop to, say, e*-40, this will cut up the shadows more, and, by *extending the time, say, to fifteen minutes*, will bring up the high lights to the required density, and, having ascertained once for all the stop *e*-value and time of exposure for heavy copies, this becomes, as before, universal for similar copies.

In actual practice, place your copies in three classes, which will be treated somewhat as follows:—"Flat," *e*-20, exposure six minutes; good copies, *e*-30, exposure ten minutes; "hard," *e*-40, exposure fifteen minutes. It will be found convenient to have marked and numbered upon the side of the tailboard of the camera suitable divisions, numbered from the centre of the lens to the back, and to have a corresponding and proportionate scale engraved on the lens mount, both drawn out from actual measurements, and numbered proportionately to the tailboard.

Having focussed, whatever the scale of reduction or enlargement may be, with regard to the copy, one has then simply to observe what particular number of the scale upon the tailboard the ground glass falls nearest to, and the operator is immediately and infallibly told what stop is required to give a satisfactory result without the slightest calculation. He simply turns his iris to a number corresponding to the position of the ground glass upon the tailboard, which, if the calculations have been made aright, means that the iris aperture is equal to *e*-30 (or whatever proportion of the extension you may find it necessary to adopt). Instead of having three scales for the three grades of copies, adopt the course of using, say, one or two numbers higher on the iris than indicated on the tailboard when the copy is weak, and one or two numbers lower when heavy—the exact difference must be the outcome of your fundamental experiments.

EDWIN C. MIDDLETON.

RONTGEN'S PHOTOGRAPHY OF THE INVISIBLE.

[Journal of the Society of Arts.]

DURING the past month every one has heard of the photographic discovery of Professor Röntgen, of Würzburg. The word photography signifies drawing by the aid of light, and while all are familiar with ordinary photography, in which common daylight or artificial light is employed, it is because Professor Röntgen has not used ordinary light, and because the results he has obtained have, in some respects, been very extraordinary, that his discovery has caused such a considerable sensation throughout the world.

In this connexion it is interesting to ascertain exactly what we mean by the word "light." Every tyro in science is acquainted with the classic experiment of Newton, in which the white light proceeding from the sun, or from an electric lantern, is split up by means of a prism into the familiar colours of the spectrum.

However, the spectrum that is visible to the human eye does not by any means comprise the whole of the radiations that proceed from such a source of light as the sun or the electric arc. At one end of the spectrum, beyond the dark-red portion, there are rays of radiant heat which do not affect the optic nerve, but which can be felt by other nerves of our bodies, and the existence of which is easily made apparent by means of a delicate thermometer. At the other end of the spectrum—at the end of greater refrangibility, as it is called—beyond the extreme violet, there are dark waves called the ultra-violet rays, which, though invisible in themselves, have strong chemical effect upon sensitive photographic films, and can be made actually visible to the eye by means of the fluorescence that they excite in certain substances. For instance, if the spectrum is thrown upon a piece of paper which has been painted with a solution of sulphate of quinine, the violet end is greatly prolonged, and it is thus possible to see much that previously was totally invisible. As is well known, light consists of vibrations of the ether that fills all space. There can be slow vibrations of large wave-length, as it is called, and there can be rapid

vibrations of infinitesimal dimensions. Some of the long waves experimentally demonstrated by Hertz and Oliver Lodge, which, in accordance with Maxwell's electro-magnetic theory, are identical in every particular, except size and frequency, with those with which we see, may be miles in length, and vibrate but a few hundreds of times per second. At the other end of the scale, the length of waves of ultra-violet light can only be measured in millionths of an inch, and their rate of vibrations in billions per second.

The fact is that, without special appliances, the human optic nerve takes cognisance of but a very minute portion of the radiations that proceed from any luminous body; and, though the word "light" in popular phraseology is restricted only to such radiations as affect our eyes, in a more scientific sense it includes much more.

The photography of the invisible presents no novelty. For years astronomers have employed the photographic plate for the purpose, by means of the cumulative effect of long exposure, of recording the existence of stars which, owing to their enormous distance from the earth, are quite invisible to the eye, even through the most powerful telescope. It is also years since Captain Abney succeeded in the very delicate experiment of photographing a kettle of boiling water in a perfectly dark room, by means of infra red heat radiations that proceeded from the kettle itself. Again, photographs of both invisible ends of the spectrum have been common enough in connexion with researches in spectrum analysis.

The radiations employed by Professor Röntgen in his photography appear, however, to differ considerably from any in the spectra of luminous bodies, as also from those produced by Hertz. Indeed, at present it is uncertain whether the Röntgen rays are of the nature of light at all. They have the pecularity that, unlike light, they appear to be incapable of refraction by a prism or lens, or of anything but very imperfect reflection. Their not being amenable to refraction, at any rate to an appreciable extent, may be explained on the supposition that they consisted of very long waves similar to those of radiant heat; but against this theory we have the fact that they act upon photographic films far more strongly than do the latter, and also that even a delicate thermopile gives no evidence of their producing a rise in temperature. It seems more probable that they more nearly resemble the ultra-violet rays, though here the absence of refraction can only be explained on the supposition that their wave-length is so exceedingly short as to be comparable to the size of the ultimate atoms. It has been suggested that, whereas ordinary light consists of what are known as transverse waves on the ether, waves similar to those existing in the sea, in which a particle of water moves vertically up and down at right angles to the direction in which the wave is travelling, the Röntgen rays consist of longitudinal ether waves more closely resembling the waves of sound, in which a particle of air vibrates backwards and forwards in the same direction that the sound is moving. Or, again, it is conceivable that the Röntgen rays have no resemblance to light, sound, or other wave motion at all, and that they are more nearly akin to the original and abandoned corpuscular theory of Newton, and consist of particles either of very attenuated matter or of the ether itself moving in rectilinear streams at enormous velocities.

A. A. C. Swinton, A.M.I.C.E., M.I.E.E.

(To be continued.)

WATKINS' DEVELOPING COMPETITION.

[Report by Alfred Watkins.]

In this report I endeavour to set down the actual results attained by competitors, and not intrude my own opinions or experiences, which are added in parenthesis where explanation seems necessary.

It will be remembered that two halves (A and B) of one exposure were to be developed by different methods. The main conditions were that the corresponding high lights were to be equal in density, and that unexposed strips of the halves should show no fog or equal fog. The results to be judged by prints; and therefore, in speaking of density or gradation, I refer to the evidence of prints from the negatives.

When I speak of "change of gradation." I mean that A and B coincide as regards density in one tone, other tones being unequal. It is obvious that, when all tones in A are denser than all corresponding tones in B, no change of gradation is proved by the prints. I have recorded change of gradation in each case where it occurs, whether the conditions are complied with or not. Seventeen competitors sent in thirty results.

To sum up: Four competitors—Messrs. B. J. Edwards, Ben Edwards, Sterry, and Channon—have shown decided change of gradation without fog. Three out of these used, for the one half, strong (8 grains or over to ounce) pyro developers; in two cases, with much bromide; in one case, Mr. Sterry, with minimum bromide (½ grain to ounce). The fourth competitor (Mr. Ben Edwards) used, for the two halves, pyro developers identical, except that one contained bromide, and the other little or none. (This means of attaining change of gradation is important. I exhibited an exactly similar example at the Photo Club, when Judges' decision was given. It must not be presumed that variations in amount of bromide will always give change, or that it can be done with all plates. It may perhaps be described as developing a slow plate with developer at the verge of fogging point, and it is a question whether this principle was not followed by all four competitors.)

All the four competitors used comparatively slow plates, and three (Mr. Sterry being the exception) stopped development of one-half before lowest tones were out (a procedure which always secures change of gradation).

Messrs. B. J. Edwards and Channon's examples all bear a glossy surface on the strongly developed halves (not the other halves), also sixteen (ammonia carbonate half), but no other examples do.

Mr. Channon's examples (glossy surface halves) all bear a number of spots of metallic silver, quite absent in corresponding halves. (Does not this give a hint of a reducing action with these developers, for reduced negatives have a similar glossy surface? In looking over my own experiments, in which identity of gradation has been secured, in comparing strong with weak developers, I find no instance of a glossy surface. I need scarcely add that I am not doubting the genuineness of Messrs. Edwards and Channon's examples, but think this might give a clue to the abnormal developing action.)

To deal with the remaining competitors, three (228, 203, 45) have shown change of gradation with unequal fog present.

One competitor (23) has secured change by previous soaking in bichromate of potash.

Two competitors (59 and 52) show absolute identity of gradation with different developers.

Two others (35 and 37) only escape identity of gradation by a mere shade, 37 being metol compared with pyro.

Halation.—The power of obviating this by development is proved by Mr. Sterry (the most striking example), and Messrs. Channon and Marriage. The two first prevent halation with strong pyro, the third with the aid of ammonium carbonate. Mr. Sterry proves that bromide is not necessary for this purpose by using only ½ grain to ounce, but he uses *no alkali*, except that which may be in the sulphite of soda.

Detailed Results.

(The figures indicate grains to ounce.)

No. 250. B. J. Edwards.—Edwards landscape plate, exposed 2, 4, 8, 16, 32, 64, 128, 256 seconds to candle at three feet. *A*, pyro, 1½; metabisulphite, 1½; carb. soda, 18; bromide, ⅛; appeared one minute, developed four minutes. *B*, pyro, 8; metabisulphite, 8; carb. soda, 76; bromide, 16; appeared three minutes, developed nine minutes. Result: a very decided change of gradation, highest tones, equal, *B* the shortest gradation, no fog, lowest tones all developed out in *A*, but not in *B*.

No. 249, 251. B. J. Edwards.—Conditions and results same as above. (There is no over-exposure in above examples, the highest tone has received no more exposure than the sky in a correctly exposed landscape.)

No. 246. Ben E. Edwards. — Edwards's med. iso. plate, subject, gradations. *A*, Edwards' pyro and potash, three minutes. *B*, as above (used second time) with bromide added, six minutes. Result: decided change of gradation, not so great as 250, *B* the shortest gradation, no fog, lowest tones developed out in *A*, but not in *B*.

No. 54. J. Sterry.—*A*, pyro, 9½; sulphite, 24; bromide, ½; appeared in twenty-five minutes, developed seventy-five minutes. *B*, metol, 3½; bromide, ½; carb. pot., 12; sulphite, 36; image flashed out, developed ninety seconds. Subject: four gradations all in period of over-exposure amounting almost to reversal. Result: marked change of gradation, *B* all tones much alike and buried in halation, *A* free from halation and fair gradation, no fog in either; Cadett ord. plate.

No. 6. J. Sterry.—*A*, pyro, 12; sulphite, 48; bromide, ½; appeared in sixteen minutes, developed forty minutes. *B*, rodinal, 12; sulphite, 48; bromide, ½; appeared thirty-four seconds, developed twelve minutes. Subject: four gradations, full exposure. Result: marked change of gradation, *B* great halation in upper tones, *A* free from halation, no fog in either; Cadett ord. plate.

No. 230. H. J, Channon.—Ilford ord. plate, landscape subject. *A*, pyro, 10; sulphite, 40; bromide, 6; ammonia, 3; appeared in twenty minutes, developed twenty-six minutes. *B*, pyro, 1; sulphite, 4; bromide, ½; ammonia, 2; appeared eighteen seconds, developed 105 seconds. Result: highest lights do not quite match, but there is a marked change of gradation, no fog, slight halation in *B*, none in *A*, both under-developed negatives.

Four other similar examples by same competitor, none matching in high lights, but all showing marked change in gradation. One of them, remarkable for *A*, taking three hours to develop, 6 grains of bromide being added, no more change of gradation in this example than in the others. All Mr. Channon's examples, except one pair, are thin, the lowest tones in *A* not being developed out.

No. 44. W. Ridler.—Four gradations, Ilford Empress plate. *A*, 1 grain pyro soda, with ½ grain bromide at temperature 70°. *B*, 10 grains pyro soda, with 4½ grains bromide at temperature 50°. Result: no change of

gradation shown, all tones in *A* being denser than corresponding in *B*, *A* very yellow image which visually shows change of gradation, but not when tested by printing.

No. 228. C. A. Brightman.—Cadett ord. plates, landscape subject much under-exposed, half second exposure for sky only. *A*, metol. B, pyro ammonia, 1½ grains. Result: density of sky equal, an apparent change of gradation, *A* having foreground detailed out, and in *B* detail is not developed out. *A* slightly fogged, *B* not.

Nos. 252, 253, 254. Same as above, but exposure one, three, and four seconds. Result: no change, all tones slightly denser in *A*, which has slight fog.

No. 255.—Same as above, but exposure five seconds. Result: slight apparent change, but *A* is fogged, not *B*.

No. 58. A. Thickett.—Four gradations, Ilford spec. rapid. *A*, glycin. *B*, eikonogen. Result: no change, every tone of *B* slightly denser than *A*.

No. 60. W. Richardson —Landscape subject, Ilford iso. plate. *A*, pyro ammonia, 2. *B*, pyro soda, 2. Result: no change, *B* being denser throughout, no fog.

No. 59. W. Richardson.—As above. *A*, pyro soda, 1. *B*, pyro ammonia, 1. Result: identity in all gradations, no fog.

No. 16. E. Marriage.—Architectural subject, Edwards's med. iso. *A*, pyro soda with ammonium carb., 3½; bromide, 1. *B*, pyro soda, 2¾; bromide, ½. Result: no change of gradation shown, *B* denser in all gradations, slight fog and halation, *A* no fog or halation.

No. 35. Miss Silk.—Interior, Imperial ord. plate. *A*, velox (normal). *B*, velox slightly diluted and 1½ grains bromide. Result, no change. *A*, a shade denser throughout than *B*. No fog.

No. 203. W. Robbie.—Both *A* and *B* badly fogged and thin. Slight change.

No. 204. W. Robbie.—Landscape, Gem Plate. *A*, pyro ammonia. *B*, metol.

No. 205. As above.—*A*, metol followed by ferrous oxalate. *B*, metol. Results of last two no change, all tones shade denser in *A*, but plates too stained for reliable test.

No. 45. G. Cosser.—Four tones, Ilford ord. *A*, pyro ammonia. *B*, pyro soda. Result: both badly fogged; *B*, outrageously so, change of gradation.

No. 23. G. R. Turner.—Ilford iso. med.; scale of tones. *A*, pyro soda, *B*, soak in 3 grain bichromate potash for six minutes, then developed hydroquinone. Result: change of gradation, upper tones equal, no fog. This is, of course, a reduction process, but interesting.

No. 52. O. J. Slater.—Landscape, Ilford ord. *A*, pyro soda, "weak in pyro;" *B*, pyro soda "strong in pyro." Result, absolute identity in all gradations. No fog.

No 231. S. E. Kelf.—Landscape. *A*, pyro soda. *B*, pyro metol. Result; two exceedingly faint negatives of about equal density and gradation, the united density of the skies far less than the fog in unexposed slip of No. 45.

No. 221. G. Wilkes.—Interior, Marion film. *A*, hydroquinone and eikonogen. *B*, Hydroquinone. Result: no change proved. *A* is much denser in high light, but lower tones are also dense. Attempt was made to match the shadows, fog about equal.

No. 22*b*. G. Wilkes.—Four tones, old Carbutt film. *A*, hydroquinone and eikonogen. *B*. hydroquinone. Result; no change. All tones in B denser than corresponding tones in *A*. No fog.

No. 37. G. L. Wood.—Four tones, Paget xxx. *A*, pyro, 2; bromide, ½; carb. soda, 12, in saturated sol. of soda sulphite; appeared in three minutes, developed 12 minutes *B*, metol, 2; bromide, 2; carb. soda, 24, in saturated sol. soda sulphite; appeared in 1½ minutes, developed 24 minutes. Result: absolute identity in three upper tones, but lower tone of *A* a mere shade the denser. Slight fog in both, a shade the most in *B*. Both halves same colour.

NOTES FROM THE WEST OF SCOTLAND.

For many years a desire has existed among a large number of professionals in the West of Scotland, that some association should be formed, having for its object the prevention of trade abuses and the dealing with many minor matters which so frequently arise affecting the interests of professional photographers.

In the past, several attempts were made to organize such a society, all of which unfortunately, however, proved futile.

We are pleased to note, however, that quite recently such a scheme has taken practical root, and that at a meeting held last week, which was attended by a good number of the professional workers in the West of Scotland, it was decided to form such a society with a membership of masters only. In the meantime Mr. George Bell has kindly consented to act as Secretary, and a meeting will be held at an early date to frame rules and elect office-bearers.

Some misconception seems to exist *re* Glasgow International Exhibitions which are announced, for there are to be two. Readers of The British Journal of Photography must not confound the fixture which has been arranged by the magistrates and town council of the city, and which will be held in Camphill House, situated in the outskirts of the city, with the more important fixture which is to be held in The Fine Art Institute during the months of September and October 1897. The latter will be a very important Exhibition and will include lantern lectures nightly

Mr. William Riddell, late of the firm of Riddell & Rae, St. Vincent-street, Glasgow, starts business on his own account at an early date.

THE W. H. HARRISON FUND APPEAL.

First List of Contributions.

	£	s.	d.
Rev. Chas. J. Taylor	3	3	0
R. P. Drage, Esq.	1	1	0
H. J. Channon, Esq.	1	0	0
W. T. White, Esq.	1	1	0
Rev. F. C. Lambert	1	1	0
Mr. George Davison	1	1	0
Messrs. Illingworth & Co.		2	6
Per The Editor of The British Journal of Photography—Chapman Jones		10	0
	£8	19	6

Our Editorial Table.

The New Photography.

By A. B. Chatwood. London: Downey & Co., York-street, Covent Garden.

Mr. Chatwood's book consists of four parts, Part I. being devoted to a *résumé* of the work of Röntgen, Gifford, and Swinton with the X rays, and Part II. mainly to Ives's system of photo-chromoscopy. Retinal impressions and "spirit" photography, so called, are treated of in Part III. We note that Mr. Chatwood claims to have succeeded in projecting, from the retina, a developable image on to a sensitive plate years before "Dr." Ingles Rogers published his communications on the same subject in a contemporary. As regards "spirit" photography, Mr. Chatwood shows how fraudulent photographs of "spirits" may be produced, and his attitude towards this much-debated matter is that of one anxious to have opportunities of investigating the alleged phenomena. Anaglyphs are briefly described in Part IV. The book, which sells at 1*s.*, has evidently been hastily compiled; but it has been well done, and, aided by some excellent illustrations, is one that will probably make a successful appeal to the general as distinguished from the photographic public.

"Primus" Novelties.

W. Butcher & Son, Blackheath.

Messrs. Butcher, with unceasing enterprise, are early in the field with several useful novelties which are likely to find favour with amateur photographers during the ensuing season.

The "Primus" Indicators.—These, which may be fitted to any dark slides, are designed to obviate the risk of double exposure. They are made in brass, with an ivory moving tablet. They are fitted into the end of a dark-slide frame so that the little spring pro-

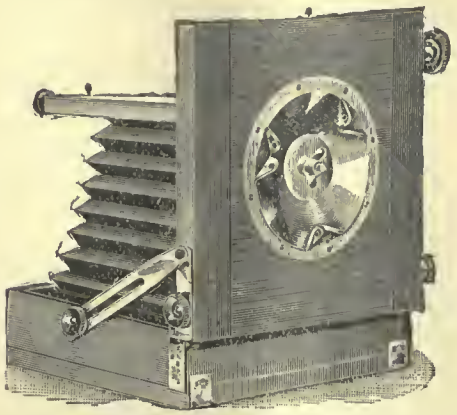




jects into the rabbet, and are held in position in the frame by the screws. In use:—After the dark slide is filled with plates, push the ivory tablet across the opening, so that the word "exposed" is hid from view, then close the shutter of the slide which holds the tablet in this position; immediately the dark slide is opened in the camera, the tablet slips across the opening and the word "exposed" appears.

The "Primus" Turntable and Universal Tripod Head.—This arrangement supplies all the conveniences of a ball-and-socket joint without working loose or slipping at an awkward moment, and also that of the ordinary turntable. It consists of a metal plate similar to an inverted saucer, which is fixed by means of screws to the base-board of the camera, which must be partially cut away in order to receive it. Working close into this "dish," as it may be termed, is a metal disc attached to the dish by means of a washer of large size

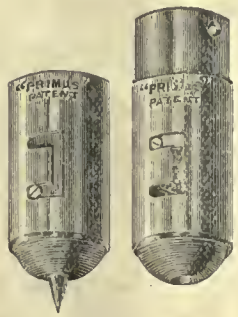
nd a screw. This disc carries the requisite openings into which the egs of the tripod are fitted. A camera fitted with such a tripod



head can be moved about just as thought on a ball and socket joint, with the advantage, that by tightening the binding screw it may be secured rigidly in any position required, and there is no danger of shifting until the screw is released.

THE "PRIMUS" TRIPOD POINT.—This point keeps the stand from slipping on smooth surfaces, and at the same time has no detachable parts to get lost.

It consists of an ordinary point as now used in the field, and a rubber button or half sphere, carried by a brass outer sleeve, which is drawn out over the ordinary point, and is kept in position by a slot



and pin when working upon smooth surfaces. The use of the points prevents the tripod from slipping, no matter how smooth the surface.

The weight scarcely exceeds the ordinary point. They also form a protection to the points when the stand is folded up, preventing their damaging or scratching other articles or the clothing. Being all one, they form part of the stand, and cannot be detached, either intentionally or by accident.

HOW TO ASSIST THE SIGHT.

J. H. Steward, 403 & 457 Strand, W.C.

THIS is a clearly written little pamphlet of some fifty pages, giving, in simple language, a short description of the various defects of vision, with test types and instructions for self-testing. Besides hints on the preservation and improvement of the eyesight, there is a chapter on eyesight in relation to rifle shooting by an old contributor to our columns, Mr. G. R. Baker.

News and Notes.

MR. VALENTINE BLANCHARD has removed to Meadow Lea, Herne-common, near Canterbury.

MR. H. J. BLISS, Grantham, would be glad to hear of any one who has negatives of Moxley Priory or Knareshorough Castle.

MR. WALTER TYLER, of Waterloo-road, will shortly have ready a series of lantern slides, and an accompanying lecture, dealing with Dr. Jameson's Transvaal adventures.

ROYAL PHOTOGRAPHIC SOCIETY.—Photo-mechanical meeting, Tuesday, March 17, at 12, Hanover-square, at eight p.m. *Screens for Process Work* and *A Note on Photogravure*, by Captain Collardon.

NEW CAMERA CLUB FOR SHEERNESS.—At a meeting held at Sheerness on the 7th inst. a club was formed called the "Sheerness Camera Club." The next general meeting will be held on March 21 to consider the rules now being formed by the Committee.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, March 18. Subject, *The New Photography: Notes on the X Rays, with Illustrations by various Workers*, Mr. H. Snowden Ward. Visitors will be welcomed by the members.

WE are sorry to learn of the death of the Rev. H. J. Palmer, M.A., an old and highly esteemed member of the Liverpool Amateur Photographic Association, of which he was formerly Secretary. Mr. Palmer made many contributions to photographic knowledge, which, no doubt, our older readers can recall. He was sixty-one years of age.

THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—The annual general meeting of this Association was called for February 27, but, after waiting for an hour, and insufficient members appearing to form a quorum, it was adjourned to Wednesday, March 4. As there was not a quorum at the adjourned meeting, it was decided to take the business, and ask for confirmation of the Registrar of Friendly Societies. Mr. A. Mackie took the chair; the report and balance sheet (which were sent to all members) were taken as read. A letter from Captain Abney with regard to the proposed transference of the Pension Fund was read, and a resolution was passed that, in order to carry out the suggestion of Captain Abney in his letter of February 15, a new trustee be appointed in his place. Mr. John Spiller was elected to this vacancy. The Committee was re-elected as last year, Mr. E. J. Wall being added to fill a vacancy that had occurred. Unfortunately, the only business of the new Council is to wind up the affairs of the Association, and to arrange for a transfer of its funds to some other body.

Patent News.

THE following applications for Patents were made between February 26 and March 4, 1896:—

CAMERAS.—No. 4110. "Improvements in Photographic Cameras." H. C. PARKINSON.

KINETOSCOPIC PHOTOGRAPHY.—No. 4166. "A New or Improved Means f Exhibiting or displaying to view Consecutive Photographs or Pictures of Moving Objects or Figures." H. W. SHORT.

PHOTOCHROMY.—No. 4244. "A Method of obtaining Light of any desired Colour for the purposes of Chromo photography without the Use of Coloured Glass Screens." C. D. AHRENS.

PHOTOGRAPHIC PLATES.—No. 4286. "Improvements in the Manufacture Photographic Plates of High Sensitiveness to Dark Rays and Radiations." C. O. WEBER.

CAMERA.—No. 4378. "A New and Improved Toy Camera." H. C. BRAUN.

SHUTTERS.—No. 4380. "Improvements in or relating to Shutters for Photographic Apparatus." R. J. S. SIMPSON.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

March.	Name of Society.	Subject
16	Leeds Photo. Society	*The Old Towns of Holland.* W. J. Warren
16	North Middlesex	*Enlarged Paper Negatives.* H. Stuart.
16	Richmond	Display of Members' Slides before the Richmond Athenæum at the College Hall.
16	South London	*A Holiday in North Wales.* Messrs. Allen and Fortune
17	Brixton and Clapham	*Collodio-bromide for Transparencies.* F. Goldby.
17	Gospel Oak	General Meeting.
17	Hackney	Annual Dinner.
17	North Surrey	Lantern-slide Competition for the Wolff Prize.
17	Royal Photographic Society	*Screens for Process Work* and *A Note on Photogravure.* Captain Collardon.
18	Borough Polytechnic	*Carbon Printing.* T. F. Bance.
18	Croydon Camera Club	Sixth Annual Dinner.
18	Leytonstone	*A Lens and its Action.* H. P. Hood.
18	Photographic Club	*The New Photography: Notes on the X Rays, with Illustrations by Various Workers.* H. Snowden Ward.
18	Putney	Annual Lantern-slide Competition.
19	Ashton-under-Lyne	Annual Meeting.
19	Bradford	*Phonographs, Kinetoscopes, and the Kinetograph.* Cecil Wray.
19	Darwen	Lantern-slide Making Demonstration. George Latimer.
19	Ealing	*Composition: The Eye Camera and Light.* J. T. Fairs.
19	Liverpool Amateur	*The Motion of the Horse, and other Animals in Nature and in Art.* Eadweard Muybridge.
19	London and Provincial	*Copying.* H. C. Repson.
19	Oldham	Micro-photography.
20	Bromley	*Development.* S. B. Webber.
20	Croydon Microscopical	Exhibition of Members' Slides, and of Slides of the New Photography lent by A. A. C. Swinton.
21	Birkenhead Photo. Asso.	Demonstration.

ROYAL PHOTOGRAPHIC SOCIETY.

MARCH 10,—Ordinary Meeting,—The Earl of Crauford, K.T. (Vice-President), in the chair.

Four new members were elected, and seven applications for membership were received.

RADIOGRAPHY.

Mr. T. E. FRESHWATER exhibited a number of radiographs produced by means of Messrs. Newton's X-ray focus tube, with an exposure of two minutes. The tube was designed by Mr. Herbert Jackson, of King's College, and had a concave cathode, the rays from which were reflected from a platinum anode on to the plate and brought to a focus.

Mr. T. BOLAS remarked that Professor Oliver Lodge had pointed out that in the case of the X rays the real radiation was from the anode, and not from the cathode.

Mr. SNOWDEN WARD read a note referring to the construction of vacuum tubes. In designing a vacuum tube for the purposes of radiography, three essentials must be borne in mind—(1) Production of a radiation as intense and as concentrated as possible; (2) Avoidance of necessity for intermission in the exposure; (3) Long total life of the tube. Having referred to the two forms of "fatigue" to which vacuum tubes were subject—temporary fatigue causing the latter portion of the period of exposure to be less efficient than the earlier part, and total exhaustion arising from the slow but constant decrease of the amount of residual gas in a tube when in action—he described a tube which he had worked out, with the assistance of Mr. Robins and Mr. A. C. Cossor, and which, he said, seemed to prevent very perfectly the "fatigue" of the glass, and also to provide the ideal form for giving as large a reservoir as possible of the residual gases. The cathode consisted of a convex plate focussing the cathode rays to a point some little distance outside the tube, so that a comparatively small surface of the glass was bombarded, and the tube revolved on its axis, and the excited portion of the glass was thus constantly changed. Mr. E. J. Wall had suggested that the spot on which the cathode rays fell should be a surface convex to the inside of the tube, by which means the X rays generated in the glass would be focussed to a point situated at the radius of the curve of the tube, and the whole of the active rays would then be practically under control, and could be used to cover with fair exactness any desired space.

Mr. CHARLES COSENS, M.R.C.S., read a paper on

MEDICAL PHOTO-MICROGRAPHY.

He showed the apparatus used by his colleague, Mr. Roughton, and himself, and which he said bore a distinct family likeness to that designed by Mr. Andrew Pringle. As an illuminant, nothing was so satisfactory as the lime-light, and the bull's-eye, or paralleliser was in the form designed by Mr. Nelson, which, when placed in the focus of the lamp, threw almost parallel rays into the condenser. As to the position of the condenser, as long as the cone of rays was not cut down too much for the objective in use, it did not matter where the condenser was placed, provided it was central. With regard to the objective, Zeiss' apochromatic lenses, when used with their corresponding eyepieces, approached nearer to perfection than any others, but excellent results could be obtained with ordinary achromatic lenses. Whichever class of lens was employed, he always used the projection oculars. To the micro-photographer dealing with stained specimens, a knowledge of orthochromatics was absolutely essential. In developing a subject in which detail was the most important point to be brought out, he believed pyro ammonia was the most satisfactory agent, while, for contrast, hydroquinone was preferable.

Mr. EDMUND ROUGHTON, F.R.C.S., explained a series of lantern slides of photo-micrographs of bacilli, and medical and surgical specimens, and after a brief discussion, the usual votes of thanks were passed, and the meeting adjourned.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 5,—Mr. R. Beckett in the chair.

In the absence of the Hon. Secretary through indisposition, Mr. FRESHWATER acted in that capacity, and announced the death of Mr. Thomas Samuels, who was well known for his ingenious inventions in the matter of changing appliances, &c.

THE NEW PHOTOGRAPHY.

Mr. FRESHWATER passed round some of his latest shadowgraphs, the sharpness and detail in the tones in which he did not think had been equalled. He did not attribute this success so much to personal skill as to the new focus tube. The subjects included a number of hands and arms containing foreign substances and of more or less surgical interest.

Mr. H. SNOWDEN WARD read a few notes on the new photography. He had hoped to have been able to give in his notes the results of some original observations, but had been prevented from various causes. He had also intended to demonstrate the exhaustion of a tube, but the pump for rapidly doing this had not been delivered, and only a mercury pump for the last stages was available. This was shown at work, however, during the evening. The lecturer quoted abstracts from various sources on the early experiments in connexion with the subject that had been made by Hunt, Richardson, &c. He also described some experiments he had made as to the transparency of the hand to certain strong sources of light, but the outcome was not satisfactory. Lenard had, previous to Röntgen's application, found that the rays from the Crookes' tube were able to penetrate the tube, that they possessed photographic action, and that they passed through certain opaque bodies. Mention was made of a statement by Dr. Shaw to the effect that the cathode rays within the tube had no photographic action, which the lecturer thought very important if correct. With reference to tubes, he considered there was a large field open for both private and business enterprise. Tubes of English and German make of various designs were shown, and the improvements that had been made were pointed out. As regards the appliances, &c., the source of electricity might be the street mains, a dynamo, a battery of suitable form, or accumulators. Mr. Snowden Ward found the latter very convenient, and use was made of them in the present case. A Wimshurst machine had been mentioned, but, up to the present, he had not heard of any success in the results. Wimshurst himself had been devoting some time to the question, but with no better result. He was using a six-inch induction coil, working it at one and a half, which was quite satisfactory. He had produced a plate which would reduce the exposure by one-half.

Mr. FRESHWATER showed the new focus tube, and an exposure was made on one of the member's hands, in which was some broken iron. The position of these pieces was plainly seen with two minutes' exposure, but it was found that less exposure would have sufficed.

Mr. A. HADDON had not heard mention of Hittorf in the paper, who was the first to notice the effect which the cathode rays had on glass.

PHOTOGRAPHIC CLUB.

MARCH 4.—Mr. Frank Haes in the chair.

The Chairman introduced Mr. Walker, of Leeds, to the meeting, and he was welcomed. Mr. Walker is the guiding spirit of the local Committee which has charge of the arrangements for the forthcoming Photographic Convention to be held in his city from July 13 to 18. He is enthusiastic about the success of the meeting, the programme for which is now completed.

About eighty members and friends of the Club were present to hear Mr. Ives's lecture and see his demonstration of

THE PHOTO-CHROMOSCOPE.

The Committee of the Club had arranged with Messrs. Peto & Radford, of 57B, Hatton-garden, to provide the current for an electric arc in the lantern, and this firm are to be congratulated upon the satisfactory nature of their "plant." A fine set of accumulators—in charge of a member of the firm—giving a 20-30 ampère current, and a voltage of 50, worked in an efficient manner throughout the lecture.

Mr. IVES commenced by saying that the photo-chromoscope was an optical instrument which, by the aid of the photographic process, accomplishes for light and colour what the phonograph accomplishes for sound, and the kinetoscope for motion, but with a greater degree of success, and with far simpler and cheaper apparatus. The photo-chromoscope system was based upon the trichromatic theory of vision, and constituted a method of composite colour photography by means of three uncoloured photographic images which constituted a colour record and synthesis by optical superposition of the three images, each illuminated by its appropriate coloured light. The first suggestion of such a method was made by James Clerk Maxwell in a lecture delivered at the Royal Institution, London, May 17, 1861; but Maxwell's lecture appeared to have been totally forgotten for a space of thirty-three years, during which time the idea had been revived by others, and for years was credited to two Frenchmen, Ducos du Hauron and Charles Cros. The process could not have been carried out successfully when first proposed, because the photographic plates of that time were not sufficiently colour-sensitive; but, even after the discovery of means for producing colour-sensitive plates, no real success was achieved, even experimentally, until 1888, when the lecturer pointed out and demonstrated the necessity for using quite different colour filters for the negative process and for optical synthesis. The photographs must be made through colour filters adapted to secure action by definite mixtures of spectrum rays, in accordance with colour-mixture curves similar to those of Maxwell, but the synthesis must be accomplished by means of simple colours only. This fact, although of vital importance, had been totally overlooked by Du Hauron, Cros, Lippmann, and others, who had tried to realise successful processes of composite colour photography. According to the official report of Maxwell's lecture, he, too, made his photographs through the same colour filters that he used for synthesis; but there was reason to suspect that his lecture had been inadequately reported, and that he did not really make this mistake.

By the aid of some beautiful lantern experiments, the lecturer demonstrated the properties of light and colour, and their relation to the photographic process. The means of securing the photo-chromoscope colour record by a single exposure on one sensitive plate was also described, and the images of one of these records were superposed upon the screen by means of a triple lantern attachment, reproducing in splendid colour a dish of fruit. Permanent colour-print lantern slides made from the photo-chromoscope negatives were also shown, and attention was called to the fact that, although the lecturer had shown such slides years ago, and published the method, which, in important particulars, was all his own, it had recently been claimed as new in France and Germany. It was an interesting, and might prove to be a commercially valuable, process; but the photo-chromoscope system, with its colourless colour records, was of far more practical importance than any other application of the principle, because it was the only one that compared favourably with the ordinary photographic process in simplicity and reliability.

The stereoscopic photo-chromoscope, not much larger than an ordinary hand stereoscope, and remarkable for the simplicity of its construction, was shown to the members at the close of the lecture. Mr. Ives suggested some of the useful purposes which the invention promises to serve, as follows:—In the first place, the works of the old masters can be reproduced by the instrument with every touch and tone of colour depicted as in the original masterpiece. The colour records, occupying little space, can be stored in a small cabinet, or readily sent from place to place for purposes of reference or exchange, affording to the artist opportunities to study at his leisure, and in the quiet of his own studio, the technique of the acknowledged masters of his profession, although the original paintings may not be accessible to him. Decorative work of all kinds can be as faithfully reproduced for the use and study of designers—tapestried hangings, mural paintings, stained-glass windows, furniture, pottery, enamels, &c. Landscapes from all parts of the world, and rare and valuable objects of scientific interest can also be included in the cabinet of colour records. It will even aid in medical diagnosis by acquainting the practitioner with the actual appearance of skin diseases, and their changes from day to day under various conditions, which he has not met with in his own practice. It will not be at all surprising if its value to the science and practice of medicine shall prove to be incomparably greater than that of the

so-called New Photography with the Röntgen rays. It will even prove of considerable value, especially in that country of great distances, America, to many commercial travellers, enabling them readily to show to their customers the exact appearance in colour of objects of merchandise which are too large or too valuable to be economically carried about as samples. It will also probably become an adjunct to every school and college in the world, not only as a beautiful illustration of applied science and a graphic demonstration of the principles of colour vision, but because it will afford, by means of colour records of rare natural history objects and peculiar cabinet specimens, a virtual extension of the school's collection, which may add enormously to its educational value. Its application to portraiture is too obvious to call for comment. Still other useful applications have already been suggested, and new ones, doubtless, will be as it becomes better known.

Brixton and Clapham Camera Club.—An excellent series of slides of Swiss scenery was shown by Mr. W. H. Whittard, after which the slides sent in by members for the Society's March competition were exhibited, and the awards announced by the Judges (Messrs. J. W. Coade (President), E. Dockree, and J. Price), the bronze medal given by the President going to Mr. C. F. Archer, the prize slide being a splendid representation of orchids and lilies in a vase. The second prize (a silver spoon given by Mr. W. Fraser) was won by Mr. R. Fisher, jun., a novice in lantern work, who will probably become a dangerous competitor in future; and the third prize (a salad fork and spoon, also presented by Mr. Fraser) by Mr. J. Gunston, Messrs. W. H. Whittard and A. Bedding being commended by the Judges.

Bromley Camera Club.—March 6, Lantern Evening.—The following members exhibited slides:—Mr. R. W. James, M.I.M.E., Mr. H. Bard, M.A., F.C.S., Mr. E. H. Rogers, Mr. S. B. Webber, and Mr. P. M. Smith. Mr. Stanley Hawkins, C.E., gave a practical demonstration of the working of the New Photography, and a number of slides were put through the lantern, Dr. Scott, B.A., making a few remarks on the use of the New Photography to the medical profession. Dr. Playfair, F.L.S., also spoke, and handed round a number of prints taken by Professor Sylvanus Thompson. The next meeting of the Club will be held on the 20th inst., at the Club's rooms at the Literary Institute, when the subject will be *Development*, by Mr. S. B. Webber.

Camera Club.—March 5, the Earl of Crawford in the chair.—Optical matters were to the fore, and

Two New Lenses

were described by their producers, Mr. Dallmeyer and his colleague, Mr. H. L. Aldis. The first of these instruments seems to have been suggested by Mr. Bergheim, the well-known amateur photographer of Vienna, whose works have of late years attracted much attention at the Pall Mall Exhibitions and elsewhere. We may call to mind one frame in particular, in which three heads of the same woman were shown, illustrating what could be done with a plain subject by arrangement of light, costume, and pose. Mr. Bergheim arrived at that softness of outline and detail in a head which is characteristic of such a painter as Greuze, but he found no lens which would meet his aspirations. Every one knows how a portrait lens, used for a large head, will cause one feature to be sharply defined, whilst its neighbour is fuzzy. In this difficulty with his tools, Mr. Bergheim fortunately met with the help of Mr. Dallmeyer, and the skilled optician soon appreciated what was wanted, and saw how the problem could be solved. The result of his labours is found in the Bergheim-Dallmeyer lens, which will be hailed with joy by all photographers who aspire to artistic portraiture. The lens gives uniform softness, and the only persons who are likely to quarrel with its performance are the retouchers, for they will find their occupation gone. Perfect drawing and modelling of the head and face is practicable with the Bergheim-Dallmeyer lens, but freckles and all other facial blemishes are no longer emphasised on the negative, and therefore need no pencilling out. The other lens is that which has already been introduced to the Royal Photographic Society by its author, Mr. H. L. Aldis, B.A., and it is known as the Dallmeyer Stigmatic. The chief defects in the older types of lenses—that is to say, before the introduction of the Jena glass—curvature of field and astigmatism, are in the new lens almost entirely eliminated. Moreover, it works at *f*-4 over an angle of sixty degrees in a very satisfactory manner, as was indicated by the lantern pictures shown, so that photographers will feel anxious to become better acquainted with its advantages.

Croydon Camera Club.—March 4.—The subject of the evening was

An Introduction to Photo-micrography,

by Mr. J. Packham, F.R.P.S. In the course of his introductory remarks the lecturer said that his knowledge of the subject was due to the tuition and encouragement he had received some years ago from a member of the Croydon Camera Club. He trusted that he in his turn would be the inspirer of other members who at present were unfamiliar with the advantages and beauties which followed the photographing of microscopically small objects. Mr. Packham began his demonstration by showing and explaining the uses of the various appliances needful. The microscope employed was a "Cambridge Model," by H. Crouch. The objective lenses were attached by means of a black-lined tube to the lens of a quarter-plate camera; an ordinary flat-flame paraffin lamp was employed with a condenser; Edwards's isochromatic plates, combined with a yellow screen, placed behind the objective, were advised. With the above the exposure ranges from five seconds to as many minutes. Mr. Packham also explained his method of masking negatives previous to making lantern slides therefrom. Developer used was hydroquinone; pyro soda has also been found of value. At the termination of the demonstrations, about fifty lantern slides of photo-micrographs were thrown upon the screen and explained. Most of them were taken as described in the preceding remarks. Some, however, had been photographed from opaque sections by means of polarised light.

Croydon Microscopical and Natural History Club (Photographic Section).—March 6, Mr. J. H. Baldock in the chair.—Mr. A. Roods, the Hon. Librarian, read a paper on

Presto Paper.

Mr. Roods stated that this paper stood as it were midway between a printing-out paper and a development paper, because it was not absolutely necessary that any visible image should present itself on the paper as it came from the frame; but, at the same time, it often happened that parts of the image could be seen. The paper seemed to be admirably adapted for use by artificial light, and oil lamps, gas, Welsbach, and magnesium ribbon all gave good results. Daylight, on the contrary, appeared to be worse than all, unless very dull and subdued, as with it there was great risk of over-exposure, which was to be avoided, as it tended to produce general fog and blocking up of the shadows. He had found that about twenty minutes to oil or gas was somewhere near correct, while Welsbach required only ten minutes. In the case of magnesium, about six inches at a foot was not far from correct. The paper could also be used for enlarging, and he showed some prints produced in this way. One merit of this paper consisted in the fact that, unlike some other papers of a somewhat similar character, it did not require any preliminary treatment with potassium bromide, which it would be at once seen was a distinct advantage. The developer used by Mr. Roods was hydroquinone, as recommended in the published formula issued by the maker. This worked well and gave satisfactory results. The print received no preliminary washing, neither was washing necessary after development; thus time was saved, as the print was put straight into hypo, but, after fixing, it was necessary to wash for about fifteen minutes before proceeding to tone. The toning bath used by Mr. Roods was the ordinary sulphocyanide bath, and with this he got prints almost black (this appeared to result from the exposure having been somewhat too short), warm brown, and dark brown. If toning was carried too far, an unpleasant slaty colour manifested itself. Mr. Roods had used the combined bath of hypo, sulphocyanide, and gold, but he personally preferred the separate bath, which was, moreover, in his hands, much quicker. After toning, the prints were well washed in the usual way. Mr. Roods developed, fixed, and toned several prints which had been previously exposed to all the before-mentioned sources of light, and obtained some very good results. The Chairman said he had had some experience with this paper, and could in the main support all Mr. Roods had said. He thought the fact that the paper could be used in very dull weather, and by artificial light, were great points in its favour, as it enabled prints to be obtained at any time during the worst winter weather, and also by those who could only find time to work in the evening.

North Middlesex Photographic Society.—March 9, Mr. Mummery (the President) in the chair.—Mr. C. A. Hamilton was unanimously elected a member of the Society. Messrs. Burton and Braham, of the Autotype Company, then proceeded to give a demonstration on

Carbon Printing.

Mr. Braham described the whole process, and emphasised the fact that there was more variety in tones that could be obtained at will by this process than all others. Mr. Burton then developed numerous prints on various supports, from the rough Creswick paper to quite smooth; also some transparencies on glass. In reply to various questions, Mr. Braham said that there was a difficulty in combining clouds with a landscape, and they generally put them in the enlarged negative by hand when it was required in making enlargements.

Putney Photographic Society.—February 26, Dr. W. J. Sheppard in the chair.—There was a good assembly of members and friends to hear a description of

A Visit to Spain,

given by Mr. E. D. Purcell, and illustrated by lantern slides, which included bull-fighting and other Spanish customs, the last one showing two most dangerous weapons of that country—*i.e.*, the stiletto and the ladies' fan. Mr. Purcell's easy way of speaking and humorous remarks added much to the enjoyment of the lecture. Slides by Miss Purcell (who, with Mr. Purcell, are ex-members of this Society) were then thrown on the screen, as were also sets by the following members: Dr. C. Wyman, Messrs. Colebrook, Robertson, Plank, and Wm. Martin (Hon. Secretary).

March 3.—Dr. W. J. Sheppard in the chair. Mr. Francis T. Beeson gave a demonstration on

Retouching Defects in Negatives.

Mr. Beeson, who, at a former meeting, had dealt chiefly with improvement of negatives by chemical means, now confined himself to various modes of treatment by hand or mechanical means, and showed how vastly negatives could be improved by the exercise of a little practice and ordinary care, with a certain amount of patience thrown in. The lecturer recommended the more general use of isochromatic plates with full exposures, as the amount of retouching was often considerably lessened thereby.

Aintree Photographic Society.—March 6, Annual General Meeting, Mr. W. B. Hellon in the chair.—The report pointed to a steady progress, and a substantial balance is in hand on the past year's working. The title of the Society and some of the rules were somewhat modified. The election of officers for the ensuing season resulted as follows:—*Hon. President:* Mr. I. E. Bennett.—*President:* Mr. C. H. Adkins.—*Vice-Presidents:* Messrs. J. R. Jones and W. B. Hellon.—*Council:* Messrs. R. M. Owen, John Watson, W. Lockier, J. Harris, G. Ashley, C. F. Iuston, John Wilson, and Dr. Fleetwood.—*Librarian:* Mr. G. H. Jackson.—*Lanternist:* Mr. T. Beer.—*Treasurer:* Mr. W. H. Lloyd.—*Secretary:* Mr. D. J. Neill, 8, Chelsea-road, Aintree.—*Assistant Secretary:* Mr. E. P. Heron. The Liverpool Amateur Photographic Association 1895 prize slides were shown on the screen, as well as a number of Mr. Paul Lange's 1895 frost scenes, which were very much appreciated, also a number of interesting slides kindly lent by Messrs. Archer & Sons, of Lord-street, Liverpool. Several items of music were given by the members, including Miss Dickinson and Messrs. R. M. Owen and John Wilson, the violin solos by the latter being greatly applauded. The Aintree Photographic Society dates from 1894, has its headquarters at the Walton Institute, Seftonroad, close to Preston-road Station (L. and Y. Railway), and meets on the first Friday in each month. President, Mr. C. H. Adkins; Secretary, D. J. Neill, 8, Chelsea-road, Aintree. The subscription is: Members, 5*s.*; Associates, 2*s.* 6*d.* No entrance fee. An Annual Exhibition is held. Total

number of members, fifty-eight. Lantern Exhibitions are held in the winter, and Excursions during the summer months. Its object is to render mutual assistance in all things photographic.

Birmingham Photographic Society.—March 3.—Subject, *Photography of Microscopical Objects*, with practical demonstration in the use of the apparatus by Mr. FRED ILES. After describing the uses of the different movements of the apparatus, and showing his method of focussing by the aid of the eyepiece of a microscope (the objective being uncorrected), the lecturer made several exposures, developing them with quinol developer. The lecture was concluded with a very fine show of stereoscopic micrographs by the aid of the lantern. Many questions were asked and satisfactorily answered.

Leeds Photographic Society.—March 5.—A number of photographic exhibits were examined by the members, and an exceedingly favourable opinion expressed regarding the workmanship and practical utility of the Acme camera, Alpha hand camera, and the Vanneck hand camera. Mr. B. A. BURRELL, F.I.C, then gave a lecture, with experiments and demonstration, entitled,

MORE CHEMICALS USED IN PHOTOGRAPHY.

This lecture dealt with some of the chemicals used in the production of the photographic negative. The fixed alkalies, both in the caustic and carbonated condition, were first noticed, and attention was drawn to the composition of the various forms of sodium carbonate. In making up a developer, washing soda should never be substituted for the anhydrous sodium carbonate without it was so stated in the formulæ, and the carbonates should not be confounded with the bicarbonates. Alum and its hardening effect on the film were described. Mr. Burrell stated that he had lately made some experiments with formalin, using this substance in place of alum. A dilute solution of formalin was found to have a very powerful hardening effect upon the gelatine, quite equal to that produced by the ordinary alum bath, with the advantage that little or no washing, after the formalin bath, was required. The effect of sodium sulphite in preventing stain was demonstrated, and then followed an appeal against the use of the combined alum and fixing bath, and it was shown how the advantage claimed for this bath could be obtained in a way that was free from the evils connected with the mixed alum and hypo. A very dilute solution of permanganate of potash was recommended as an eliminator of hypo. This substance is preferable to peroxide of hydrogen, as it is not so liable to decompose, and can be made of a definite strength, and the colour is an index of the destruction, or otherwise, of the hypo. The Committee elected the following gentlemen as members of the Leeds Photographic Society: Mr. Alderman Scarr, Rev. J. J. Merry, Messrs. Henry Dyson, J. Arnott, George Brunton, J. I. Bain, R. Stockdale, W. S. Braithwaite, R. H. Slade, W. H. Beckworth, F. J. Borland, F. Pindar, J. E. Baines, and H. Illingworth.

Rotherham Photographic Society.—March 3.—Mr. T. A. SCOTTON, of Derby, very successfully demonstrated the subject,

IRON PROCESSES IN RELATION TO COPYING DRAWINGS, &c.

Mr. G. T. M. Rackstraw presided. Mr. Scotton showed the simplicity of the ferro-prussiate method—white lines on a blue ground—the more generally adopted process of blue lines on a white ground, and a plan by means of which the blue lines could be converted into an intense black. With regard to the latter, he explained that the inventor's formula was a secret. The drawback was the number of different baths which had to be used. In copying drawings by photography, he suggested that the negative should have a preliminary bath of gallic acid. For printing, he recommended platinotype paper.

Edinburgh Photographic Society.—February 27, Mr. H. Blanc, A.R.S.A., in the chair.—Mr. J. G. GOODCHILD, F.G.S., F.Y.S., M.B.O.U., delivered a lecture entitled

THE SCOTTISH COAST LINE.

By means of limelight views the lecturer showed how the action of the sea and weather told on the different rocks and contributed to bring about modifications in the coast line, the weather having a great deal more to do with the matter than was generally supposed.

MARCH 4.—Mr. J. C. Oliphant, M.A. (President), in the chair.—Mr. G. BALDWIN BROWN, M.A., Professor of Fine Arts in Edinburgh University, delivered a lecture on

PHOTOGRAPHY AND ART.

Professor Brown held that photographers should not attempt to compete with painters in the matter of picture-making, although, with certain limitations, very artistic work could be produced by the camera. The worker with the camera should rather confine himself to photographing effects which the artist could never hope to draw, such as instantaneous cloud effects, moving water, &c. In Italy of the fifteenth century, or in Germany and Holland of the seventeenth century, photography might have set up as a rival to art, because in those days a great deal more detail was painted than is done at the present time. Studies from the life, Professor Brown said, should not be attempted by photography; they should be left to artists, for the reason that no human figure was perfect enough for the camera, whereas a painter could leave out or add as he pleased. The lecturer strongly depreciated the extensive use of retouching.

Photographic Society of Ireland.—February 27, Mr. Alfred Werner (Vice-President) in the chair.—A lecture entitled

PICTORIAL DUBLIN (OLD AND NEW),

and illustrated by lantern slides, was given by Mr. R. L. STRANGWAYS, M.A., Vice-President. The lecture, which was delivered in excellent style, was one of the best ever given before this Society. There was so much of interest to Dubliners about their city explained throughout that it elicited great attention on the part of the audience, while the good humour and refined fun displayed by Mr. Strangways in his observations when occasions presented themselves—for instance, in his description of the methods of conveyance a few centuries ago, and the evolution of the outside-car, besides his droll remarks on the studies or drawings of ancient Dublin by bygone artists—evoked much merriment. The pictures were well adapted to the lecture, and, in many instances, depicted street life in some of the back streets in various parts of the city.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

TRAILL TAYLOR MEMORIAL LECTURESHIP FUND.

To the EDITORS.

GENTLEMEN,—Several members of the Council of the Photographic Convention of the United Kingdom have been discussing the desirability of making a donation from the funds of the Convention towards the above, considering that the late J. Traill Taylor was virtually one of the founders of the Convention, and that the funds so devoted towards the Memorial Lectureship would, while advancing the general interests of photography, serve to keep well in remembrance the labours and high qualities of our late dear old friend.

It has, however, been represented that such a donation can only be legal by being determined upon by the members of the Convention assembled at the Annual General Meeting, when the matter will be laid before them by the Council at Leeds, next July, it having been arranged that the subscription list is to be kept open for some months longer to allow time for contributions to arrive from America and the colonies towards the Memorial Fund.

May, then, this opportunity be taken of placing the matter also before those societies and individuals throughout the country who have not yet responded to the appeal for funds to found the Lectureship, to many of whom the advice and friendly offices of Mr. Traill Taylor were always available, and who will see that, while the object of having such a series of lectures delivered on photographic matters throughout the country will tend to the great advancement of photography, it will be the best possible means of perpetuating the name and labours of J. Traill Taylor, by keeping his memory green.

Mr. Alexander Mackie, of 3, Upper Baker-street, W., the Hon. Secretary for the Fund, will gladly acknowledge any sum that may be forwarded to him. Apologising for trespassing on your valuable space,—I am, yours, &c.,

R. P. DRAGE,
Hon. Sec. Photographic Convention of the United Kingdom.

KINETOSCOPY ON THE SCREEN.

To the EDITORS.

GENTLEMEN,—Referring to Mr. G. R. Baker's notes on the projection of moving objects on the screen, I am quite willing to admit that to Messrs. Lumière belongs the credit of being the first in England to show the outside public such figures; but, at the same time, I think it is only fair to myself to point out that I successfully showed such pictures at the Royal Photographic Society on January 14, which antedates Lumière considerably. I think it only fair to point out that I was the first in Europe to *successfully* take photographs suitable for either the kinetoscope or the kinetic lantern (many of my *earlier* successful photographs, not being historical subjects, of course, bear no indisputable date); but it is well known that I successfully photographed the Oxford and Cambridge Boat Race last spring, also the Derby, in which is shown clearing the course, the race, and the rush across the course after the race; further, I took a series of photographs at the opening of the Kiel Canal in June last year. The photographs also of the Boxing Kangaroo, Tom Merry, lightning cartoonist, dancing girls, bears, &c., as well as the magnificent wave picture at Dover, are also mine.

I have gone into this matter at some length, as it came to my knowledge that a certain individual had advertised himself as sole manufacturer of these films, whereas he had no more to do with the taking or making of these films than you, Mr. Editor, have had. Now that projection lanterns are springing up like mushrooms all around, I think that it will be useful to know that Mr. Friese Green holds what is really a master patent; and, as he has arranged with a syndicate to run his apparatus, I should not be at all surprised if he asserts his patent rights. I am informed that his claim is a good one, and so thoroughly am I convinced of his rights that I have already entered into an agreement with him, by which I have secured the right of working under his patent. I confess that I was entirely in ignorance of Mr. Friese Green's work when I designed my apparatus, and, as a matter of fact, the principle on which I work is mechanically different to his, but his claim to passing a series of pictures on an endless band intermittently is original with him, and I have very little doubt but that he will be able to uphold his claim.

It may seem a contradiction for me to claim that I was the first to successfully solve the difficulty in Europe in the face of what I have just written, but it is a fact that with my apparatus I am able to take pictures at almost any speed (I have gone as high as 100 per second) *accurately spaced*, which is the crux on which nearly every one has failed. Mr. Friese Green's pictures were, I believe, accurately spaced, but he did not contemplate such great rapidity as the kinetoscope involved. Apologising for trespassing on your valuable space,—I am, yours, &c.,

March 7, 1896. BIRT ACRES.

PHOTO-CHROMOSCOPES.

To the EDITORS.

GENTLEMEN,—The general tone of Mr. Ives's letter in your last issue but one is somewhat of a surprise to me.

When I described my colour camera in your columns, my sole intention was to give your readers an opportunity of becoming acquainted with my apparatus in the same way as I have explained it before some of the London societies. I had not the slightest intention of entering into a patent wrangle with Mr. Ives or any one else, and I think myself right in supposing that there are more convenient and effective methods of settling patent disputes than piling up statements on assertions in the Correspondence columns of your JOURNAL.

Nevertheless, Mr. Ives's letter, though mainly a repetition of his former assertions, contains such a wide extension of his claims, and so many misleading statements, that I cannot allow it to pass unnoticed.

In the first place, I would ask Mr. Ives whether, when he makes a statement in the press, he expects it to be accepted as the expression of his honest opinion; and, if so, how can he reconcile his present statements and the tone of his last letter with his own words on page 109, "I cannot doubt that he (*i.e.*, myself) conceived the idea independently?"

Again, Mr. Ives states that several important features contained in his specification do not appear in mine until December 19, 1895, some time after descriptions of his apparatus appeared in the London photographic journals. This is a misstatement of facts, as a reference to my specification will show. There is not a single important feature shown or described, and absolutely nothing claimed, in my complete specification of December 19, 1895, which does not appear in my provisional of February in that year! Does Mr. Ives, in his anxiety to support the contention that my apparatus is a copy of his own, forget that his English specification was only accepted on January 11 of this year, previous to which it was not accessible to the public, and was not printed until a week or two ago?

As regards the rest of Mr. Ives's dates, and his broad claim to my apparatus, and to be the originator of all my ideas, I can only say that he is perfectly incomprehensible, unless he fondly imagines himself to be invested with the sole right of originating everything in connexion with colour photography.

If Mr. Ives is so conversant with the use of semi-transparent silvered mirrors, *and is able to make them successfully*, as he now states, why has he not utilised them in either of his recent patents, instead of the admittedly incomplete methods he employs?

Touching this, let me quote from this very specification which Mr. Ives holds up as the fountain of all my photo-chromoscopic knowledge. Here, Mr. Ives, after referring *only* to plain glass reflectors, coloured glasses and platinised mirrors, but making no reference to silvered mirrors, says: "Platinised mirrors, although transparent, reflect more light than do plain or coloured glasses, *and would be preferable to the latter if they could be made with perfectly plain surfaces.*" The italics are mine. Surely it is deplorable to see an inventor with the very mirrors he requires, so to say, "up his sleeve," yet failing to take advantage of them! But, truly, one's pity deepens to find this same inventor, in his latest patent of February 21, 1895, which is supposed to be the very acme of photo-chromoscope cameras, for want of his own (?) silvered mirrors, having recourse to wedge-shaped glass reflectors chosen at random from a crate of glass, to fixed focus lenses and a complicated optical system, that he may be able to focus his pictures!

Certainly Mr. Ives is wise in recollecting that instruments exist "with differences of detail only." What constitutes Mr. Ives's patent photo-chromoscopes but an adaptation of the ideas of others—Maxwell Young, Helmholtz, Du Hauron, Collen, &c., "with differences of detail only?"

Finally, let me inform Mr. Ives, that as I consider my apparatus is vastly superior, for the purpose for which I constructed it, to his photo-chromoscope, and as it is solely my own invention, I intend to make and offer it on the market whenever I think fit. Further, if all my ideas are only his, if I have "no standing either in fact or in law," Mr. Ives has now an ample opportunity of putting his claims to the test by opposing the sealing of my patent, and I challenge him to do so.

Such a proceeding will be more to the point, and much more dignified than making misleading statements and random assertions which he cannot prove.—I am, yours, &c.,

B. J. EDWARDS.

The Grove, Hackney, March 9.

THE ROYAL PHOTOGRAPHIC SOCIETY ELECTION.

To the EDITORS.

GENTLEMEN,—As untrue statements, in which my name is freely used, are being publicly made, I ask your permission to state a few facts.

There is no progressive "clique" or party. In the best interests of the R. P. S. and of photography, I wish there was such a party. At present, reforms which are supported by a large majority of the active members can be defeated by a small but organized minority, because the majority is not organized. Members who attended the enthusiastic special general meeting in December need not be reminded how their practically unanimous wishes can be practically disregarded by the Council.

As there is no progressive party, a few of us agreed to prevent the scattering of our own votes, and to ask those members whom we believed to be of the same mind to join us. Hence the "circular," hateful to certain rancorous writers.

It is not true, as has been stated, that we oppose the election of any old member. The candidates we supported for twenty places on the Council were twelve in number: eight retiring members and four new men. The eight blanks left room for *every retiring member of Council who had not stated his determination to refuse re-election*, and I believe that most of us voted for them.

It is not true, as has been stated, that we are opposed to Captain Abney.

Many of us regard Captain Abney as an ideal President, but many of us very strongly object to long-term presidency. Some of us think that see-sawing in two-year terms between two presidents (even though they be such excellent men as Captain Abney and Sir Henry Trueman Wood) is rather a disgrace to the Society. To some of us it looks like a proclamation to the world that the Society has only two men fit to fill the presidential chair. Until quite recently we believed that Captain Abney was strongly with us in this view. Two years ago, when pressed to stand for a third term, he refused, and at the annual general meeting stated that his refusal was a demonstration against the long-term system. Sir Henry Wood similarly stated his belief that two years' presidency was the longest advisable, when refusing to stand again this year. It seems, therefore, unfair to use the fact of our nominating another gentleman than the two above named as a handle to attempt to prejudice Captain Abney against ourselves or our cause.

It is not true, as has been stated, that our "circular" was a failure, and that our views were practically repudiated by the Society. We supported one new man for the Vice-Presidency, and four new men for the Council.

Of the five, four were re-elected, as well as the whole of the retiring members whom we supported. We only supported one man whom the election has not endorsed, and those who have stood year after year unsuccessfully, in face of the solid (so-called) retrograde party and the non-attendant vote swayed by a big nomination list, know what this means. If we *had* opposed any old members, or solidly withheld our support, as their truthless taunts appear to be urging us to do, they might possibly now have been in the position of outsiders.

Now that the election is over, and we cannot be so readily charged with place-hunting, it seems wise to put on record some of the principles which some of us believe must be carried if the Society is to realise its high possibilities. As I understand them, these principles are:—

1. Annual election of a proportion of councillors who have not served in the immediately preceding year.
2. Withholding of the names of nominators from the ballot paper.
3. Holding of Council meetings on evenings other than those of the Society's meetings, so that matters of importance need not be adjourned *sine die*.
4. Long-term presidency to be abolished.

There are many members who are now awaking to the *facts* of the Society's management, and who will not long be content with the mere statement of some of the old hands that all suggestions of reform are the suggestions of self-seekers. They will not permanently be diverted from principles by attacks on those who support the principles. They will not permanently believe that attacks on the long-term system are based on a hatred of Captain Abney or of the few good men who happen to be the oldest members of the Council; and I think that some of the opponents of change would be wise to state and defend their own positions rather than to continue relying on side issues and personalities.

It is not my custom to write over a *nom-de-plume*, but I do so now in deference to the gentlemen who charge any member unfortunate enough to be young and active with being a seeker of self-advertisement. At the same time, you are at liberty to give my name to any one who thinks it is his business to know it. I think that the members of the R. P. S. can carry its reforms without making a "progressive party;" but, if not, the party will be organized and will work in the daylight.—I am, yours, &c.,

RANK AND FILE, F.R.P.S.

THE ARTIGUE PROCESS.

To the EDITORS.

GENTLEMEN,—Some statements in the article signed "Dogberry," published in the last number of your paper, are calculated to mislead the

public as to the qualities of the Artigue and bichromated gum processes. The author has the straightforwardness to begin by telling us that "he is ignorant of the details of the process." This explains, in a way, the strange statements found later on, but it is not a sufficient caution for the general public.

Being well acquainted with both processes, I think it necessary to give on the subject some explanations, warranted, I think, by my experience.

Mr. Dogberry seems to think that the carbon process without transfer, such as is illustrated by the Artigue and bichromated gum processes, can only be used for broad effects, such as enlargements give. If, before writing this statement, he had taken the trouble to examine some Artigue prints taken from a direct negative, such as the Salon pictures of Capitaine Puyo, he would undoubtedly have withheld it; for he would have seen that for correct gradation, and minute detail, no process can give more perfect results than this carbon process without transfer.

As for the bichromated gum process, it can give exactly the same results as the former one, according to the way it is worked. I have obtained with fine colours, thin coating and smooth paper, the most harrowing details. These prints have not been shown at the Salon, simply because I did not like them. It is a matter of taste; but I maintain that it is absolutely certain, and proved, that the Artigue process, and the bichromated gum process, can, *at will*, give what Mr. Dogberry calls a perfect carbon negative—a print in which every separate eyelash, and every individual freckle of the model, is minutely and correctly represented. This is a fact, and it seems to me that the text-books mentioned in Mr. Dogberry's paper have only given us theory.

Asking your indulgence for my Continental English,—I am, yours, &c.,
Paris, March 7, 1896. ROBERT DEMACHY.

I include a bichromated gum print taken from a direct negative on drawing paper, not smooth paper. Is there anything of the scene-painter effect in it?

[There is nothing of the "scene-painter's effect" in the print sent, which is an excellent specimen of the process. We may say that we have had many opportunities of comparing the Artigue prints of Puyo, M. Demachy, and others, with ordinary carbon photographs, and have found it difficult to discover that they lose by the comparison.—EDS.]

COLOUR-RENDERING ON ORDINARY PLATES.

To the EDITORS.

GENTLEMEN,—In reply to "Dogberry," I have *not*, in the written communications he criticises, expressed what is my own opinion, respecting ordinary *versus* orthochromatic plates. Further, I have the highest regard and admiration for the splendid aids to photographic advancement given by many gifted writers and perspicuous *savants*. What I protested against was *rubbish* and *twaddle*. All I can say is that, if "Dogberry" has not met with piles of such stuff, in both text-book, and laboratory, his experience or discernment is decidedly unique. How many thousands of photographic smatterers are there who

> "Know many an amulet as charm,
> That would do neither good nor harm,"

and go about proclaiming, with test tube or goose quill, that their trash is as good as gold.

I cannot here, or will not, enter into the whole question raised by Mr. White, but in deference to your wishes, expressed last week in an editorial paragraph, I will ask Mr. White to hasten the publication of the substance of his communication to the Croydon Camera Club. Meanwhile, those interested can profitably occupy themselves with Mr. Sandell's challenge.

Moreover, I have reason to hope that, in the course of a few weeks, a third member of the Croydon Camera Club will make a novel and important communication to the Club, which has a direct bearing on the subject under discussion.—I am, yours, &c., HECTOR MACLEAN.
Croydon, March 7, 1896.

To the EDITORS.

GENTLEMEN,—Pressure of work prevented me from replying to Mr. Sandell's letter last week. I regret that I cannot consent to meet Mr. Sandell, as he totally ignores the two main points of my challenge; and, further, it was my intention, in challenging Mr. White, to uphold a well-known principle, and not to advertise any particular make of plate, which seems to be Mr. Sandell's idea.—I am, yours, &c., E. J. WALL.

SHADOW PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—In reading the letters in your JOURNAL bearing on the X rays, I have been surprised that none of your readers have tried the plan mentioned at the Academy of Sciences in Paris by M. Le Bon and M. Murat. Having had a breakdown with a Crookes' tube, and being in the country, I thought I would try their plan, as it required no apparatus, and was discredited when received. It is, nevertheless, a fact that shadow photographs can be taken with or without light, and either lamp light, magnesium light, or daylight, answers.

I have used some scores of plates, and have only failed when not knowing the exposure. Without light all night in the dark room was sufficient, but the articles must be taken from the light first; if taken from the pocket in the dark room, I failed. With a petroleum lamp the exposure was two hours; with magnesium, thirty-six inches had to be burned; with sunlight, forty minutes were sufficient. Slow plates all. In all the experiments the articles were protected as follows: The plate was put in an Ilford plate box, with coins, &c., on top, the lid put on, and then it was wrapped round with a ferrotype plate, and underneath a piece of tea lead, this being bent round the head and sides, and pressed against the iron on the top. If any of your readers will try this, they will find no need to invest in an expensive apparatus.

I send you two untoned prints from negatives in daylight of two coins, a brass bureau handle, and a piece of notched ebonite with a few strands of white thread, you will notice a curious point that the white thread shows on the black ebonite.—I am, yours, &c., G. SCOAAH.

DENSITY IN NEGATIVES.

To the EDITORS.

GENTLEMEN,—I am much obliged to Messrs. Hurter & Driffield for pointing out the error in the report of my lecture at the Camera Club. It should be the *ratio of densities*, not simply the *density*. There are other parts of the report that are so incomplete as to be practically erroneous, but those who are specially interested in the matter will, doubtless, refer to the report in the *Camera Club Journal*, which I shall hope to have an opportunity of revising.—I am, yours, &c.,
March 7, 1896, 11, *Eaton-rise, Ealing.* CHAPMAN JONES.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

RECEIVED: W. W., F. PERCY, COLONEL, G ABBOTT, T. and H. JONES, ALFRED MASKELL, W. POUNCEY, and others. In our next.

COPYRIGHT.—L. H. E. As the copyright has not been registered, you can do nothing under the circumstances.

ACETYLENE APPARATUS.—A. C. (Clapham Junction). Messrs. F. S. Thorn & Co., of Camberwell, supply such apparatus.

REGISTRATION.—PHIL NEWMAN. As you have altered the picture, fresh registration is probably necessary—certainly it is advisable.

ELECTROS.—DORSET says: "Please give me, through the JOURNAL, address of a firm making a speciality of electros for catalogues."—Messrs. Sharrow & Anderson, Cambridge Circus, W.C., supply electros.

REPRODUCTIONS OF PAINTINGS.—W. B. B. Better ascertain if the copyright in the pictures has expired before you start issuing the prints. We see no objection to the exhibition of the picture you refer to, but tastes differ.

PARTNERSHIP.—JUSTICE. As the arrangement was only a verbal one, there is no legal agreement one way or the other. As you have the negatives, we presume you can make what use you like of them. Of course you have no copyright in them.

BROMIDE ENLARGEMENTS.—J. says: "Is there any way of strengthening weak bromide enlargements, such as are got from very thin negatives?"—Try a process of intensification as in the case of negatives: mercury, sulphite of soda, for example.

STUDIO.—S. & CO. From the description, which is by no means clear, in your letter, we should not like to give an opinion. If you will send us a rough sketch of the building as it stands, marking the aspect, we shall be pleased to advise as to the proposed alterations.

BACKING PRINTS.—LENS. Directions for use are usually supplied with the paper. However, it is simply stuck on the back of the wet print, and allowed to dry while on the glass. The prints can then be mounted in the ordinary manner, and the gloss will be retained.

PHOTO MECHANICAL VIEWS.—R. VEEVERS says: "Could you inform me where I can get a quantity of photographic views done by the photographic mechanical printing process?"—Our correspondent had better communicate with Messrs. Morgan & Kidd, Richmond, S.W.

SMOKING STOVE.—A smoky stove in the studio is, as you say, a great nuisance, but a remedy is not so easily suggested. Possibly, if there were less direct angles in the pipe, it would cure the evil; a greater length of pipe outside is sometimes a remedy, so also is a cowl on the top.

BICHROMATE.—H. C. H. From the description we should say that bichromate of potash has had nothing to do with the pimples about the body, as the hands are free. It is the hands, or parts coming in direct contact with the solution, that are first affected. So little as you use the salt, there is no likelihood of danger.

LENS FOR HAND CAMERA.—A. R. FODEN. For general hand-camera work a lens of five-and-a-half inches focus will be found the best. A good rectilinear of this focus will cover the quarter-plate well with a pretty large apertnre. If the full opening is *f*-6, it will require a stop to give good definition all over the plate.

THE COPYRIGHT UNION.—COUNTRY PHOTO. It has been pointed out, time after time, that its members are at full liberty to charge as much as they like for the use of their copyright works—the only restriction is that they do not charge *less* than half-a-guinea. We certainly think it would be to your advantage to join the Union.

GOLD IN TONING.—T. WILLIS. If you get a fifteen-grain tube of chloride o gold to tone a full sheet of paper to a deep rich purple colour, you should be satisfied. If the paper is lightly salted and sensitised, and brown tones only are wanted, then a tube may suffice for a sheet and a half or a couple of sheets. The deeper the tones the larger is the quantity of gold required to produce them.

STUDIO.—R. W. G. The design numbered 3 will be decidedly the best for general all-round work. No. 1 would be preferable if the studio was to be used exclusively for copying or reproduction work. Have thick dark blue blinds (or green) on the south side, both top and side, and brown holland or light blue on the north side. Make both ends of the room opaque, as direct front light will never be required, and, if admitted, would give trouble.

BROMIDE ENLARGEMENTS.—BLISS asks: "Where can I obtain instructions for making and arranging an enlarging apparatus for bromide paper, &c., using my own lantern, condenser, and limelight; title and publisher of book on finishing bromide enlargements in black and white, also in water colour?"—In reply: There is a little book by S. H. Fry, published by Fallowfield (price, we think, 1*s.*), which will probably give the desired information.

CONVEYANCE OF GAS CYLINDERS.—INCONVENIENCE. The Royal Photographic Society, or the affiliated societies, can do nothing in the matter, and we do not see that they could do any good by agitating the question. The railway companies make their own by-laws and by them all using their lines must abide. Possibly, when the long-expected report to the Home Office is issued, they may be induced to relax some of the present restrictions, but it is very doubtful if they will.

DEMENY'S HAND CAMERA.—DR. GRANT writes: "On referring back to your JOURNAL of February 7, I find you speak of having described Demeny's hand camera in a previous number. Through pressure of time, I must have missed seeing it. Would you kindly give the numbers of the JOURNAL referring to it? Also would you kindly inform me as to the maker and price, &c., of Demeny's hand camera?"—We must refer our correspondent to the *Photo-Gazette* (Paris), from which the article we translated was taken.

FADED PRINTS.—G. HIGGINS says: "Will you kindly tell me if there is any means of restoring so that they may be copied: (1) Old faded albumenised prints; (2) An albumenised print that has turned a dirty yellow; (3) The cause of the last-named turning colour?"—1. If the print has actually faded, there is no means of restoring the details. 2. An immersion of the print in a weak solution of bichloride of mercury will generally remove the yellowness, and thus enable a better copy to be obtained. 3. Generally faulty manipulation.

SUBDUING LIGHT.—SOL. Instead of painting over the glass with white paint, to stop out the sun during the summer months, we should recommend the roof to be stippled over with starch paste to which has been added some whiting. This will obscure the glass, and is easily removed at the end of the sunny season. Oil paint is liable to turn yellow, and thus stop out more light than is, often, desirable; and, moreover, it is difficult of removal. Thin muslin, strained on light wooden frames, is excellent for intercepting the direct rays of the sun.

INTENSIFICATION.—FAL says: "In your issue of September 29, 1893, there is an article on *Rapid Intensification* with metol and sulphite of soda. This sometimes gives me excellent negatives, but occasionally it turns the film an amber colour in places, particularly at the edges, which is fatal to good printing. Would you kindly say in your next what is the reason of this?"—We cannot say definitely, but should assume either (1) that the hypo was not entirely removed from those portions of the film, or (2) that the washing after bleaching with mercury was insufficient.

FUSIBLE METAL.—C. WALKER. The most fusible metal is an alloy known as "fusible metal." There are several formulæ for it, and each gives different melting points. Some will melt if immersed in boiling water. Tin-lead and bismuth-lead and bismuth, in different proportions, are its constituents. By varying the proportions, different melting points are obtained. The addition of a little mercury will lower the temperature at which it melts. It may be made to melt as low even as about 150° Fahr. It will be better to purchase the alloy than to make it yourself. It may be had from any operative chemist's. It takes very sharp impressions.

DEFECTIVE LIGHT.—T. PAGE. As you cannot suit yourself with spectacles, although you have tried many shops, we suspect you are suffering from astigmatism, in which case you should consult a specialist. If your means are, as we take it from your letter they are, limited, go to one or other of the ophthalmic hospitals and have the eyes examined, and a formula for glasses will be given.

STRETCHED FILM.—T. BRAINE writes: "I enclose print, unburnished, and should feel obliged if you could give me the cause of the streaks that appear on the surface after mounting. It was damped before the starch mountant was applied in the usual way, and nothing whatever was visible till after the print was dry. Will you kindly inform me whether it is contraction of the paper, as I was very careful not to smear it in any way with my fingers? I may say that the print was thoroughly wetted, and also blotted off afterwards. I have about two dozen, and they are all more or less same as the one sent."—The cause of the marking is that the print has been strained in the mounting to such an extent that the film has strained from the paper.

COLLODIO-BROMIDE, WET COLLODION.—HAMLET says: "1. I am anxious to work the collodio-bromide process (wet) for stereoscopic transparencies, but have not time to make my own collodion. Is Mr. Brooks', Reigate, suitable? I see his name mentioned in this week's JOURNAL (Answers to Correspondents). 2. I have some recollection of a leading article on wet collodion in one of the ALMANACS, but cannot at the moment put my hand on it, perhaps you will please say. 3. Am I informed right that the silver bath must be kept in a strong light when not in use?"—In reply: 1. Brooks' collodion emulsion is suitable. 2. In the ALMANAC for 1896. 3. No; sunning the bath used to be resorted to when organic matter was present. This is probably to what you refer.

TELE-PHOTO LENSES, HAND CAMERAS.—C. THOMPSON says: "I am wishing to buy a lens for long-distant views (half-plate), mountains, &c., also wide-angle lens, and have been told that I can get a combination of the two—single lens distant and double wide-angle. Would you kindly tell me if this is the case; and, if so, what name it goes under; also, if the advertised cameras (without box cover), to be used as ordinary tripod cameras or hand cameras, are as satisfactory as separate ones for hand work?"—In reply: The questions are not quite clear. 1. We presume reference is made to the "tele-photographic lens," which fulfils the conditions mentioned. 2. There are several cameras which are adapted for use both as stand and hand cameras. A copy of our 1896 ALMANAC will give you much information on this point.

PHOTOGRAPHY FOR LADIES.—H. COHN says: "What do you think would be the best department for a lady printer to learn? I am twenty-two years of age, and have been printer for many years, but would like to take something else also. I think, if retouching is not really bad for the eyes, I would like it. What are the abilities necessary for a good retoucher? Would you kindly tell me if it is bad for the eyes, and in what way it affects them; also if any other branch would be better? I would like something that I could go abroad with by advertising, perhaps after a few years."—In reply: A knowledge of retouching is not very difficult to acquire from a competent teacher, and does not, as a rule, injure the eyes. If, in addition to printing and retouching, our correspondent would also learn operating, it would be all the better for her chances of success, either at home or abroad.

SPOTTY PRINTS.—ZERO asks: "Could you kindly inform me what you think would be the cause of the spots on the enclosed prints, and how best to avoid them in the future? They have gone so after only being less than two months in the show-case. I have never met with this difficulty before, and am rather at a loss how to set about to find a remedy, as I cannot think what would be the cause of it. I have had specimens in the show-cases over six months without ever showing any traces of any defects, but this time I have had to take them out after being exposed for about six weeks, as they have all gone similar to the enclosed samples. I have no doubt but what your wide experience will soon point out wherein the defect lies on seeing the enclosed two prints. If it had been a case of fading, I would have put the matter down as a case of not being properly fixed, but these spots I don't think could be exactly called fading. Do you think the mounts could have anything to do with it?"—The spots may be due to the manipulation, the mountant, or the mounts. The most probable cause, however, is bronze powder on the mounts, as the lettering is printed in bronze.

FAILURE IN REDUCING.—RESIDUE writes: "Thank you for your kind information in Correspondence column in answer to my inquiries. I venture to ask you a further question, and I enclose you a small piece of the result of my smelting, thinking, perhaps, you could tell me what it is; it did not melt out into metallic silver, but all formed at the bottom of the crucible in a thick mass, like the piece I send you. It is the chloride, formed with adding salt to an old sensitising bath; this I filtered off, and, when dry, added one part and a-half, as you kindly informed me, of the mixed carbonates of soda and potash. I tried it twice on the fire, two lots, and got the same result, so that, if you will kindly answer once more the following questions, I should be greatly obliged:—1. What can I do with this, that I have tried to melt, for it is nearly a pound in weight, like sample I send you? 2. Is it oxide of silver? 3. Can you assign any reason for the flux not running fine and the silver melting out? Thanking you for your past kindness."—1. and 3. The cause of failure is that the residue has not been subjected to nearly sufficient heat to reduce the silver to the metallic state. Put the residue back in the fire and keep it boiling at nearly a white heat for twenty minutes or half an hour, or until the contents of the crucible cease to boil. 2. No. You speak of putting the crucible "on the fire;" if you are trying to reduce the residue in an ordinary fire, you will certainly fail. The work must be done in a proper furnace, or sufficient heat will not be obtained.

THE BRITISH

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EX CATHEDRÂ.

With reference to our suggestion of last week that professional photographers might profitably make a speciality of the "new" photography, a friend draws our attention to the fact that Mr. Friese Greene, some weeks ago, advertised that he was prepared to exhibit the process in action. His charge for admission was 2*s.* 6*d.*, while for 5*s.* the visitor might have his hand or foot photographed.

* * *

Mr. G. Ridsdale Cleare, photographer, of 97, Lower Clapton-road, N.E., also writes to us as follows on the same subject: "Referring to your first editorial paragraph in last week's Journal, I beg to inform you that I am making the necessary preparations for the production of shadowgraphs by the Röntgen rays, and hope, within a week, to be prepared to execute orders from hospitals, surgeons, and the public generally."

* * *

Mr. A. A. C. Swinton, whose letter will be found in our correspondence columns, also states that he has decided to establish a laboratory specially devoted to the "new" photography.

* * *

Still another letter on the same subject has reached us; this is from Mr. W. E. Gray, F.R.P.S., photographer, of 92, Queen's-road, Bayswater. Mr. Gray observes: "Referring to the first paragraph in the last number of the Journal, I enclose you a contact bromide print from one of my negatives. I have been working at Röntgen 'photography' a great deal with some medical friends, and am quite prepared to undertake the work commercially. In fact, I have already arranged about the advertisements in the medical journals." Besides the above-mentioned communications on the subject, we have had visits from some professional photographers, who have been struck by our suggestion, but yet appear doubtful whether sufficient scope really exists for the new branch of work opened up by Röntgen's experiments. Possibly they will derive encouragement from the examples set them by Mr. Friese Greene, Mr. Cleare, Mr. Swinton, and Mr. Gray. The old adage of "nothing venture, nothing gain," here applies with peculiar force. The gain, of course, is not likely to be very great; on the other hand, the necessary outlay is relatively not large.

* * *

Our professional and amateur readers, and the trade generally, will, we are sure, thank us for giving them the address of a gentleman who is prepared, "with something akin to certainty," to supply fine weather whenever it is required. This gentleman, whose name is J. Collinson, dates from Sandown, Isle of Wight, and his circular, of which we append a copy, has, we believe, been addressed to fruit and vegetable-growers. We presume he would have no objection to also catering for the wants of photographers.

* * *

Mr. Collinson says: "In making business arrangements, the mind frequently suggests that, could a certain kind of weather be depended upon for a few days, or for a week or two, say, rain or sunshine, frost or mildness, or cold, stocks of merchandise, provisions, fuel, &c., could be dealt with with more confidence than under the present conditions. By the discovery of means for regulating a force termed Odylic force, I can, with something akin to certainty, arrange for current weather to be such as you might consider best for the re-

quirements of your business. If, therefore, you, or any of the other leading firms in your kind of business, would, singly or in combination, arrange with me, I would, from time to time, effect such changes in the weather, by means of Odylic force, as might be considered most desirable or necessary."

* * *

A MAN with such wonderful command over the elements as Mr. Collinson claims to enjoy should not be lost sight of by the photographic fraternity. The obvious plan to be adopted is for the photographers of particular towns and districts to club together, and get Mr. Collinson's best terms for fine weather as they may require it. Possibly, Mr. Collinson could also be induced to supply Odylic force in tanks or barrels, so that photographers could make their own fine weather whenever they felt so disposed.

* * *

MR. DAVIS, who opened a discussion on "Art and Photography," at the last meeting of the Richmond Camera Club, is no friend to the claims of photography being ranked as an art. He maintained that the claim of photography to be considered as art in the same sense as sculpture and painting are so regarded was quite inadmissible, chiefly on account of the mechanical nature of the means employed, the narrowness of its scope, and *the absence of all demand on the creative and imaginative faculties of those who use it* He considered that the art treasury of the world was no whit the richer for the masterpieces of photography, and that, should no more photographic exhibitions be held in the future, the world of art would be insensible of their loss. These views run counter to those held by many photographers and some artists, and are noticeable for their refreshing boldness and unconventionality. At the same time, we consider, in respect of the passage we have italicised, that Mr. Davis somewhat spoils his case by overstating it.

THE USE OF THE SWING BACK IN ENLARGING.

DURING last autumn we published an article under the above heading, pointing out the possible utility of the swing back in correcting faulty perpendiculars when enlarging from small negatives, and we should not now refer to the matter again but for the fact that M. Victor Selb has since taxed us with plagiarising an article or articles of his on a similar subject in a foreign journal, and has also, still more recently (*ante*, page 125) denied the possibility of so applying the swing back. We can only repeat what we have already said regarding that gentleman's articles, that we had no knowledge of them at the time we wrote, nor have we even, up to the present time, seen them; but, from M. Selb's denial, it would seem that he and we have written on entirely different subjects.

In a letter, with diagrams, which we need not here reproduce, M. Selb says, on February 21: "When negative and positive to be reproduced are of equal sizes and swing from the perpendicular a same number of degrees, the rays are of equal length—A B as long as C D. When a small negative is placed in a similar position to produce an enlargement, say, of four diameters, the rays or lines are unequally long—E F is much shorter than G H. *The consequence is, the enlarged image is vastly out of focus.*" The italics are ours, and this statement seems to show that the writer has not only failed to grasp the gist of the subject on which we wrote, but is also ignorant of the first rules of conjugate foci. It is precisely on account of this difference in the length of the "rays or lines" to which he refers that sharpness in the enlargement is due.

We may commence by pointing out that M. Selb is incorrect in assuming that, when the negative and reproduction are of equal sizes, they are necessarily swung from the perpendicular the same number of degrees. It is possible that, under some conditions, such a state of affairs might exist, but in actual practice we doubt it, and at least there exists no ready means such as we gave for calculating the position of the negative in order to secure at once perpendicularity and sharpness; but, if M. Selb will refer once more to our original article, he will see why, even in copying by the same dimensions, the "rays and lines" he refers to must necessarily be of unequal length, and the negative and positive respectively swung at a slightly different angle.

Precisely the same rules govern the production of an enlargement, and the same proportionate difference exists between the length of the line that crosses from the top of the negative to the bottom of the reproduction and that which crosses from the bottom of the former to the top of the latter; but, of course, in the case of an enlargement, owing to the greater focal distance, the actual difference will be greater, and it is precisely that difference on which we depend for obtaining the sharpness which we claim and M. Selb denies. The diagrams which accompany his letter show the amount of swing in an absurdly exaggerated degree; but, if he will take the trouble to plot out on a sheet of paper the actual positions of a four-inch negative and an enlargement up to five diameters, using a six-inch focus lens, he will find that the difference between the lines connecting their opposite extremities does not exceed one inch in a total of nearly four feet when the amount of distortion to be corrected is more than will be found in an average negative. That degree of alteration in the longer conjugate in an enlargement of those dimensions would not make a "vast" difference in the quality of the definition, even if it were made in the wrong direction; but, when by the simplest optical laws it is necessary in order to get perfect definition, the absurdity of M. Selb's contention is obvious.

Let us briefly recapitulate the position we take. A negative in which the perpendiculars are faulty is to be reproduced—whether to the same or different dimensions matters not in the least—and, in order to correct those faulty lines, one extremity of the negative must be slightly enlarged or widened, while the other is copied same size. The enlargement is effected by inclining either the negative, the sensitive surface, or both, at such an angle, or angles, that a greater distance exists between the foreground of the negative and the top of the buildings whose perpendiculars fall in in the reproduction; in fact, the very "redressment" of the lines depends upon this difference, which M. Selb objects to. So far as the mere correction of the lines is concerned, it can be secured, as we have said, by sloping the negative or the sensitive surface simply; but there is only one correct position for each if absolute sharpness is to be combined with correct perpendiculars, and in our original article we showed how those positions might be arrived at by calculation in a very simple manner.

Now, when the swing back is employed in taking the negative, it is used in defiance of all the requirements of *definition*, and with the simple object of securing correct perpendiculars; and, so far as sharpness is concerned, the best compromise possible is made between the different portions of the plate by

using a small stop; but, if we adopt the reverse method of securing in the negative the greatest possible sharpness the lens will give without regard to the perpendicularity of the lines, those can be corrected in the process of reproduction without in the least injuring the definition of the original negative. When the definition of the latter, owing to the use of the swing back, leaves room for improvement, it is certainly not in the process of enlargement that that improvement will be effected.

Some misconception exists in many quarters as to the extent of the distortion produced by tilting the camera. It is difficult to produce more than two or three degrees' departure from the perpendicular by tilting the tripod to the utmost limit of safety in the matter of stability, though the error will vary with the distance of the object and the focus of the lens. The angle at which the back must be swung to correct this is much greater, but whatever the error may be when the swing is not used is well within the power of correction in course of reproduction.

Röntgen Rays.—There is no waning in the popularity of this subject, and, owing to the comparative ease with which the effects are attainable, and with apparatus of an almost elementary description, there is a complete surfeit of accounts of mere useless reproductions of Röntgen's experiments from every direction. Amongst scientific men a problem of paramount interest is opened out by the discovery of the X rays, namely, the possibility of their being, and being proved to be, longitudinal vibrations, a condition of the ether which, as a writer in one of the reviews states, is looked upon as the last resource of the physicist to explain unexplainable phenomena in the same manner as the physician diagnoses "nerves" as the cause of obscure diseases. At the same time, the number of believers in these vibrations is steadily increasing, and quite recently Lord Kelvin suggested some experiments for determining the existence of such rays. Lord Blytheswood obtained, and exhibited, sharp photographic effects on a dry plate placed in a dark slide, and the whole wrapped in several folds of black velvet, and then placed in front of the space between the main electrodes of a powerful Wimshurst machine, but not in the direct line of the discharge. He also obtained results of the same character when the slide was held in the direct line of the discharge. Lord Kelvin believes that the effects were wholly or mainly due to sparking from the brass hinges of the shutter, and suggests the use of a closed aluminium box, and no velvet instead of the slide. There would then be no sparking, and, if a satisfactory photograph were produced, the truth of Röntgen's longitudinal wave explanation would be proved, though the absence of such effect would not necessarily disprove it.

Reflection of the Rays.—Professor G. Vicentini and Dr. G. Packer found distinct evidences of an irregular reflection in an experiment they carried out with a brass parabolic mirror. The Crookes' tube and the sensitive plate were placed on opposite sides of an iron plate, so that the rays, if they were to reach the sensitive surface, had to be reflected from the mirror. These observers exhibited their results before the Scientific Institute of Venice. They found that a glass mirror arranged in a manner similar to that of brass gave no reflection whatever.

The Best Form of Tube.—Many new forms of tube are being made, the main object being to devise a construction such as shall cause the rays to emanate as nearly from a point as possible, for it is evident that, unless the opaque object almost touch the glass, there will be penumbra where the radiations emanate from an area of measurable magnitude. Professor John McKay, of the Packer Institute, Brooklyn, has described what he considers the most suitable shape. It is five inches long, and a little over an inch in diameter, a kind sold as a "perfect vacuum" tube; the electrodes are of copper, and only an eighth of an inch apart; but the vacuum is so good that the current will preferably pass round the tube rather than cross the small space. It produces very little light, and does not get heated. The rays radiate in all directions from the centre, so that simultaneous exposures may be made in all directions from the centre.

A Röntgen Kinetoscope.—Mr. E. P. Thompson exhibits visible effects by means of a fluorescent screen, showing the action of bones in motion, such as those of the hand, and he hopes to show the skeleton of the bones of a bird in flight. He makes his screen of the barium platino-cyanide by dusting it over an adhesive surface of varnish coated upon tracing cloth.

A Crookes' Tube not Necessary.—It has already been shown that the Röntgen effects may be obtained without a Crookes tube. Professor McKay obtains the effects from a coil actuated by the discharge from a Leyden jar. Mr. M. F. O'Reilly suggests, in last week's *Nature*, that the attempt should be made to produce sciographs by means of the emanations from the auroral light.

Pinhole Photographs of the Ray Apparatus.—Mr. Ralph W. Lawrence writes to *Nature* from the Masssachusetts Institute of Technology that, by means of a "pinhole" in a sheet of lead, the hole being blocked by aluminium, he has obtained an image of the apparatus and rays. The pictures produced "show very distinctly the two electrodes, while the glass tube, which appears very brightly illuminated to the eye, is scarcely perceptible. It would appear from this that nearly, if not all, the so-called X rays proceed directly from the electrodes of the tube, and not from the glass where this is acted on by the cathode rays."

More Honours for Röntgen.—The learned Professor is to be congratulated on the honours being showered upon him from all quarters, and in so short a time after the publication of his process. The first royal honour was from the Emperor of Germany, and the most recent one from the Prince Regent of Bavaria, who has just sent him a patent of nobility. Evidently meritorious work and discovery is more quickly recognised and suitably acknowledged by royalty in Germany than is the case in England. We doubt much, if the Röntgen method had been worked out by an Englishman, he would have had the honours so quickly conferred upon him by English royalty that Röntgen has in Germany.

By the way, the Röntgen "photography" has already found its way into the Law Courts as evidence. At the recent Nottingham Assizes, in an action for damages for injury through a faulty staircase, photographs of the feet of plaintiff — an actress — taken by Professor Ramsey, at University College, by the Röntgen rays, were shown to prove the injury sustained. Whether the photographs had any influence with the jury or not it is impossible to say, but in the end they awarded the plaintiff substantial damages. During the hearing of the case some amusing remarks were made. On the defendant's counsel telling one of the witnesses that he ought to have scientific evidence as to the value of the rays, Mr. Justice Hawkins remarked, "You might send a man to the lunatic asylum, you know, by photographing his head." One of the barristers, looking at the photographs, asked, "Is this the Trilby?" &c. Evidently the "new photography" was treated with a certain degree of levity, on its first appearance as a witness, by gentlemen of the long robe.

Surgical Use of the X Rays.—The employment of the Röntgen radiations in surgery continues to meet with many applications, and this method of diagnosis will, no doubt, take a permanent place in our hospitals, if not in private practice as well; but it will be well if surgeons at once appreciate the fact that their new ally may possibly become a tacit witness against them as well as a valuable helper. An instance of such an unfortunate *contre-temps* lately came under our notice. A gentleman, well known in photographic circles, had the misfortune, when a youth, to break

his forearm, and break it badly too. The limb was duly set by a surgeon, and the accident became a thing of the past, save that the arm never regained its normal strength, and exhibited a deformed appearance. It recently occurred to this maimed one to see, by means of the Röntgen rays, what kind of a skeleton this limb of his presented, and why it was that the arm was so deformed. So he hied him to a friend who owned an induction coil and a Crookes' tube, and, placing his arm on a boxed plate, had a shadow photograph of it taken. When that plate was developed, it exhibited in a graphic manner the very faulty way in which the broken bone had been set. The *ulna*, instead of being in close partnership with its fellow bone, the *radius*, was entirely thrust out of place, and its head appeared like an excrescence at the side of the wrist, instead of being part of the arm. "It's a good thing for him," said the victim, "that the surgeon who set my arm is dead, otherwise I would certainly take action against him." Let surgeons, therefore, be careful in recommending to their patients the use of a Crookes' tube, in case the revelations it affords should recoil upon their own heads.

Hampstead Heath.—The other day we were commenting upon the appeal which artists have recently made to the London County Council to stay their official hands in the conversion of various parts of London's most beautiful open space to the condition of a park. This protest will, doubtless, have its effect, for there must be men on the Council who can appreciate this desire to preserve the Heath in its natural state. It should, however, be remembered that the Council may fairly be credited with many improvements on the Heath. The ugly brickfields have been hidden under a mass of verdure, and the trees have for the most part been left undisturbed. The beautiful clump of pines which crowned the reputed grave of Boadicea have withered one after the other, and the recent abortive search for relics of the Queen of the Icenæ seems to have given them the *coup de grace*. Surely fresh trees of the same species might be planted here, for the Scotch fir or mountain pine flourishes well on this sandy soil. Witness that other clump of pines near "The Spaniards." It is not perhaps generally known that these trees form part of an avenue which stretched from "The Spaniards" to North End, a distance of about five hundred yards. They were planted by one Turner—not the artist, but a worthy tobacconist of Fleet-street, who lived here, and evidently had an eye for the picturesque in nature. Posterity owes him much for this beautiful addition to one of the beauty spots of Middlesex.

Sunday Opening of the Museums and Art Galleries.—Each year that the Guildhall Loan Exhibition of Pictures has been open to the public on Sunday afternoons, we have commented on the good attendances, and the fact that the opening was a boon to those who could not see the pictures on other days. Last week the House of Commons decided, by a large majority, on Mr. Massey-Mainwaring's motion, that all the museums and art galleries are to be open on Sunday afternoons. How far this has been brought about by the action of the City in opening the loan collection on Sundays, and the success in every way that attended it is, of course, impossible to say, but there is no question it had great weight. Many times similar motions have been brought before the House, but have always been rejected by large majorities. There is little doubt that many photographers, who are fully occupied on week days, will now avail themselves of the opportunity of studying the works shown in our art galleries, and it is to be hoped with profit as well as enjoyment.

Speaking of art galleries reminds us that the annual report of the Director of the National Gallery was issued last Friday. It shows that our national collection has been considerably enriched by the addition of a large number of fresh works, which have been acquired by purchases, bequests, and by presentations. The statistics show that the Gallery was visited, on the 210 days it was open to the public gratuitously, by little short of half a million persons, the daily average being 2250. On students' days (Thursdays and Fridays), when sixpence admission is charged, 41,515 were admitted. The total number of students' attendances for the year 1895 was over 20,000. It will be interesting to see, in the next annual report, what the Sunday attendances will have been.

The Recent Fatal Cylinder Explosion.—The inquest on the unfortunate chemist who was killed at the laboratory of Messrs. Redwood and Hailes, Red Lion-square, by the bursting of a gas cylinder, was concluded one day last week. Although some of the lay press, at the time of the accident, described it as the bursting of a compressed oxygen cylinder, the evidence at the inquiry showed that the cylinder was not charged with compressed oxygen at all, but with stearic acid, glucose, and alcohol, together with a little acetic acid and a few iron nails. The vessel was being heated over a furnace when it exploded. It was stated that there was a valve to the cylinder, but it was closed. The evidence of the experts from the Home Office is reassuring as to the safety of cylinders, for it was mentioned that this one was a good one of its kind, and there was not the slightest fault in it; also that the accident was due to the mistake of filling the cylinder quite full, and then overheating it. A very noteworthy circumstance in connexion with this cylinder, as with the one that burst at Fenchurch-street, is that it was rent from top to bottom, and did not fly into pieces to scatter destruction around like a bomb shell—with which we have heard them compared—would do.

At the inquest a photograph of the room and its contents, taken immediately after the accident, and before anything had been disturbed, was shown. If this could be done in all cases of fatal accidents, it would be far more valuable evidence to the coroner and jury than much of the verbal evidence given by witnesses. Unfortunately, however, a camera is not always readily available, as seems to have been the case in this instance.

FOREIGN NEWS AND NOTES.

A Turmeric Printing Process.—A writer in the *Photographische Chronik* describes this as follows:—Turmeric is derived from the rhizome of two varieties of plants, *Curcuma longa* and *Curcuma rotunda;* the best kind is the Chinese, the next the Japanese, the worst the Barbadoes. Turmeric may be obtained in the form of powder, and gives up to alcohol its peculiar orange colouring matter, a solution of which on paper or metal gives a negative from a negative as the colour is discharged by light, and only by development with spirit and water, or, with long exposure, by the former alone gives positives.

It can be used for zincography, photo-lithography, and three-colour printing. For zincography it is used as follows: 10 parts of Chinese turmeric should be dissolved in 100 parts of alcohol. If chloroform is used instead of alcohol, more soluble matter is extracted, and with the addition of 5 parts of oil of lavender it withstands acid better, and the solution is more sensitive. In order to judge better of development, 2 parts of a saturated alcoholic solution of methyl-violet should be added. The image thus obtained is quite as resistant as asphalt, if not developed. The development is effected with alcohol. Although this process can be used for zinc etching, it presents no advantages over the albumen or fish-glue processes.

For photogravure it possesses the following advantages:—It does away entirely with the costly carbon paper and its concomitant disadvantages of slow drying after sensitising and slow development, the formation of blisters, and the difficulty of seeing the image in the etching bath.

It must not be assumed that there is any difficulty in coating the turmeric solution, or that the asphalt will dissolve. The asphalt grain is rendered insoluble by the heating and by exposure to light.

For photo-lithography, ordinary litho paper is coated with the above-mentioned turmeric and lavender solution, dried and exposed.

Then the paper is squeegeed to a zinc plate moistened with spirit, or to a stone moistened with water; these are then warmed from below till the resin has melted, and then the paper removed by damping, and the zinc or stone moderately etched. For zinc, the etching solution is composed of

Water	1000 parts.
Gum solution (1 : 5)	100 „
Nitric acid	15 „

for a stone, of

Water	100 parts.
Gum solution	40 „
Acetic acid	10 „

The stone, when long runs are required, is inked up, and again etched. The advantages of this process are that it does away with the inking up of the print, the wearisome washing of the print, the delicate development of the print, and the difficult transfer.

For three-colour printing the following may be used as a filter for the blue negative:—

Chloroform	100 parts.
Turmeric	15 „
Dragon's blood	1 part.

The solution is allowed to stand for twenty-four hours, and then filtered.

This process may be also be used for printing from negatives in the ordinary way, and by substituting other light-sensitive resins, such as asphalt, guaiacum, dragon's blood, and so on, various shades may be obtained.

Black Varnish.—Herr Fleck strongly recommends the following as possessing several advaatages over the ordinary formula:—

Sandarac	10 parts.
Absolute alcohol	100 „
Nigrosin (five per cent. alcohol solution)	10 „

A Rival to Herkomer's "Artist-engraving" Process.—It is reported that a Swiss named Zürcher has discovered a process which gives far more successful results than Professor Herkomer's new (?) process, and that he has sold it to three Amsterdam firms.

Dead Black Varnish.—The following formula is suggested as giving an absolutely dead, lustreless surface:—

Water	500 parts.
Borax	15 „
Shellac	30 „
Glycerine	15 „

Dissolve and add—

Aniline black	60 parts,

and apply with a brush.

Reducing Fog.—Chemical fog, according to the *Photographische Archiv*, may be eliminated by immersing the fixed and well-washed negative in:—

Sulphate of copper	5 parts,
Potassium bromide	5 „
Water	500 „

for about half to one minute, or until the surface is just bleached, then refixing. The negative, after this treatment, can, if necessary, be intensified.

Ferric Sulphate as Restrainer. — Le Roy, in the *Bulletin de la Société Française*, suggests the use of ferric sulphate as a restrainer in the ferrous-oxalate developer, and states that it is better than using an old developer, as its action is more certain. About ten or twenty drops of a ten per cent. solution should be added to each ounce of the developer. Ferric sulphate, or persulphate of iron, as it is usually called, is quoted at 2*s.* 6*d.* per pound.

Varnishing Films.—Balagny recommends giving cut films a coating of three per cent. amyl-acetate collodion, to which about two per cent. of castor oil has been added. The film should be fastened by pins to a board, and brushed over with the above varnish, a narrow margin being left untouched. When the varnish is dry, the film should be turned over and treated in exactly the same way. He states that films treated in this way will not curl.

To Blacken Steel and Iron.—In *Science Pratique* a mixture of

Mercuric chloride	2 parts,
Cupric chloride	1 part,
Hydrochloric acid	6 parts,
Alcohol	5 „
Water	50 „

is suggested for blacking steel. The article should be well cleaned and immersed in the above for a few minutes, allowed to dry and then placed in boiling water for half an hour, and the operation repeated if not black enough.

A Reducer for Chloride Prints.—Over-printed proofs on collodio or gelatino-chloride paper may be reduced by immersion in a bath of

Hypo	10 parts.
Sol. ammon. bichromate (one per cent.)	2 „
Water	100 „

THE PHOTOGRAPHIC NATURALIST.

III.—Geological Photography.

Introductory—The Camera in Topography—Photography of Rock Scenery—Photography and Vulcanology—Subterranean Photography—Museum Photography—Photography of Rock Sections—Conclusion.

Introductory.

In former papers* an attempt was made to summarise the various methods of utilising photography in the two chief departments of natural history, viz., botany and zoology; but there still remains to be described the application of photographic methods to the study of the inanimate world. The employment of photography, both in physiography and in geology, has, of late years, assumed a new interest, owing to the rapidly increasing use of the camera for the purpose of illustrating geological memoirs. It is true that the great perfection of modern photo-mechanical processes of block production is mainly responsible for the impetus which has been given to geological photography; but the result is, nevertheless, the same, the services of photography can no longer be dispensed with by the competent geologist, either in the field or in the laboratory. The timely recognition of this fact led the British Association, a few years ago, to appoint a committee for the purpose of securing to geology the full advantages of the spread of amateur photography amongst the numerous natural history societies scattered over the length and breadth of the country. The recommendations of this committee are easily accessible, and need not be recapitulated here. The result of their efforts has been to accumulate a large mass of photographs, many of them of exceptional interest and value, which might otherwise have been lost to the scientific world. These photographs, arranged in Zaehnsdorf's self-binding mounts, are destined to be placed in the library of the Museum of Practical Geology. They treat of almost every department of geology and physiography, of inland erosion by wind and water, sea-coast erosion, cavern formation, basaltic structures, glacial erosion, fossils *in situ*, and all forms of earth sculpture. But, although the invitation of the committee has met with a fair response, much yet remains to be done, and there is a good opening for photographers, both professional and amateur, to assist in making the series as complete as possible.

As examples of the great value of photographs for illustrating geological memoirs, we may refer, amongst many others, to the proceedings of the Geologists' Association, which are often most effectively illustrated by blocks from actual photographs, as well as to the beautifully illustrated reports of the United States Geological

* See The British Journal of Photography, vol. xlii.

Survey, and the valuable work of Savile Kent on *The Great Barrier Reef of Australia*, not to mention earlier productions, such as *The Monograph on Echini*, illustrated in 1872, by Professor Agassiz, by means of carbon prints, and Johnston-Lavis' book on the volcanoes of the Lipari Islands. The Museum of Science and Art, Dublin, displays a fine series of geological photographs, chiefly the work of amateurs, presented to the Geological Survey of Ireland.

We will now examine more closely some of the special applications of photography to geological investigation.

The Camera in Topography.

In every geological survey it is of the utmost importance that the topography of the district should be as accurately delineated as possible. To do this by the usual methods of triangulation involves an immense expenditure of time and energy, quite out of the question where large districts have to be rapidly surveyed. But in photography we have a means of securing this object, not only with great rapidity, but also with any required degree of accuracy, an inestimable advantage when working in a district which has not previously been mapped.

One of the novelties exhibited at the Chicago Exhibition was a photographic map of the Rocky Mountains Park of Canada. This map was made up of twelve sheets, each covering an area of about sixty-three square miles, and every measurement usually made upon the ground itself, was obtained from photographs by the application of the laws of lens perspective.* The photographs were made from seventeen stations to each sheet, each station being visible from at least two others.

This development of photography, pointed out more than thirty years ago by Chevallier and others, has attracted more attention in France and Germany than in this country. Although it has not, for various reasons, supplanted the older methods of mapping, yet for rapid surveys in open country it promises to be of immense advantage to the geologist.

Quite recently a camera has been specially designed for geological survey, by Mr. J. Bridges Lee.† A photographic camera is fitted with a magnetic needle, carrying a vertical transparent scale divided into 360 degrees. The lens carries two cross fibres intersecting at right angles. On accurately levelling the camera by levelling screws, any photograph taken by it has automatically recorded upon it the image of the fibres, showing the true bearing of the vertical plane through the centre of the lens, as well as the horizontal plane at right angles to it. The camera carries a telescopic finder with crossed fibres, and revolves on a graduated circle, by means of which it can be turned through any desired angle.

Camera surveying has also been recently adopted by Dr. Otto J. Klotz in mapping the Baird Glacier, Alaska.‡ Any camera can be adapted, with little trouble, for this purpose, if the surveyor is provided with a Galton's pocket altazimuth, or even an ordinary prismatic compass; but the complete discussion of all the details involved would occupy more space than can now be given to it.

One of the great difficulties of a photographic survey is the impossibility of recognising the same point in the different photographs from which the results are plotted. This makes it absolutely essential that the same person should both take the photograph and plot the work. It would materially increase the permanent value of geological photographs in general if, in all cases, the true compass bearing of the camera were registered at the time of taking the view.

Photography of Rock Scenery.

Geological photographs should show as far as possible the characteristic features of the various rocks and their influence upon scenery. The nature of the rock, for example, has an important influence upon the contour of mountain masses. The profile of a limestone mountain, possessing what Leslie Stephen calls the "writing desk formation," the ruined masonry appearance of dolomite, the sharp spikes of "aiguilles" and the massive flat-topped outline of a granite boss, these are examples of the points in a mountain photograph which appeal to the eye of the geologist.

Unfortunately, there is often some considerable difficulty in properly rendering distant views of mountainous country. A lens of short focus is useless for this purpose, and a twelve-inch lens is rarely at the command of the geologist, who must of necessity be as lightly equipped as possible. Donkin recommended the simple device of halving a symmetrical combination, with the result of doubling the focal length of the lens. The swing back also comes into prominence in mountain work. There is a tendency to tilt the camera upwards, and, if the back is not vertical under these circumstances, the effect will be to flatten the mountain to a marked degree. In the same way the slope is exaggerated by leaning the ground glass forward. Burton, in producing photographic illustrations for his work on *The Volcanoes of Japan*, was impressed with the importance of paying special attention to atmospheric effect. His advice is to resist the natural temptation to photograph mountains when the atmosphere is clearest, but to choose a time when there is a certain amount of haze. Otherwise no true idea of size or grandeur can be obtained, the photograph looking more like the picture of a model only. The idea of distance is also helped by the proper selection of a foreground.

Another difficulty in photographing distant mountains is the tendency for the outlines to merge into the sky, an evil which is often remedied by the use of the yellow screen and orthochromatic plates. Where there is much snow or glacial ice, it becomes still more difficult to preserve those good half-tones upon which the success of a picture depends. Mrs. Main recommends in this case the use of slow plates with a small stop and full exposure, taking care to take such photographs in sunshine rather than in dull weather. Glaciers especially reflect a bluish light, most difficult to deal with satisfactorily unless the yellow screen is used.

J. Vincent Elsden.

(To be continued.)

* *American Annual of Photography*, 1895, p. 88.

† *Geological Magazine*, January 1895, p. 44.

‡ *American Journal of Geology*, vol. iii. No. 5, July 1895, p. 112.

PHOTOGRAPHS IN "NATURAL COLOURS:" SELLE'S PROCESS.

The inventor of this process, Dr. Gustav Selle, of Brandenburg, thus describes his improvements in the production of "photographs in natural colours:"—

The present known processes for producing photographs in colours are, broadly, of two kinds. In Lippmann's process, the coloured image is produced on one plate only in interference colours, whilst, in the other method, the coloured photograph is produced by superposing three single coloured images, produced with artificial colours one upon the other.

In Lippmann's process the photography of living or moving objects seems practically excluded, on account of the necessarily long duration of exposure, whilst, in the process described in the present specification, which belongs to the second category on account of the relatively short duration of exposure, also objects which are quiet only for a short time can be photographed in colours. In this present method it is neither necessary to make for each copy of the photograph a new exposure, as in Lippman's method, nor is the production so difficult and circumstantial as, for example, in the Vogel-Ulrich method, in which must be produced coloured plates from which printed impressions are made.

The present process is divided essentially into two parts.

1. The production of the negative.
2. The production by copying of the positive.

The production of the negative is made in the known manner by photographing an object three times, one after the other—first, behind a red; secondly, behind a green; and, thirdly, behind a dark blue, light filter.

The positive is produced by making three positives behind the corresponding three negatives, each being then coloured in the colour complementary to the light filter of its corresponding negative, and by putting these three positives one over the other.

Such a complementary positive is made by covering with a thin collodion skin, serving as image carrier, a glass plate, which is surrounded with a rim of gelatine solution, and then pouring over the same plate a chrom-gelatine emulsion.

After having dried the plate so prepared, it is exposed behind one of the three negatives, for example, the negative I. for red, then washed in cold water, and put into a colour solution complementary to red, for example, in a colour bath of methyl blue.

The plate remains in this bath until the blue image is completely developed, whereupon it is taken out, dried, and covered with collodion.

In the same manner a second positive is produced by exposing a second glass plate prepared in the same manner behind the negative II., taken with the green light filter. This is now developed in a colour bath complementary to green, for example, in one of fuchsin, and finally treated exactly as the blue one.

In the same way is produced behind negative III. the positive III., which is developed in a colour bath complementary to blue, for example, in one of helianthin.

When all three positives are produced, they are superposed as follows:—

The edges of the rose image II. are cut, and a transfer paper is squeezed upon it; the thin collodion skin is taken off with the paper, and transferred upon positive I. (blue), which has been previously covered with gelatine as adhesive substance, the two images are put one upon the other, pressed together, and transfer paper is taken off. In the same way the positive III. (yellow) is transferred on the upper of the other two.

and a positive in natural colours is thus produced, which consists of collodion or other thin skins, and can be easily transferred to a permanent support of paper, opal, glass, &c.

The inventor's claims are for: 1. A positive process for producing coloured photographs, comprising the employment of very thin but transportable collodion skins as image-carriers, which are treated with chrom-gelatine emulsion, whereupon, after exposure behind corresponding negatives, the soluble salts are washed out in cold water, and the image made sensitive in this manner for colour baths is developed in corresponding colour baths. 2. In the method described in Claim I, the production of photographs in natural colours in the known three-colours system, by putting single coloured collodion skins produced according to Claim 1 one upon the other.

PHOTOGRAPHS IN COLOURS: LUMIÈRE'S PROCESS.

Messrs. A. & L. Lumière, of Lyons, have patented "an improved photographic process giving, without transfer, images with their half-tints, and the application of this process to photography in colours."

The process is thus described:—As is well known, Messrs. Cros and Ducos du Hauron's method of photographically obtaining colours consists in producing three negatives of the same object, each negative representing the negative image of the red, yellow, and blue radiations emitted or reflected by the said object, each of these negatives being then used for obtaining a monochrome image in either red, yellow, or blue. The superposition of these three monochromes reconstitutes, therefore, the colours of the original.

This process has not hitherto been practically adopted, as the obtaining and superposition of monochromes have presented great difficulties.

This result has, nevertheless, been accomplished by the communicators by the employment of the following photographic process using bichromated mucilages.

They have remarked that bichromated glue, soluble in a cold state, which does not give the demi-tints when it is employed alone, acquires this property when insoluble substances are added to it under certain conditions. If, for example, to a ten per cent. solution of glue there is added about five per cent. of bichromate of ammonia, and from about five to ten per cent. of bromide of silver emulsion, and that this preparation is spread in a thin layer upon a glass plate, there is obtained a sensitive surface which is exposed to light under the negative to be reproduced. When it has been sufficiently exposed, the plate is washed in cold water, and there is thus obtained an image scarcely visible, furnished by the glue which has been rendered insoluble, and which can be coloured with suitably chosen colouring matters.

The bromide of silver is removed by a suitable solvent—hyposulphite of soda, for example.

This process gives, with the greatest facility, positives of all the colours with all the graduations of tints of the negative.

The colouring matter can also be added before spreading the sensitive substance on the glass or other support, and a complete positive obtained by simple washing in cold water.

The patentees' claims are:—1. The employment of bichromated mucilages soluble in a cold state to which suitable insoluble substances are added, for the production of photographic images without transfer, with all their demi-tints, these substances being afterwards eliminated by suitable solvents or allowed to remain in the layer, substantially as herein described. 2. In the photographic process herein described, the employment of gelatine and other mucilages soluble in lukewarm or tepid water, substantially as herein described. 3. The employment of the process without transfer herein described for obtaining proofs in colours upon glass, paper, or other support, by the successive impression on the same plate of three monochrome images obtained from three negatives, substantially as herein described. 4. In the production of photographs in colours, the employment of the process herein described.

RÖNTGEN'S PHOTOGRAPHY OF THE INVISIBLE.*

When electric sparks are caused to pass between terminals enclosed in a glass bulb, and the air is gradually removed from the bulb by means of a suitable pump, a series of phenomena present themselves to view. First of all, as I will now show you, as the exhaustion proceeds, the spark which, to begin with, was thin, broadens out into a description of flame; next the flame disappears, and the whole bulb becomes filled with pale phosphorescent light, the colour of which is dependent upon the nature of the residual gas. Bulbs exhausted to this degree, and containing different kinds of residual gases, are known as Geissler tubes, and in them the luminescence under the electric discharge is believed to be due to violent commotion and frequent collisions among the molecules of the residual gas, which, owing to the exhaustion, are much further apart, and are therefore much more free to move about than they are in the case of gases at ordinary atmospheric pressure.

If the exhaustion be continued considerably beyond the point to which Geissler tubes are exhausted, there is again a change in the phenomena. As will be seen in the tubes that I am now connecting, the small amount of air that still remains in the tubes is practically non-luminous, but the glass itself is now luminescent, more especially at a point which is directly opposite the plate terminal inside the tube that is connected with the source of negative electricity. Further, I will show you tubes in which certain phosphorescent substances—such as the sulphides of calcium and strontium—are placed inside the tube opposite the negative terminal or cathode, as it is called; and you will see that, under the influence of the discharge, these substances luminesce with great brilliancy, and with different colours, according to their material.

These tubes are Crookes' tubes, and it is to the labours and great experimental skill of Professor Crookes that we owe much of the knowledge that we have as to these phenomena.

As I mentioned to you, in order to produce luminescence in the phosphorescent substance placed inside the tubes, it is necessary that this should be directly opposite the cathode terminal, and the luminescence is, as a matter of fact, due to some form of emanation that proceeds in straight lines from the cathode terminal normally from its surface. That this is the case can be seen from the behaviour of the Crookes' tube that I will now put into operation. In this tube there is a screen of aluminium, in the form of a cross, which can be so placed as to be in the direct line between the cathode terminal and the glass. As you will observe when I turn on the electric current, the cross casts an intense shadow on that portion of the glass that it screens from the cathode rays. This tube also serves to show another phenomenon peculiar to these tubes. I will now remove the aluminium cross, and allow the rays to strike upon the whole surface of the glass; where previously there was a dark shadow of the cross, you now see a bright image of the same form. The explanation is this, after the glass has luminesced for a certain time under the action of the rays, it becomes fatigued, and until it has had a rest will not light up so brilliantly as before. That portion of the glass which, in the first experiment, was protected by the cross, is less fatigued than the remainder, which has been luminescing for a longer time; consequently it is now more brilliantly luminescent than the more fatigued portion.

The cathode rays are also capable of doing actual mechanical work. I have here one of Professor Crookes' tubes, which contains a small mill with inclined mica vanes similar to those used in Crookes' radiometer, The cathode waves, as you see, cause these vanes to rotate rapidly, making them at the same time luminesce with beautiful colours, due to the rare earths with which they are coated.

What the cathode rays really are is a matter of some doubt. The fact that they can be deflected by a magnet, as I will show you, seems to support the theory held by Crookes himself, and by most English scientists, that they consist of streams of electrified particles of matter, probably particles of the residual gas, which, being negatively electrified, are violently repelled from the negative electrode, and, being in this way projected across the interior of the tube, produce luminescence of the glass or other substances by their bombardment. It may be perhaps thought that the exhaustion in tubes of this description is so high that there cannot be a sufficient number of molecules of residual gas left to countenance such an explanation. According, however, to a calculation of Professor Lodge, and assuming the tube that I hold in my hand has ten inches cubical content, and further assuming the exhaustion of this tube is so good that only one hundred-millionth of the original atmospheric pressure remains, which I may say corresponds to about one 500th of an inch in a barometric column three miles high, assuming all this, there are still some sixteen thousand billion molecules of residual air left in the tube.

However, just as in medicine it is at present the fashion to attribute all diseases to microbes, so, especially among Continental scientists, it is now very fashionable to attribute most things to wave motions in the ether; consequently there are many eminent scientific men, both here and more especially abroad, who do not uphold the Crookes' theory of radiant matter, but who imagine that the cathode rays are more nearly akin to light or sound.

So far we have been dealing with what takes place inside the tube, and till a few years ago it was not known that, apart from the light that emanated from the tube and was visible to the eye, there was anything further. Some three years since, however, Lenard discovered the interesting fact that it was possible to bring the cathode rays outside of the tube by inserting in the latter an aluminium window. He had noticed that glass was exceedingly opaque to these radiations, and he argued that it was due to this that the radiations were not able to find an exit into the external vicinity of the tube. Lenard not only anticipated Professor Röntgen in this respect, but he also succeeded in obtaining actual photographic impressions through various substances by means of

* Continued from page 168.

the cathode rays. He noticed that some of these rays after they had left the tubes, were deflected by a magnet, and that others were not, that they appeared to pass without difficulty through many substances which, to ordinary light, were entirely opaque; in fact, he did some three years ago a large number of things which recently have been accepted by the public as entirely novel.

Röntgen, on the other hand, deserves the undoubted credit of having discovered what is certainly the most remarkable, and probably at present, the most useful purpose to which photography, by means of these radiations, can be put. He found that, owing to the fact that bones are more opaque to these radiations than flesh, it is possible by their means to obtain accurate pictures of the bones in the living body. It must be understood that these pictures—some of which taken by myself I will shorty throw upon the screen—are obtained without the use of any camera or lens. They are, in fact, merely shadow pictures. They differ, however, from the ordinary shadows that would be cast by the hand or other portion of the body being interposed between a source of light and a screen, in that with the Röntgen rays the bones cast a more dense shadow than the flesh, and are, consequently, visible through the latter on the developed photograph. Similarly metallic objects enclosed in a wooden box, or coins in a purse, cast more intense shadows than the wood of the box or the leather of the purse, and thus impress their images upon the photographic plate.

Further, it must be understood that Röntgen, in his experiments, employed no aluminium window to his tube, and it is a question whether his rays are really at all of the same nature, as Lenard's cathode rays, on passing through the glass walls of the tube, become converted into something else, or that a portion of them—that portion that is deflectable by a magnet—are, as it were, filtered out. In any case, the Röntgen rays have many peculiarities. They penetrate with little difficulty many substances which, to ordinary light, are quite opaque. They penetrate metals with difficulty, though all metals in sufficiently thin sheets appear to be more or less transparent to them. The heavier metals are most opaque, and aluminium, which is one of the lightest of metals, is one of the most transparent. They pierce most organic materials with ease, and, apparently, without much regard to their colour. For instance, ebony does not appear, in any appreciable extent, to be more opaque than pine. Ebonite, vulcanised fibre, black paper, and other substances which are entirely opaque to ordinary light, are exceedingly transparent to these rays, while glass, fluorspar, and other substances that are very transparent to light, to these rays are remarkably opaque. In fact, the opaqueness or transparency of substances to ordinary light is no guide whatever of their transparency to the Röntgen rays, and, as has recently been discovered by Professor Dewar, the true fact of the case seems to be that the transparency of substances to these rays is inversely proportional to the atomic weights of their elementary constituents. This connexion with gravity is most interesting, for, while on the one hand it supports the theory that these rays are not similar to light, but more resemble streams of minute projectiles which are more or less arrested in their course by the inertia of the particles of the target against which they are thrown, on the other hand, it has long ago been suggested that gravitation may be due to a longitudinal wave motion of the ether.

A. A. C. Swinton, A.M.I.C.E., M.I.E.E.

(To be continued.)

THE W. H. HARRISON FUND APPEAL.

	£	s.	d.
First List of Contributions	8	19	6
Mrs. Nelson Decker	0	10	6
H. Snowden Ward	1	1	0
Andrew Pringle	1	1	0
	£11	12	0

Further contributions will be thankfully acknowledged by

Fredk. H. Varley, 82, *Newington Green-road.*

The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* Journal *useful and instructive.*

Chlorophyll.—W. H. G. writes: "For various purposes, during the past few years, Mr. F. E. Ives has recommended the use of chlorophyll prepared from the leaves of the blue myrtle. As I notice that that gentleman is or was recently in this country, I should be extremely obliged if he could give me any information regarding the shrub in question, as I have made inquiries in various quarters without finding anybody who knows anything about it. Is it a native of America only? or, if it grows in this country, can Mr. Ives say by what name it is known here, as several nurserymen I have applied to do not know it by the name given above? Again, I should like to ask Mr. Ives if the virtue of the blue myrtle lies in its giving a product differing in spectrum qualities from ordinary chlorophyll, or whether it is only a richer source of that substance. Also, if I am not troubling him too much, I do not remember to have read a description of his method of preparing the chlorophyll solution. Is it necessary to extract the pure chlorophyll, that is to say, to free it from its waxy and other impurities, or will it suffice simply to draw out the colouring matter by digesting a quantity of leaves? If the latter will do, then I think alcohol or a mixture of alcohol and ether will be found preferable to ether alone, owing to the greater solubility of the chlorophyll in alcohol; but, if it is needful to remove the waxy constituents, the presence of alcohol will interfere with their ready separation. If Mr. Ives, or any other of your readers, could advise me on these points, I should be deeply obliged."

Colour Screens for Orthochromatic Work (To Mr. F. H. Burton).—"This gentleman, in an article, recently, alludes to the aqueous solution of chromate of potash as being, so far as at present known, the most reliable agent for cutting off the violet and ultra-violet rays. Which chromate of potash? The neutral, or the acid, or dichromate? These, as every one at all acquainted with chemistry knows, are salts of very different colours, the one being a pale lemon yellow, the other a deep red; and, though the latter, in *weak* solution, shows very little of the red colour, it is still strength for strength—in volume, at least—much deeper than the neutral chromate. Taking a solution of five grains of each in three ounces of water, which is about the strength recommended by Mr. Burton, it is necessary to dilute the bichromate to three times the volume before the colours of the two solutions approximate, when an ordinary china teacupful of each are placed side by side; but, if coffee cups be taken, then the bichromate is the darker. Similarly, owing to the much greater tinctorial power of the neutral chromate, the more the solutions are diluted, or the thinner the layer of solution, the darker, proportionately, does the latter appear—it falls off, in fact, to a far less degree than the bichromate. Independent, then, of the fact that the absorption spectra of two solutions visually apparently equally dense must vary more or less, it is important to be sure which of the two salts is to be used in the proportion of one to three hundred."—C. P. R.

Collodio Chloride Paper (To "Wet Plate").—You should find less difficulty in arriving at a solution of the problem you have set yourself than in preparing a paper to be toned in the ordinary way. There is not the least difficulty in preparing an emulsion that will give any desired degree of contrast, or that will work well with either thin or dense negatives, as may be required; but the difficulty is to get the image to tone well on the ordinary gold bath. That necessity removed, it is pretty plain sailing. A formula something like the following will answer:—

Pyroxyline	4	grains,
Calcium chloride	2½	„
Citric acid.....	3	„
Nitrate of silver	12½	„

to each ounce of ether and alcohol mixed in equal parts; that is to say, those are the contents of each ounce of emulsion. I presume "Wet Plate" understands how to mix them. With such an emulsion the development can be effected in the same manner as with gelatino-chloride, either with a preliminary soaking in bromide of potassium solution, or with such a solution as that recommended for Solio paper, containing a very large proportion of bromide. It is best suited for negatives of medium density, and may want a little modification for very thin or very dense ones. But that is too wide a subject for this column."—Syntax.

Films of Pure Silver Bromide (To Syntax).—"Latent images produced in films of pure silver bromide cannot be developed by the alkaline method. (See Cantor Lectures by Prof. Meldola, March 1891.) In a pure film of bromide, or in the case of a solid mass, such as "Syntax" describes, the whole of the

molecules are in contact with each other, and chemical reduction commencing in any one part of the film can spread throughout the whole, any image being thereby lost. In a gelatine bromide film, which contains a number of isolated particles separated from each other by gelatine, only such particles as contain a nucleus of light altered molecules are developable, and the action cannot spread beyond the confines of the particle. The image is therefore preserved. There is also another point to consider:—The effect produced by exposure varies according to whether a sensitiser is present or not. With gelatine there is little doubt that some small portion of bromide is actually removed from the bromide and absorbed by the gelatine which afterwards readily yields it up to the developer. The result is that even a very short exposure leaves a developable nucleus in the particle. If, however, no sensitiser is present, the bromine is not actually separated, but remains in the immediate vicinity of the light product, to which it is still, to a certain extent, attracted. It then acts as a powerful restrainer upon the chemical reduction of the light product, which, under these conditions, is reduced with as much difficulty as if it had never been exposed at all. Light alone may be considered to simply shake up the molecule of silver bromide, the atoms of which are loosened and rearranged in a different, but not necessarily developable, form. If, however, a sensitiser is present, it seizes the opportunity, afforded by the disturbance, to abstract an atom of bromide, and keeps it. The residue is then easily reducible. Fused silver bromide is, no doubt, much less sensitive, either to light or development, than a simple film, hence the difficulty experienced by 'Syntax' in producing any effect with a normal developer. The latent image on pure bromide of silver is developable by the physical or accretional method. The visible image is then built up upon the original latent image, which probably does not undergo any chemical reduction at all."—C. Welborne Piper.

I have just noticed one of your readers inquiring the best means of securing a situation as retoucher in Chicago. The problem with retouchers and others in the photographic business here is how to get out of it. Business is very, very quiet, and a good deal of my time is taken up advising people to keep out, or get out, according to circumstances.—A Scot in Chicago.

Foreign Patents.—W. W. says: "Would you kindly give me the following information:—I intend, in a few weeks, making provisional application for a patent. Would you kindly let me know the cost for America, France, and Germany, and if I can get provisional protection the same as for a British patent? Also, after having obtained a British patent, must I take out the foreign patents at once, or how long can I wait?"—The information our correspondent seeks is best obtained from a patent agent; but perhaps some of our readers may be able to supply it.

News and Notes.

Royal Photographic Society.—Technical Meeting. Tuesday, March 24, at 12, Hanover-square, at eight p.m. *The Relative Colour-sensitiveness of Ordinary and Isochromatic Plates*, with a demonstration, by Mr. F. E. Ives.

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, March 25. Travellers' Night. *Lincoln Cathedral*, with lantern illustrations, by Mr. Fred H. Evans. Afterwards a set of slides, by Messrs. R. W. Thomas & Co., Limited, illustrating their new anti-halation plate, will be passed through the lantern.

Mr. G. Abbott, of the Natural History and Philosophical Society, Tunbridge Wells, writes: "I forward you a programme of the Congress to be held here next April. Our main object is to bring about a union of all the scientific societies in the south-east of England. By this means it is thought that each Society could and would co-operate in many ways for mutual advantage. Photography is so important to all our natural history societies that I hope many of the amateur photographic societies may join us. We look forward to the time when the whole of the United Kingdom will be covered by such unions, under the immediate patronage of the British Association."

An International Exhibition of Photography, pictures, transparencies, apparatus-appliances, and photo-mechanical work will be held in the Great Hall of the Society Vereeniging, Harlem, Holland, from May 16 to 26, 1896, under the patronage of His Excellency Baronet J. W. M. Schrorer, Commissary of H.M. the Queen of Holland, and Baronet J. W. G. Boreel van Hogelanden, Mayor of Harlem, organized and managed by the Harlem Amateur Photographic Club. The International Committee consist of Messrs. Walter D. Welford, London; Ernst Juhl, Kunsthalle, Hamburg; Maurice Bucquet, Paris. Special notice.—All communications from British exhibitors must be made to Mr. Walter D. Welford, *Photographic Review* Offices, 15, Farringdon-avenue, London, E.C., who will supply forms and all information, and receive the entries, entry fees, and pictures.

On Saturday evening last the premises of Mr. J. R. Gotz, 215, Shaftesbury-avenue, were burglariously entered, and a half-plate Psycho camera and four lenses stolen. The matter has been placed in the hands of the Bow-street police officials. The numbers and description of the lenses are:—

Zeiss anastigmat, by Suter ..... No. 12,219,
Ser. 1, 7·2, No. 5;
" " " ..... No. 12,213,
Ser. 1, 7·2, No. 4;
" " " ..... No. 11,305, No. 2;
And Suter rapid aplanat, eight inches ..... No. 15,314.

North Middlesex Photographic Society.—This excellent and flourishing Society held its annual dinner at the Holbern Restaurant on Saturday, March 14. The President of the Society (Mr. J. C. S. Mummery) was in the chair, and among those present were the Rev. F. C. Lambert, Mr. Debenham, Mr. Chapman Jones, Mr. Child Bayley, Mr. Wall, Mr. Bedding, Mr. J. A. Sinclair, Mr. Golding, Mr. W. B. Goodwin, Mr. C. Beadle, and many other members and friends. The toasts included "The North Middlesex Photographic Society," "The Officers," "The Press," "The Visitors," &c. In the course of the evening the certificates gained at the recent Exhibition of the Society were handed to the winners by Mr. Lambert, who was one of the Judges.

The New Photography.—The hitherto unaccomplished task of passing Röntgen rays right through the human body has been performed by Dr. Hall-Edwards, of Birmingham, who, with an adult subject, has obtained photographs showing the backbone, with the vertebræ and the spinal cord in full detail. Dr. Hall-Edwards has, before the local postal authorities, successfully used X rays for detecting coins in newspapers, embedded in sealing-wax, and otherwise posted contrary to regulations. By the aid of the Salvioni Crytoscope objects were seen through hundreds of thicknesses of paper.—Mr. A. F. Stanley Kent, of St. Thomas's Hospital, working on the same lines as Professor Röntgen, has succeeded in transmitting the X rays completely through the body, and the condition of such organs as the kidney can be investigated. The photographs which have been so far taken show those portions of the body lying between the fifth rib and the pelvis, and there are distinctly visible in these photographs the bones of the pelvis, the spinal column and the lower ribs. The space occupied by the kidney itself is slightly more transparent in the negatives, thus indicating that the kidney itself is rather denser than the surrounding tissues. As there seems some doubt as to the opacity of the renal calculi, Mr. Stanley Kent took photographs with a view to clear up this point. It was found that, although there is a considerable difference in the relative transparency of the different stones, all of them are sufficiently opaque to render it possible to differentiate them clearly from the surrounding tissues.—Mr. Edison professes, according to a Dalziel's despatch, to have discovered a chemical substance—out of one thousand eight hundred which he tried—which enables the Röntgen shadows to be seen directly by the naked eye, with the result that the physician may soon be able to study his patient alive as he now does at an autopsy. In practice the patient would stand between the apparatus and a screen, out of sight of the physician so far as the ordinary light is concerned, but his skeleton would be revealed on the crystal side of the screen, and the fat and muscles would be indicated by variations in the density of the shadows. Physicians will, Mr. Edison asserts, be able even to trace the presence of consumption, because of the difference in solidity shown by the diseased and healthy parts of the lung. He declines to divulge the nature of his chemical.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
23	Croydon Camera Club	Rehearsal of Slides to be shown on 25th.
23	Lantern Society	*The Scottish Alps.* W. Laymond Howie.
23	North Middlesex	*Photography and Book Illustration.* A. J. Johnson.
23	Richmond	Demonstration. P. Broomhall.
24	Brixton and Clapham	*Retouching, and the Improvement of Negatives.* Part II. Landscape Negatives. R. C. Whiting.
24	East London	Platinotype Printing by the Company.
24	Hackney	*Trip to Lucerne and Venice.* W. Fenton Jones and others.
24	Royal Photographic Society	*The Relative Colour-sensitiveness of Ordinary and Isochromatic Plates.* F. E. Ives.
25	Borough Polytechnic	General Meeting.
25	Croydon Camera Club	Twenty-fifth Public Lantern Show.
25	Leytonstone	Members' Lantern Evening.
25	Photographic Club	*Lincoln Cathedral.* Fred H. Evans.
26	Ashton-under-Lyne	*A Ramble in Far Lochaber and Ultima Thule.* Dr. A. Hamilton.
26	Bradford	Members' Quarterly Competition.
26	Ireland	Photograph c Topics.
26	Leeds Camera Club	*The Chemistry of Photography.*—IV. Lantern Slides. Dr. J. T. Thresh.
26	Leigh	Lantern Evening.
26	Liverpool Amateur	*Five Hundred Miles up the Nile.* David Lewis.
26	London and Provincial	Lantern Evening.
26	Oldham	*Round about Crowland.* J. Chadwick.
26	Woolwich Photo. Society	*Mounting and Framing.* J.C.S. Mummery.
27	Croydon Microscopical	Conversational Meeting.
27	West London	Members' Lantern Evening.
28	Birkenhead Photo. Asso.	Social Evening and Lantern Lecture. The President.

ROYAL PHOTOGRAPHIC SOCIETY.

MARCH 17,—Photo-mechanical Meeting,—Mr. C. E Hearson in the chair

Mr. T. BOLAS exhibited a print made in 1842 by Mr. Palmer, then of Newgate-street, by his "intaglio autographic process" (patent No. 8987 of 1841), a process which was almost identical with

PROFESSOR HERKOMER'S "NEW ART."

Mr. Bolas said that, as he understood the matter, Professor Herkomer's only claim for advance on, or variation from, the method of Palmer was, that, in making the painted image conductive of electricity, he dusted it with a roughening powder which was auto-discriminative—discriminative, presumably, of the spirit or intention of the artist; but, if the Professor could fully establish this property of his powder, he would have made the first step towards a "new science"—experimental psychology—for which he would win greater fame than for his "new art." The specimen shown was one of a series painted upon silvered copper plate, by Lance, and electrotyped by Palmer in 1842, and appeared to Mr. Bolas to possess every good quality to be found in Mr. Herkomer's work, and with the advantage of reproducing the actual touch and texture of the artist's original, and this without the use of any mechanical or other discriminative device. The marvellous play of gradation obtainable by Palmer's method suggested the value of its application to the retouching of the reverse upon which an intaglio photographic plate was electrotyped, and Palmer's specification would well repay perusal. The print appeared to have a wider and fuller range of tone than was obtainable by the new art; the use of a discriminating powder (so called) only resulted in a less successful print, and Mr. Bolas thought that, in so far as Professor Herkomer's method was new, it was so much the worse. For a powder to discriminate was a miracle, a new fact in metaphysics.

CAPTAIN COLLARDON described various methods of producing

IRREGULAR GRAIN WITHOUT SCREENS.

The first method was based on the reticulation of gelatine. Autotype tissue, sensitised in a bath of three per cent. bichromate of soda and three per cent. bichromate of potassium, dried as quickly as possible, in contact with a talced glass, at a temperature of from 29° to 30° C., exposed under the negative, and immersed in water at 19° or 20° C. for about forty seconds, and here the reticulation of the gelatine was under complete control, and the longer the immersion the coarser would be the resulting grain. The copper plate was dusted with a mixture of two parts of colophony and one part each of mastic and sandarac, and the carbon tissue was then squeegeed upon it. In the second method, white lithographic ink, mixed with gold size, and thinned with turpentine, was distributed, by means of a perfect gelatine roller, over the surface of a fully exposed thin negative. The nature of the grain caused by this operation would vary with the manner in which the plate was rolled and cross rolled, and the grain could be applied, if desired, to particular parts of the negative. When the ink was dry, the negative should be varnished, and the print on carbon tissue squeegeed to a plate, dusted as in the before-mentioned process. A further method consisted in coating a plate with a soft gelatine and bichromate, exposing under a negative, soaking in water, and inking in without drying. Prints produced by each of these methods were passed round for examination. Referring to the subject of

COLOUR PRINTING,

Captain Collardon showed a print in colours, produced by a process which, he said, had been invented by an Italian gentleman, and by means of which pictures in any number of colours could be made at the rate of about six hundred an hour in two printings only and in unlimited numbers, all the colours being printed together from one plate in the first operation, and a key-block in brown, sepia, or black, by the second. The machine was at present made to work up to forty-two inches, but no difficulty was anticipated in producing much larger prints. It would be possible to reproduce on a single page of an illustrated newspaper as many as half-a-dozen pictures of different character, and each of several different colours—a wash drawing, a water colour, an oil painting, &c.—and to print them all together and in but two workings. Captain Collardon said he had actually seen the machine at work, or he would not have believed such a thing was possible; a part of it was covered up when he saw it, as the patent was not completed, but he understood the process was quite novel and entirely unlike any method at present known.

Some speculation ensued as to the method by which the colour print had been produced, and Messrs. Ives, Gamble, and Bolas made some remarks as to the advantages arising from the use of screens with broad black lines, the general opinion appearing to be that such screens, while transmitting comparatively little light, gave greater control over gradation than more open screens.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 12,—Mr. A. Haddon in the chair.

The CHAIRMAN, in reply to Mr. Beckett, said one could send a ten-inch spark through a ten-foot tube, provided the vacuum was not perfect. A perfect vacuum being a non-conductor of electricity, if the air in a tube were rarefied as far as possible, one could bring the terminals to within one-tenth of an inch without any result.

COLOUR SENSITISING.

The following question from the box was read:—"Where is there to be found instructions for sensitising dry plates for various separate colours?"

It was stated that Eder's work, *Ausführliches Handbuch*, Hübl in the *Correspondenz*, and several German works and English translations, gave instructions for doing this.

THE STIGMATIC AND DALLMEYER-BERGHEIM LENSES.

Mr. T. R. DALLMEYER, speaking of the Stigmatic lens, showed four test negatives, one taken with an ordinary portrait lens made from the old glass in which it was impossible to eliminate the curvature of field at the same time as the astigmatic error, and the other three taken with different sizes of the Stigmatic lens, made of the Jena glass, having an angle of about 60°. In the first negative distinct indications of astigmatic error were noticeable in the corners, while in the others this had been eliminated throughout. With the new Jena glass, he said, opticians had been able to get rid of both curvature of field and astigmatism. He explained by diagram how Piazzi Smyth succeeded in doing this by the use of a strong negative lens just in front of the sensitive plate, and how he discovered the method. He considered the new Stigmatic lens an advance on anything done, and that the calculations involved were very pretty. It was, *per se*, a portrait lens. He was quite prepared to say that, for a group, a lens, with slight curvature of field, if free from astigmatism, was an advantage. However, the scientific acme was to free a lens from that. In answer to a query, he said the lens must be used as a whole.

The HON. SECRETARY asked what was the rule for calculating the position of the stop in order to avoid ghost or flare. He said Miethe had stated that, if the flare was four times as great as the lens, it did not matter.

Mr. DALLMEYER said there was really no rule, and that it was an extremely difficult calculation. He described a simple optical test. Ghost and flare were very different things.

The HON. SECRETARY quoted from the Zeiss patents, in which a fraction of the focus was given as the position for the stop, and asked whether it was a complex calculation.

Mr. DALLMEYER replied yes, but, as a matter of fact, it was more or less arbitrary.

The HON. SECRETARY asked if there was any rule with regard to rapid rectilinears and flare spot.

Mr. DALLMEYER stated it was best to place the stop almost at the optical centre of the whole combination. Speaking of the Dallmeyer-Bergheim lens, he thought Mr. Bergheim had done a very great service to photographers who wished to produce work that, to them and a good many others, was distinctly artistic, and he hoped they would be grateful to him for his work. The construction was one in which there was a meniscus lens, the barrel-shaped distortion of which was cured by a negative lens at the back, the diaphragm being in front. Regarding achromatism, this lens was not achromatic. Both lenses were made of one kind of glass, and purposely left so. Mr. Bergheim had said that, from his own experience, he thought that the lack of perfect achromaticity was an advantage, in that the image was somewhat prismatic. Another feature was in the separation of the lenses, which produced very varying foci, ranging from thirty-six inches to sixty inches in the one instrument. Mr. Bergheim's main object was to do away with the retoucher's art, and attention was called to the texture in some specimen photographs handed round, all the detail being given in a softened degree without destroying the structure.

Mr. W. E. DEBENHAM did not think justice had been done to the new Stigmatic lens. When he first saw it he considered it was the one important advance in portrait lenses since the time of Petzval. We have been calling out a long time for flatness of field, although a good deal had been got by putting up with a fair amount of astigmatism. The work we had to do generally was such as would be best done with a flat-field lens, and he thought the lens a vast improvement.

The HON. SECRETARY, speaking of the necessity for flat or round-field lenses, thought you must suit your lens to the work to be done. He doubted whether one could get a lens to do everything. He had been wanting a lens which would also remove those intrusive inequalities, such as wrinkles in a photograph, which he had not got with an ordinary lens, and the nearest approach to it was an uncorrected spectacle lens.

PHOTOGRAPHIC CLUB.

MARCH 11,—Mr. Foxlee in the chair.

Mr. Freshwater showed some interesting photographs which he had made with the X rays. The special feature about these latest productions of the New Photography consists in the fact that a much larger amount of detail is delineated than in former efforts, and also that the necessary exposure has been very much reduced. This acceleration of the exposure has been effected by a modification in the radiant matter tube. Messrs. Newton & Co., who are the manufacturers, have elaborated and worked out an idea due to Mr. Herbert Jackson, of King's College. The new tube is called a focus tube, and, although perhaps, strictly speaking, this is a misnomer, yet, by an ingenious arrangement of the terminals, the light is apparently directed in such a manner as to give much crisper images than does the older form of lamps. A coil sufficient to give a two-inch spark will, with the new focus tube, emit sufficient of the new X rays to make an exposure in the average time of two minutes at a distance of five inches from the object to be shadowgraphed. With such a current there is no noticeable heating of the tube, and there is no occasion for intermittent exposure due to the tiring of the tube.

Mr. BRIDGE asked if the sharpness did not depend in a great measure upon the distance of the discs from the tube, viz., the longer the distance the sharper the image.

Mr. FRESHWATER said no, he thought not.

Mr. ISENTHALL, however, who had been making many experiments, agreed with Mr. Bridge that it was not possible to get such sharp results if the tube was too close.

Mr. Freshwater's results, which included a radiograph showing a needle in a lady's hand, and a mossy growth upon the bones of a man's hand, the skeleton of a mouse, the foot of a chicken, and also the details of a broken arm which had been improperly reset, were thought to be advances upon previous efforts.

The CHAIRMAN congratulated Mr. Freshwater upon his success, and thanked him in the name of the meeting for his very interesting results.

Mr. FRESHWATER then, in an informal manner, described his method of stereoscopic projection by means of coloured slides and properly coloured

viewing lorgnettes. He brought with him a considerable number of the latter, so that the members present had a unique opportunity of trying the method.

A series of Mr. W. D. Welford's lantern slides concluded the evening's work.

Brixton and Clapham Camera Club.—March 10, Mr. J. W. Coade (President) in the chair.—A discussion on

HAND CAMERAS

was opened by Mr. W. FRASER, who said he had read almost every book published on the subject, but had not found them of much assistance, as no two writers agreed upon the best form of camera to adopt, or the most suitable plates to use, one advising the most rapid obtainable, and another a comparatively slow plate. He then described the different types of hand cameras, and discussed their respective merits and demerits, and also those of various changing arrangements, shutters, finders, &c. He thought a rectilinear best for hand cameras, but a good single lens was much cheaper, and yet capable of turning out excellent work. He also showed a novel changing magazine of his own making. This took twelve plates in sheaths, and appeared absolutely certain and reliable in its action. As no patent was applied for, any one could copy it who desired. The discussion was taken up by Messrs. Biddell, Welham, Whittard, Kidson, and others, and many members brought hand cameras for inspection by those interested.

Camera Club.—March 12.—The meeting was unusually interesting, and, although there was only one subject announced for demonstration and discussion, that one eventually expanded itself into a many-headed two. Dr. Bowles was announced to give an account of some

PHOTO-ELECTRICAL EXPERIMENTS

which have recently been made by Lord Armstrong, and, as this part of the evening's work was concluded at a very early hour, it resolved itself into little more than the exhibition of a couple of dozen lantern slides, with short explanations of each picture. Dr. BOWLES filled up the rest of the available time with a description of some observations of his own, which were no less interesting. First, with regard to Lord Armstrong's experiments. These related to self-registered pictures of the brush discharge from a Wimshurst electrical machine, pictures taken in a dark room, without camera or lens, by bringing the electrodes over a highly sensitive gelatine plate. Very beautiful figures are produced in this way, endless variety being secured by varying the conditions under which the electricity was allowed to impinge upon the plate. By placing wires under the insulated plate, and causing those wires to carry an induced current, other effects are secured, and these are varied again by altering the positions of the electrodes. Another class of pictures was produced by covering a waxed glass plate with a very delicate layer of dust, the discharge urging that dust into all kinds of wonderful fret-work-like patterns. It was a pity that details of the method were not given by Lord Armstrong, for the lecturer laboured under the disadvantage of not having seen the experiments actually performed, and could not therefore satisfactorily answer the various questions concerning them with which he was assailed by the members of the Club. It was, however, understood that in connexion with the Wimshurst machine employed were two large condensing jars, and that it was the discharge from these, taken at the brush stage, and just before the tension had risen necessary for a spark discharge to take place, that was utilised. Some of the pictures resembled those taken some time ago under nearly similar conditions by Mr. Campbell Swinton. Dr. Bowles then proceeded to give an informal lecture upon certain observations which he had made with regard to

THE PENETRATIVE ACTION OF SUNLIGHT,

and he suggested that there was sufficient analogy between the results which he had arrived at and the action of the Röntgen rays to lead to the belief that the latter are but a modification of the actinic rays with which photographers are so familiar. The rays which afford heat, light, and chemical action are very different to one another, but not more different than they are to the Röntgen radiations. A great deal is made of the circumstance that the X rays are not refrangible. But are we right in assuming this to be a settled fact? May it not be that we have not yet hit upon the right substance to refract these unseen rays? Dr. Bowles then went on to say that for fifteen years he had been investigating the effect of light upon the human body, and especially the effect of light reflected from snow in penetrating the human skin and affecting the tissues beneath. He had come to the conclusion that what we call sunburn was not caused by heat alone, but that it was due far more to the violet, or ultra-violet, rays reflected from snow, water, mist, and other bodies. Captain Abney had found that these rays are very strong at high altitudes, and believed that altitude had much to do with sunburn. But he (Dr. Bowles) was sure that altitude alone could not explain sunburn, for one may remain unburnt on rocks at 10,000 feet and be immediately burnt on a glacier 4000 feet lower down. Not only does the skin get brown, but the wooden *châlets* get browned right through, the wood in extreme cases being actually carbonised, as he showed by a specimen which he had brought from the Alps. He believed that sunburn was caused almost entirely by reflected light, and that some hitherto unexplained physical change must take place in the light during or after reflection. He could not help feeling that there was a strong affinity between the Röntgen X rays and the actinic rays, which he had known had such powers of penetration. Dr. Bowles' remarks aroused much interest, and many of his observations were corroborated by Alpine climbers who were present, one of whom asserted that he never suffered more from sunburn than on a particular misty day, when the sun never showed its face. The meeting, which was under the chairmanship of Mr. Inwards, President of the Meteorological Society, closed with the usual vote of thanks.

Gospel Oak Photographic Society.—March 9.—This Society held an Exhibition of members' work in the Lecture Hall of the Gospel Oak Congregational Church, which was very well patronised. There were three classes, viz., (A) Portraiture and Figure Studies, (B) Landscapes and Seascapes, (C) Various. The prize-winners were:—Class A, first prize silver medal, Mr. Gittens; second, Mr. Pridham. Class B, first prize, hand camera, Mr. Bamber; second, Mr. Beyer; third, Mr. Davies. Class C, first prize, Mrs. Gittens; second, Mr. Rayner. Not the least feature of the Exhibition was the manufacturers' stall, which attracted a great deal of attention, and thanks are due to the following firms, who kindly lent their specialities:—Messrs. Thornton & Pickard, Horne, Letts & Co., Eastman's, Cresco Fylma, Wynne, Higgins, Wheeler, Tylar, Wellington & Ward, Paget Prize Company, Ilford, Elliott & Son, and Wray.

Hackney Photographic Society.—March 10, Dr. Gerard Smith presiding.—A large number of members and visitors assembled to hear and witness a lecture and demonstration on

RÖNTGEN'S X RAYS

by Mr. J. E. GREENHILL. In the course of the lecture some striking experiments were performed, and Mr. Greenhill's exposition was most lucid. A very brief summary is as follows:—Dealing with the subject of light, the lecturer said that at one time but little was known of the invisible part of the spectrum; the heat rays at the red end, and the ultra-violet rays at the other, together with the fact that these ultra-violet rays could be rendered visible or fluorescent by means of sulphate of quinine, comprised almost the whole knowledge of this particular subject up to a comparatively recent date; but the improvements in apparatus had helped to open up to later investigators an extended field of discovery, and it had been found that the visible part of the spectrum was but one-twelfth of the whole. The announcement of the discovery of the X rays had led to some controversy as to who was the first to discover their peculiar properties, and he would say in passing that there was a tendency in the times to claim a monopoly in discoveries or investigations. This was regrettable, for a true scientist should be of no nation; if he were not cosmopolitan, he was no scientist at all. Many erroneous statements had been made concerning the new rays, and hap-hazard conclusions drawn from insufficient experience of the subject. Indeed, seeing how recently the matter had first attracted attention, and the necessarily limited knowledge gained since, it was premature to pronounce on it with any positiveness; so, in describing the X rays, he would prefer to say no more than this: They are invisible, and are rendered visible by fluorescent substances, just as are the ultra-violet rays by means of sulphate of quinine. Placing a vacuum tube in the circuit of a Ruhmkorff coil, the turning on of the current caused the tube to be filled with a beautiful radiance—bluish, or violet—and most abundant at the end which held the negative pole terminal, or cathode, and yellow, and in small quantity only at the positive pole end, or anode. Mr. Greenhill showed how these cathodic rays had the same effect as ordinary light upon a radiometer. These cathodic rays were, however, not X rays, for the latter could not be produced in an ordinary vacuum tube, as the exhaustion was not high enough. A tube for the production of these must be exhausted of all but one-millionth part of its original air contents. With regard to the apparatus necessary, it was a mistake to think that very powerful and expensive electrical appliances were necessary. The best work could be done by means of a coil costing from 5*l.* to 10*l.* It was necessary to use accumulators for steady work; he knew of no primary battery suitable—all were so soon polarised. Whatever were used, the current must be strong enough to overcome the resistance of the coil. Concerning the tubes, he cautioned would-be experimenters against buying expensive tubes without having them properly tested. Newton's new Focussing Tube was a great improvement on others, and he had been using one lately with great success. Speaking of his first experiments in connexion with the subject, Mr. Greenhill said that his first successful result had been produced in one hour. In his later attempts he had reduced the exposure with superior results directly in proportion to the decrease until three minutes were reached, when the most successful results were obtained. He had found the most suitable dry plate and developer for this work to be the Cadett Lightning plate and the Velox developer. He had tried hydroquinone, but this was too slow. With the Velox, detail flashed up at once, and full density was obtained in five minutes. So much had been done nowadays in making plates sensitive to different rays that it was not too much to hope that in due course an emulsion would be made which was most highly sensitive to the X rays. Having shown some very fine negatives of the shadows of various objects, Mr. Greenhill proceeded to demonstrate. The fixed data of the experiments that evening were: Newton's focussing tube, a two-inch Ruhmkorff coil, a current of ten volts and ten ampères from accumulators, Cadett Lightning plates in black negative envelopes, and Velox developer. Mr. William Rawlings undertook the task of developing the exposed plates. All being ready, various articles, such as a razor in case, fountain pen in case, leather purse, bunch of keys, &c., were then laid upon the plate, enclosed in its envelope, and exposed for one minute to the rays from the tube, which was placed about five inches above. On development, the results were most successful. Every detail of the articles was shown in various degrees of intensity, corresponding to the resistance which the particular substance opposed to the passage of the rays. Particularly noteworthy were the chasing on the surface of the vulcanite penholder and the threads of the screws which held the parts together. The Chairman, having submitted his hand for experiment, an exposure of five minutes was given with most successful results, not only the shape, but the structure, of the bones being shown. A negative was also taken of a frog with three minutes' exposure. The results were excellent as regards the skeleton, but it was evidently over-exposed. One minute's exposure would have been quite sufficient. Several other plates were exposed beneath different objects, the results in every case being perfect. During the demonstration Mr. Greenhill replied to a number of questions which were asked him by those present. Speaking of the relative penetrability of different substances to the X rays, he said that hard vulcanite was most easily pierced. Among metals aluminium offered the least resistance, and lead about the most. Gold and silver were fairly easily penetrable. In his concluding remarks to those desirous of investigating these phenomena, Mr. Greenhill urged the necessity of proceeding on exact scientific lines. Desultory experiments were useless, and led to false conclusions. The Chairman, in proposing a vote

of thanks to Mr. Greenhill, voiced the opinion of all present in expressing the pleasure it had been to hear so clear an exposition, and to see such successful results. Personally he was inclined to think that these X rays would be found of more use medically than he had at first thought. If it could be found possible to show the structure and conditions of the organs in the thicker parts of the human body, the benefit would be great.

Woolwich Photographic Society.—March 12, Mr. E. Gibbs Kimber presiding.—Mr. J. MILLER, of the South London Society, gave a demonstration on

THE PREPARATION OF MIRRORS FOR PHOTOGRAPHIC PURPOSES.

He commenced by impressing upon his hearers the necessity of cleaning the glass before placing in the silver solution for coating. This he overcame by cleaning it first with nitric acid, and then with caustic potash, after which he placed it in a dish containing distilled water, his object being to keep it quite moist until the final operation. Mr. Miller had mixed up separately silver nitrate, 20 grains, to each ounce of water, and caustic potash, 20 grains per ounce, and a sugar solution made up as follows:—Loaf sugar, 1700 grains; distilled water, 20 ounces; pure nitric acid, 2 drachms; boil for ten minutes in a Florence flask or enamelled cup; when cold, add pure alcohol, 10 ounces, and distilled water to 80 ounces. From these the silvering solution is made as follows:—Two ounces of silver nitrate solution are taken, and to it strong ammonia ·880 is added drop by drop, until the precipitate first formed disappears (vigorously stirring with a glass rod all the time), and the solution is perfectly clear; to this is added 2 ounces of the caustic potash solution, then more drops of ammonia until again clear, and finally a few drops of the nitrate solution until a slight discolouration is noticeable; 3 ounces of this is then taken, and 3 ounces of water added, and 6 drachms of the sugar solution, 1 drachm to each ounce; when this is mixed, the glass to be silvered is taken out of the water and placed in another glass dish face downwards, and the solution poured on. In about twenty minutes or half an hour the solution will have become muddy; this denotes it has done its work, and, upon removing the glass, it will be found to be beautifully silvered on both sides, as well as the inside of the glass dish in which it was done; the glass can then be dried, and polished with leather and rouge, a splendid mirror being the result. Mr. Miller then showed a kind of frame made at an angle of 45°, in one side of which the mirror could be placed, and in the other a lens, the arrangement being used for taking reversed negatives, so much required in process work. The glass required for this must be optically ground, the piece used costing about 5*l*., although not so large as a half-plate. But the lecturer had succeeded in making some half-dozen or so mirrors out of ordinary plate, one of which far surpassed the optically ground piece, but to obtain these he had been obliged to coat some dozens of pieces.

Birmingham Photographic Society.—March 10, Mr. Cossins in the chair.—Mr. HAROLD BAKER gave a demonstration on

BROMIDE PRINTING AND DEVELOPMENT.

Mr. BAKER, in speaking of development, said that the modern developing agents, such as metol, amidol, and quinol, were superior to ferrous oxalate on account of the absence of iron, which, it was well known, could not be removed from paper, even if boiled in strong hydrochloric acid. Exposures were made from negatives of varying densities on Ilford slow and rapid papers, and developed with metol and "Harold Baker's developer."

Liverpool Amateur Photographic Association.—March 12, Dr. J. W. Ellis (Vice-President) in the chair. Mr. ST. C. CRAWLEY gave a short paper and a practical demonstration on

PHOTO-MICROGRAPHY.

The necessary apparatus which is required, in addition to the microscope, is of a simple nature, and was fully described. Mr. Crawley then proceeded to enlarge a microscopic section of ash wood to about 275 diameters, using an isochromatic plate, which was afterwards developed and handed round for inspection.

Oxford Camera Club.—March 9.—A demonstration of

PHOTOGRAPHY BY MAGNESIUM LIGHT

was given by Mr. E. A. RYMAN-HALL, one of the Vice-Presidents of the Club. To add interest to the proceedings, members were invited to bring cameras, an invitation of which several availed themselves. The Chairman of the evening (Colonel Impey) allowed himself to be posed before the cameras, three exposures being made. Two flash lamps were used in each trial, but, in the first exposure, one rather hung fire. The lecturer advocated as large a flame as possible, to give a more even lighting than possible with a small flame. After the exposure some of the plates were developed with satisfactory results.

Rotherham Photographic Society.—Annual Exhibition, March 10, 11, and 12.—This annual event (the seventh) was held in the St. George's Hall, Rotherham. Some 600 prints were displayed on the walls, and of this number about 500 were the work of members. Contrasted with the previous year, the quality showed only slight improvement; in fact, a more judicious weeding out would not have taken from the effectiveness of the Exhibition. It was noticeable that carbon and platinotype did not seem to be much favoured, the principal run of process being the gelatino-chloride. In quite a number of instances really good examples would have been still better by the adoption of a more suitable printing method. Landscapes very largely predominated, and there were a goodly number of bromide paper enlargements. Turning to individual effort, prominence has to be given to the examples sent in by Mr. R. Chrimes, jun., Miss M. Crossley, Mr. G. T. M. Rackstraw, Dr. Baldwin, Mr. W. H. Haywood, Mr. R. H. Law, and Mr. H. Smith. Mr. James Leadbeater had followed somewhat upon the lines of former years, when he produced the interesting series of photographs of frost on window panes. His latest efforts have been the rendering of crystals of various salts, the results being most marked. A big contribution of photo-survey prints also found a place. There was a fairly large loan collection, including specimens from the Autotype Company, London; Mr. C. B. Keene, F.R.P.S., Derby; Mr. W. G. Fox, a member (pen-and-ink sketches); Messrs. West & Sons, Southsea; and Messrs. Marion & Co., London. The opening ceremony was performed by Major Stoddart, J.P., the Chairman being Alderman J. Mason. The visitors included the Mayor and Mayoress of Rotherham (Mr. and Mrs. E. Hickmott), Lady Albreda Bourke, the Hon. Mabel Fitzwilliam, and the Hon. Theresa Fitzwilliam. The last three ladies were exhibitors. On each evening there were special attractions. Music was furnished by the Eastwood Orchestral Band and a party of glee singers. On Tuesday *Amateur Photographer* prize slides and Messrs. Wilson's *Ruined Temples of the Nile* slides were shown. On Wednesday the slides were scientific, including Röntgen, astronomical, frost, and salt-crystal photographs. Thursday night's slides were those of members. Mr. Leadbeater manipulated the lantern, and the Hon. Secretary gave the descriptions. There were crowded attendances on all the days, and it is expected the financial results will stimulate the Society to still greater things.

Kilmarnock and Ayrshire Photographic Society.—March 13.—Mr. J. Mack Wilson presided. Mr. T. H. STRINGER, the representative of the Platinotype Company, London, gave a demonstration on

PLATINOTYPE PAPER.

The absolute permanency of the paper and the facility with which it can be handled render it an exceedingly suitable paper for photographers. Among other things, he showed an ordinary print on the Platinotype Company's A.A. paper. This was mounted on a cut-out mount while slightly damp, so that, when quite dry, it was quite tight. The mount, with the print, was then placed in a frame and, instead of the ordinary backing, a sheet of ground glass was inserted. This, when held up to the light, had all the effects of an excellent transparency, and yet, when placed against a wall, had the appearance of an ordinary photograph. The one which Mr. Stringer showed to the audience was most pleasing. About sixty views, taken from negatives on Thomas's well-known anti-halation plates, were shown, and they certainly justify the use of anti-halation plates for interiors, not a trace of halation being seen, which is always more or less in views of interiors taken on ordinary plates. The views of the Albert Memorial Chapel and the Royal Mansoleum had been obtained by the special permission of Her Majesty the Queen, and they are believed to be the only ones extant. Mr. A. J. Thompson, Ayr Academy, and the Secretary, Mr. William Patterson, Newton Academy, Ayr, showed over two dozen slides from snap-shots taken at the Ayrshire teachers' picnic last summer. Mr. Maloni showed slides from negatives taken by his patent light at dances in the Town Hall, Ayr. This invention of Mr. Maloni's is admirably adapted for the purpose intended, viz., the photographing of people at their own houses in the evening.

Ulster Amateur Photographic Society.—March 9, Mr. Wm. Gray, M.R.I.A., in the chair.—M. ALEX. TATE, C.E., occupied the first portion of the evening with an extremely interesting account of the

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

He said, in his opening remarks, that the Convention was founded in the year 1886, mainly through the influence, and at the instigation of, the late Mr. J. Traill Taylor. It had been long felt that something more was needed than was supplied by the Royal Photographic Society and the various other photographic societies scattered all over the kingdom, in order to bring all orders and classes of photographers—professional, manufacturing, and amateur—into communication with each other for the advancement of photography in all its branches, the promotion of a friendly interchange of ideas, and the forming of a personal acquaintanceship among the workers in this science. The idea soon took shape, and the Convention was the result. It is governed by a President and Council of forty members, elected at the annual meetings held in various centres. Meetings have been held in Derby, Glasgow, Birmingham, London, Chester, Bath, Edinburgh, Plymouth, Dublin, and Shrewsbury, each one generally lasting a week, during which time prearranged excursions are made during the daytime to neighbouring places of photographic interest, while in the evening meetings are held for the reading of papers, with discussions thereon, and lantern displays. As illustrative of the kind of results obtained through the Convention excursions, he showed on the screen about 150 slides, many of them his own taking, and others supplied through the courtesy of Mr. R. P. Drage, the able Hon. Secretary of the Convention, the work of Mrs. Snowden Ward, Messrs. W. D. Welford, Teape, Hepworth, and Seaman, all well-known experts in such matters. In his concluding remarks, Mr. Tate hoped that the date was not far distant when the Convention would be invited to make Belfast a centre for one of its annual meetings, and he had great pleasure in bringing the suggestion before our local photographers for their consideration.

Patent News.

THE following application for a Patent was made between March 4 and March 11, 1896:—

KINETOSCOPIC PHOTOGRAPHY.—No. 4686. "Improvements in Apparatus for projecting Kinetoscope Pictures on the Screen." R. W. PAUL.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE NEW PHOTOGRAPHY.

To the Editors.

Gentlemen,—Great improvements have been made during the past few weeks in the Röntgen photography, and the process has now been sufficiently developed to render it of practical value in surgery and medicine.

Its successful application, however, requires expensive apparatus and special appliances, the working of which necessitates some technical knowledge.

Under these circumstances, acting on the advice of several eminent physicians and surgeons, I have decided to establish at this address a laboratory specially devoted to the purpose.

This will be equipped with the most improved apparatus, which will be added to as experience and experiment show to be advisable.

The work will be carried out under my supervision by one of my assistants, Mr. H. L. Tyson Wolff.

It is hoped that these arrangements will prove of service to medical men who may desire to have the process applied to their patients.

The laboratory will, it is expected, be in working order in the course of a few days.—I am, yours, &c., A. A. C. Swinton.

66, *Victoria-street, S.W. March* 11, 1896.

RÖNTGEN RAYS: PLATES AND GAS CYLINDERS.

To the Editors.

Gentlemen,—Although displaying much ignorance, I risk the following questions. If shadowgraphs can be obtained by sunlight, magnesium, the light from a paraffin lamp, and *without any light at all* (in the ordinary acceptance of the term), what would be a safe and Röntgen-rays proof method of packing or storing our dry plates? Are these rays in any measure answerable for unexposed plates being found to be fogged? Another question occurring to me is this, Would not the Röntgen rays prove a practical means of testing compressed gas cylinders, to show whether or no the steel is uniform in substance, and if it contains any flaws or undesirable inequalities? Any information will be welcomed and appreciated at least by—yours, &c.,

Kilburn, London, N.W. Frederick W. Muncey.

THE ARTIGUE PROCESS.

To the Editors.

Gentlemen,—I gather from the remarks under "By the Way" in your last issue but one, that the writer is not altogether enraptured with the general results he has seen by the Artigue method championed by Mr. Maskell. Personally, I do not propose criticising these, as clearly we both agree that, if Mr. Maskell obtains the results he seeks by this method, and is satisfied, no one has cause to complain; my object, however, in writing is mainly to correct an error stated under the above heading, viz., that Pouncy's process was solely used for large work and enlargements. As a fact, it was used almost exclusively for portraits or views ranging from 5×4 to 12×10, and when I look at a large frame of specimens of my father's early work, done about thirty-eight years ago, I see how favourably they compare with prints that could be made to-day from the same negatives by a process which is considered to give very fine results, platinotype, though I think the dense blacks are rather blacker; and yet, at that day, how few appreciated the work, because they would test everything by the microscopical fineness of a highly glazed albumen print.

Those who are acquainted with, or can refer to, my father's published formula for coating the paper, can see how practically identical it is with those instructions given to "W. Benington" by Mr. Maskell in your pages. I naturally ask, Who is the author?—I am, yours &c.,

Dorchester, March 10, 1896. W. Pouncy.

To the Editors.

Gentlemen,—I find it hopeless to attempt to persuade "Dogberry" (or, what is perhaps the same thing, Mr. Chapman Jones) to be logical on the subject of the ignorance and false teaching of the text-books relating to carbon printing. The communication of "Dogberry" in your issue of the 6th inst. only the more fully persuades me that I was right in the accusations which I brought, and I cannot help thinking that he has never taken the trouble to examine a print successfully made by the newer process. Had he done so, he could never have written: "It is quite true that the effects sought after by the new school of "pinholists" and "fuzzytypers" may be arrived at by means that would scarcely satisfy the cravings of the majority of photographers, and which would scarcely be expected to do justice to the capabilities of our modern lenses." I have maintained, and maintain, that the new method (and it is distinctly a new method, and not that of Pouncy) can, and will do, justice to these capabilities. As "Dogberry," or Mr. Jones, will not be logical, may I ask them to be practical, and to accept the challenge which I now make; that is, that he, or they, and I, select each one negative, from which they shall make prints by the autotype or any other process? I, on my part, will undertake to produce prints of the same negatives on Artigue paper, which shall be in no way inferior, and shall equal theirs for definition and for "doing justice to the capabilities of our modern lenses." The prints to be exhibited at the next Exhibition of the Royal Photographic Society with the dicta of the text-books, and the upholding thereof by Mr. Chapman Jones written beneath, and also my denunciation of the same. Then, those who run may read, and form their own conclusions.—I am, yours &c., Alfred Maskell.

St. James's-street, S.W.

PHOTOGRAPHING IN THE NATIONAL GALLERY.

To the Editors.

Gentlemen,—The enclosed correspondence may prove interesting enough for publication in your paper.—I am, yours, &c., R. W. Craigie.

Camera Club, Charing Cross-road, March 14, 1896.

[Copy.]

"*Camera Club, Charing Cross-road,*
"*March* 4, 1895.

"The Secretary to the Trustees of the National Gallery.

"Dear Sir,—Some two or three years ago I ventured to write to you for permission to photograph in the National Gallery. In reply, you informed me that it was against the rules of the trustees to admit cameras to the gallery, and, in an interview which you were good enough to accord me subsequently, you gave me to understand that exceptions had only been made in favour of a firm of foreign photographers.

"I would like to ask whether the time has not now arrived for the trustees to rescind this rule, which seems, if you will allow me to say so, both unreasonable and arbitrary. On certain days art students are allowed to set up their easels and reproduce the pictures on canvas, &c., and I fail to see why an equal privilege should not be extended to photographers. There are not two opinions as to the rapid strides which photography as an art has made during the last few years, and in no branch of it is there more scope for skilful treatment than in the correct colour-rendering and reproduction of pictures. It was urged as an objection, if I remember rightly, that cameras in the galleries would prove unsightly. Surely, however, by confining the privilege to a certain day or days, and to a limited number of cameras at a time, this objection could be easily met, and, apart from the invaluable assistance that the student in photography would derive from such opportunities, the advantage of being able to procure reproductions of pictures done by some of our most skilled English photographers, such as Mr. F. Hollyer, Mr. A. Burchett, &c., would, I think, be almost universally appreciated. After all, the pictures are the property of the nation, and I cannot believe that, after further consideration, the trustees will any longer be willing to withhold a privilege which would be welcomed by photographers generally, and which would result in a direct benefit to the British public.

"I am, dear sir, yours faithfully,
"R. W. Craigie."

"*National Gallery, March* 5, 1896.

"Sir,—In reference to your letter of yesterday, you are mistaken in supposing that your previous application (made in December, 1891) for permission to photograph pictures in this Collection was refused on the grounds which you mention. The reason assigned was that permission was never given to amateur photographers, and that no exception would be made in your case.

"You are also mistaken in suggesting that permission to photograph here was ever limited to foreign firms.

"The privilege has been accorded to numerous professional photographers, both in London and the provinces.

"It is quite true that the presence of so many cameras in this Gallery has become a source of inconvenience to students of painting and visitors on Thursdays and Fridays. But, if, in addition, amateur photographers were also allowed to practise here, work of any kind, whether in painting or photography itself, would soon become impossible.—Faithfully yours,

"R. W. Craigie, Esq. Charles L. Eastlake."

[Copy.]

"*Camera Club, March* 13, 1896.

"Dear Sir,—With reference to your letter of the 5th inst., I am glad to find that I have been wrong in supposing that permission to photograph in the National Gallery was ever limited to foreign photographers, though such an impression seems to have been very general. But why, may I ask, should the privilege be confined to professionals? If there is one branch of photography where amateurs can excel, it is, I think, in the reproduction of pictures, in-

volving, as it does, an immense amount of time and attention, such as the professional is rarely able or willing to afford.

"With regard to the inconvenience to students and visitors, I would merely repeat that, by placing reasonable restrictions upon the number of cameras admitted at a time, risk of this would be either altogether avoided or reduced to a minimum. As a matter of fact, I visited the Galleries yesterday—a students' day—about twelve o'clock, and found but few visitors and not a single photographer. Moreover, the fact of having to procure skilled assistance from outside (where permission is obtained) for unglazing a picture, would, I should say, sufficiently deter all but those amateurs who have a serious purpose in view from availing themselves of the privilege.

"You evidently find yourself unable to hold out any hope that this grievance may be redressed, and, as I have reason to believe that the matter is one of very general interest, I take the liberty of sending this correspondence to the press. "I am, yours faithfully,

"C. L. Eastlake, Esq. R. W. CRAIGIE."

PHOTO-CHROMOSCOPES.

To the EDITORS.

GENTLEMEN,—Mr. Edwards in his former letter (p. 125) made a number of statements which I refrained from commenting upon because I thought that a perfectly just reply would require the use of language that might prove as offensive to him as some of his own remarks did to me. My reply was carefully considered, and intended to be perfectly fair and courteous. I stated only such facts as I found references to prove (references which, I believe, are accessible to Mr. Edwards), confined myself to the main points at issue, and, unlike Mr. Edwards, refrained from personalities. Nevertheless, although Mr. Edwards has not disproved, and cannot disprove, a single statement that I made, he now complains (p. 174) of the "tone" of my letter, and accuses me of "piling up statements on assertions," of "making a wide extension of claims," of a "misstatement of facts," of "misleading statements and random assertions which he [I] cannot prove," &c.

It is evident that Mr. Edwards can in half a dozen words make a misstatement, actual or implied, which I may have to quote whole paragraphs from my patents or other publications to disprove; and, in fact, he has done this so many times already that, in view of the nature of his last communication, I am compelled to ask for space in which to discuss his statements at some length.

"In the first place," Mr. Edwards wants to know how I can reconcile the tone of my last letter with the admission that I did not doubt (his solemn statement) that he conceived the idea of a step photo-chromoscope independently. *Answer:* There is nothing to reconcile. I have said nothing that was inconsistent with a belief in that statement. I have never charged Mr. Edwards with *copying* this or anything else from my patent or other publications. I merely stated that his construction was *in accordance with* my specification, and gave dates of patent application and issue and other publications to prove priority. Mr. Edwards appears to have invented the "copying" fiction for the purpose of creating sympathy for himself at my expense. The fact is that, although my U.S. patent had been published months before Mr. Edwards's first date of record, I accepted his statement that he had a conception of a step photo-chromoscope before he knew of my work; but he did not tell me, and I did not suppose—far less say that I believed—that he had such idea before I applied for a patent on a complete and perfected apparatus, or that he had developed the idea until after my U.S. patent was published. The first date which Mr. Edwards has given, and which rests only upon his own assertion, and evidently refers to the time when he was working upon a three-step instrument (which he showed me when I visited him at his request), is antedated by my application for a patent on a perfected two-step apparatus, with folding chromogram, and everything as now exhibited by me. In that patent, and in my British patent of same date, I claimed important features of the apparatus as since constructed by Mr. Edwards, and other important features which are described in his patent specifications. He cannot therefore manufacture and sell the instrument he has shown without infringing rights which are my own by priority of invention, priority of patent, priority of publication, and priority of public exhibition.

In view of the fact which I have pointed out, and which Mr. Edwards knows perfectly well, that my U.S. patent was *published* months before his first date of record, what does he mean by giving the recent date of publication of my British patent (for the same invention) *as a reason why he could not have copied from me?*

Mr. Edwards makes a grave accusation of "misstatement of facts" with reference to the subject of features claimed in my patent as filed in July 1894, but not shown in his records until December last. The facts are as I have already stated. Mr. Edwards's provisional specification did *not* disclose ideas which I claimed in my patent specifications as new inventions, and for which I claimed, and was granted, protection, and which are shown in Mr. Edwards's drawings, filed for the first time with his complete specification. I shall give references to prove the facts conclusively.

Claim No. 2 of my U.S. specification (published in December 1894, No. 531,040) reads as follows:—

"A photo chromoscope, or photo-chromoscope camera, comprising a casing having a series of seats one above another, for a sectional chromogram, a series of inclined mirrors, some or all of which are transparent, said mirrors being located one behind another in the line of sight, *and inclined in a horizontal plane.*"

Claim No. 3 reads as follows:—

"A photo-chromoscope, comprising a casing having a series of inclined mirrors, some of which are transparent, a series of colour screens, a series of chromogram supports, one above another, *and means for varying the angle of said instrument in respect to the direction of the light rays, substantially as specified.*"

I have italicised the claims to details of the invention, the object and value of which was disclosed in the body of the specification, as follows:—

"The arrangement of images in steps, and the reflection of the light passing through these images by means of transparent mirrors, is not new; but, in the only prior device of this kind with which I am familiar, *the steps were perpendicular to the base of the instrument*, and the transparent mirrors were glasses with parallel surfaces, which doubled the outlines of the respective images. This, taken in connexion with the inconvenience of the instrument, rendered the same so defective as to make it practically useless. . . . In all the various forms of my instrument, however, what may be termed the base edge of the chromogram or of each section of the chromogram is horizontal, and the images are situated one above another, *whereby I am enabled to bring the angles of illumination and vision into the most desirable relation to each other, and to the most convenient source of light, namely, a light sky seen through a window.*"

The significance of these improvements, which I described and showed in my drawings and claimed, and which were recognised as patentable inventions in both the U.S. and the British Patent Offices, may be realised by considering what would be the difficulty of securing proper illumination with my instrument if turned on its side at a suitable angle for convenient vision, and the awkwardness of inserting and registering the folding (or any other) chromogram in that position. The drawing in the British patent of A. H. Cros, No. 9012, May 30, 1889, shows the clumsy appearance and awkward disposition of step instruments as previously conceived.

Now Mr. Edwards's provisional specification does not disclose these improvements, which are first shown by him in his drawings filed in December last, long after drawings of my instrument were published in British photographic journals. Mr. Edwards may or may not have originally conceived the idea of an instrument with horizontal steps and hinged attachment to a baseboard or tray, with means for fixing the angle of inclination; but that construction was patented by me nearly a year and a half before his records show it.

Mr. Edwards does not dispute the fact that I was the first to disclose the idea of using thinly silvered or platinised transparent mirrors in a photo-chromoscope camera (U.S. patent, No. 475,084, May 17, 1892, page 3). Admitting this, he did not need to say more. His reference to "wedge-shaped glass reflectors, chosen at random from a crate of glass," is uncalled for, for more reasons than one, but chiefly because, although I stated that wedge-shaped glass reflectors might be used (an eminent authority, viz., Captain Abney, has praised the ingenuity of the idea), I also described a method *not* requiring wedge-shaped glasses, and, in fact, have not used them in two cameras made last year. Mr. Edwards quotes my statement of the difficulty of obtaining platinised mirrors with plane surfaces as if to my discredit, but he admitted experiencing the same difficulty in his first letter. This difficulty has been overcome, but it was not Mr. Edwards who solved the problem. Transparent silvered mirrors can also be made more perfectly now than when I first took out my first patent; but this, also, by a method which did not originate with Mr. Edwards. In short, the plan of using transparent silvered mirrors in a photo-chromoscope camera was first published in my patents long before Mr. Edwards says he conceived the idea, and such mirrors, quite suitable for the purpose, can now be made by methods which did not originate with Mr. Edwards. In view of these facts, I venture to suggest that the tone of Mr. Edwards's remarks upon this subject is decidedly objectionable.

Mr. Edwards no longer disputes, although he has not expressly acknowledged, my priority in the production of colour records by the simultaneous exposure of three separate and different plates. His claim to this idea may be found in the last paragraph of page 1 of his provisional specification, dated February, 1895; and my publication of the same idea may be found in a lecture published in the *Journal of the Franklin Institute*, Philadelphia, January, 1891, page 15. He also no longer disputes my priority in the idea of composite colour prints, two images of which are on glass, and the third on a thin film between. His claim to this idea may be found in the last paragraph on page 3 of his provisional specification, and my publication of the same idea may be found in my book, *A New Principle in Heliochromy*, published in 1889.

Mr. Edwards challenges me to oppose the sealing of his patent, and intimates that that would be more dignified than prolonging discussion in your JOURNAL. I would remind Mr. Edwards that he is himself entirely responsible for the discussion between us, having commenced it by making false claims to property rights in my inventions, and followed it up by false accusations, misrepresentations, and unkind remarks,

which I was bound to disprove and resent. One can readily understand his reason for wishing the correspondence to terminate with his own letter!

But why is Mr. Edwards so bold in challenging me to oppose the sealing of his patent? and why does he prefer that course for me to discussion in your JOURNAL? I think I can explain the reason very clearly. If anybody copies one of my patent specifications in substance, and my patent drawings in every essential detail, but with the *addition* of some trifling details or modifications (which he may allege to be improvements), and then, if he strictly limits his claims to the inclusion of these details, the Comptroller of Patents, having very limited powers under the Patent Act, might not be able to refuse the patent, whatever opinion he might have formed as to the value of the alleged improvements, and although it would be recognised in law as only an (alleged) "improvement patent," subject to my original claims upon the essential features, and possibly of no legitimate value. Mr. Edwards may have had in mind this possibility of obtaining a patent on technical grounds when he so triumphantly asserted that I would find none of his claims "identical" with my own.

Three more points, briefly: Mr. Edwards proposes, instead of fixing his colour screens for viewing purposes upon the instrument itself, to fix them upon the chromogram sections, so that a complete set of colour screens will be required for every complete colour record, instead of one set for any number of colour records. At first glance this idea might appear stupid (no one would for a moment think of calling it an improvement); but, after what has passed between us, would I not be justified in entertaining a suspicion that it had been done in view of my patent rights with the deliberate intention of getting around my claims by appearing to leave out of his construction one of the elements which he supposed was claimed as an essential part of my invention, and then to make a virtue of what he conceived to be a necessity for him, and pretend that he thought this plan was an improvement? It should be known, then, that before my patent was issued, in 1894, I called my patent attorney's attention to the possibility of somebody attempting to evade my claims by such a trick, and he told me that such construction would at least amount to "contributory infringement," since the instrument would not be operative until the colour screens were brought into position and performed their function as indicated in my patent; but, as a further safeguard against "misunderstandings," *we made one of the claims complete without reference to the colour screens.* Perhaps Mr. Edwards has overlooked this fact. I will also inform him that I have French and Austrian patents, dated some months before his first date of record, in which I expressly stated that, although it was *best* to have the colour screens fixed to the photo-chromoscope, they *could* be fixed to the chromograms! Second, Mr. Edwards also shows a plan for using the instrument for projection purposes with three sources of light. It can be shown that this device with *three* sources of light cannot be made to give a larger or brighter image on the screen than my own special triple lantern attachment will with *one* source of light! Third, the above are, I think, fair illustrations of the true inwardness of Mr. Edwards's alleged improvements. For the purposes for which he commends his alterations in detail and application, they appear to me to be positively retrograde movements. Nevertheless, in so far as they appear to show "new matter," they may possibly give him a technical right to the nominal acquirement of a useless patent.

Mr. Edwards has made it necessary for me to go somewhat into details in this letter, although I think it should be sufficient for the public to know that the invention was patented by me before Mr. Edwards's date of record, that my British patent dates with my original application, that Mr. Edwards has no standing, except possibly technically, as to modifications and details, which are not improvements, and which he has nothing of his own to apply them to; that, despite all this, he appears to threaten to manufacture and sell the apparatus, and to involve me in legal expenses to protect what I have earned by honest labour, and protected by performing every legal obligation; and that he is paving the way for such an act by making false accusations, and indulging in personalities calculated to prejudice the public against me and my inventions.—I am, yours, &c.,

F. E. IVES.

MR. W. H. HARRISON.

To the EDITORS.

SIR,—I should like to be allowed to add my word to the appeal already made by Mr. Pringle and Mr. Varley on behalf of our friend, Mr. W. H. Harrison, so as, perhaps, to bring the matter under the attention of some of his friends or acquaintances who may not yet have heard of his affliction and circumstances.

Mr. Harrison was always ready with personal assistance, and with useful suggestions and advice by which many photographers have benefited without knowing the source of the service.

In my own organizing work at the Camera Club this was the case, and I am very anxious to add my tribute of respect and esteem for his thoughtful consideration, his services to photography, directly and in his outside journalistic work, and his modest way of giving a helping hand.

I sincerely hope that a sufficient number of friends will rally round to give him some substantial assistance.

Mr. F. H. Varley is kindly undertaking the management of the appeal, and contributions should be sent to him at 82, Newington Green-road, N.—I am, yours, &c.,

GEORGE DAVISON.

Camera Club, March 14, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

J. L. Hopper, 4, Pendle-street, Nelson, Lancashire.—*Photograph of railway accident at Nelson on February* 18, 1896.

Mr. Philip Newman, 91, King's-road, Brighton.—*Photograph of an amended reproduction of original equestrian photograph of H.R H. the Prince of Wales.*

Mr. J. Kennerell, 7, York-row, Wisbech.—*Photograph of an illuminated address to the Hon. Arthur G. Brand; photograph of solid silver presentation plate to the Hon. Arthur G. Brand.*

Mr. Wm. Wilkinson, High Causeway, Whittlesea.—*Photograph of sketch in "Illustrated London News" of July* 10, 1847, *of the entry of General Sir Henry Smith into Whittlesea after the Battle of Alwal.*

RECEIVED:—R. W. PAUL, BIRMINGHAM PHOTOGRAPHIC COMPANY, ALFRED WATKINS, and others. In our next.

THE NEW PHOTOGRAPHY.—COLONEL. Thanks for the cutting. Similar experiments have already been noticed.

BLISTERS.—CARBOLIC. We have no recollection of having given such a preventive. Kindly let us know the page, we can then supply the information desired, no doubt.

BLEACHING.—BOTHERED. The bleached image will not alter if it is kept in the dark. If the latter cannot be done, why not bleach with bichloride of mercury, which is not alterable by light?

CARBON TISSUE, &c.—CAPE COLONY. The Autotype Company, 74, New Oxford-street, and Elliott & Son, Barnet, supply materials for carbon printing. We are not aware of the existence of any "monopoly."

GELATINO-CHLORIDE — COLLODIO-CHLORIDE. — INVESTIGATOR. 1. If the firm has not replied to your complaint, we certainly can do nothing in the matter. The paper has a good reputation for keeping. If it is yellow, there is no remedy. 2. Collodio-chloride prints are seldom enamelled; when they are, they are done in the same way as albumenised-paper prints are—with collodion and gelatine.

MEALY PRINTS.—B. LIVERMORE complains of mealy prints, and, in his letter, incidentally mentions that the toning bath was the "usual acetate bath," used within a few minutes of mixing. Here, at once, is the source of the trouble. The acetate toning bath should be made up at least twenty-four hours before it is used. Some workers never employ this toning bath until it has stood two or three days after it is mixed.

WOODBURY LANTERN SLIDES.—SLIDE asks "what presses are necessary in printing lantern slides, as he would like to try his hand at the process?" —No press is required for the printing. The cleaned glass is simply pressed on the metal mould, after the ink is poured on, for a few seconds, and then left till the ink has set firmly. The only press required is an hydraulic press for making the metal moulds from the gelatine reliefs.

SULPHUR TONING, DISSOLVING GOLD.—J. H. J. asks: "Will you kindly give us (1) the formulæ of sulphur toning as recommended by Dr. Thresh in his lecture before the Leeds Camera Club? (2) By what means can we dissolve the gold that adheres to the sides of the stock gold solution bottles?"—1. We do not know; the formula was not given in the report supplied to us. 2. One part of nitric acid to four or five parts of hydrochloric acid will dissolve the gold off as a chloride.

MOUNTANT.—T. C. SHORTER. Flour paste is scarcely to be recommended as a photographic mountant. Starch is better, but it should be freshly made. Nothing, however, beats gelatine for mounting silver prints.

CERAMICS.—TRYING says: "In the JOURNAL for February 28, you mention Messrs. Ethelbert Henry and H. Snowden Ward's book on ceramics. I would thank you very much if you would please give me the full address of Messrs. Dawbarn & Ward."—In reply: The address is Farringdon-avenue, E.C.

FAULTY LENS.—If the surface of the glass has become dull and iridescent, the instrument should be returned to the maker. Clearly an unstable glass has been used for one of the elements. It is impossible to say how long a lens should last. Some of the earliest lenses made are still as good as they ever were, so far as the glass is concerned.

COLOURING P. O. P. IN OILS.—E. W. P. There is no book published on colouring P. O. P. prints in oil or in water colours, but the treatment any other photographs receive will answer as well with the P. O. P. paper. If you are ignorant as to colouring photographs, we should advise you to get a few practical lessons in the work from a practised hand.

EMPLOYMENT IN CANADA.—F. PERCY says: "Can you give me any information concerning the prospects of photographers and photographic assistants, salaries, &c., in Canada? Also will you oblige by informing me where I can obtain a copy of the American professional paper?"—In reply: 1. From inquiries we learn that photographic assistants have no better prospects in Canada than here at home. 2. There are several photographic papers published in America; which one do you mean?

LENS COMPETITION.—COLONEL says: "In a paragraph in last week but one's JOURNAL I saw it stated that Messrs. Voigtlander & Son had recently offered three lenses of the value of 20*l.*, 15*l.*, and 10*l.* for the best pictures taken with lenses of their make, reserving the right to reproduce the successful pictures on terms to be arranged. If the notification appeared in the JOURNAL, I never saw it, and I presume it is now too late to compete?"—Yes, too late to compete. The competition closed on March 1.

ARTIFICIAL LIGHT.—W. E. K. says: "I would be very much obliged if you could give me any information as to any artificial light I could use for photographing at night. I have to 'take' a group of an amateur operatic society on the stage, with scenery, &c., and it is impossible to get the company together at any other time."—In reply: We should recommend our correspondent to employ, say, four flash lamps, each charged with about a drachm of magnesium. An exposure of three or four seconds at *f*-8 with a fairly rapid plate should suffice.

COPYRIGHT.—F. J. ROBINSON says: "Having recently photographed a popular minister in this locality entirely at my own expense, I should be obliged if you will kindly inform me how to protect myself by registering same, cost, and how long the copyright remains in force. Must each position be registered separately?"—In reply: Send our publishers two unmounted copies and one mounted copy (together with 1*s.* 7*d.*) of each photograph you want registered, and they will do what is required. Copyright lasts for seven years after your death. Better register each position.

SELLING AN INVENTION.—H. PRADEAN says: "I have lately invented and provisionally protected a hand camera. As I am unable to put it on the market, I should like to sell the invention. If you would kindly give me information how to proceed and where to apply, I should feel greatly obliged. As I have never put such things on the market, I am afraid I should find it rather difficult."—In reply: Your best plan will be either to advertise the invention for sale, or submit to some of the apparatus-manufacturing houses whose announcements will be found in our outer columns.

LANTERN-SLIDE DEVELOPER.—A. F. P. writes as follows: "I have lately been making some lantern slides by the wet-plate process, using the following developer:—Pyro, 12 grains; acetic acid, 1 ounce; water, 12 ounces. 35-grain silver bath, acidified with acetic acid. The results were good, the tone partaking of a deep-claret colour. In reading the article on *Wet Plates*, in the current Annual, I find the iron developer alone given. Is this considered superior to pyro? and, if so, will you kindly say why, as I have never been able to get such good results with it for transparency work, either as to colour or fineness of grain, as with pyro?"—Our correspondent is quite right, that the colour with pyro developer is warmer, and the grain finer, than is the case with iron; but greater skill is required with the former developer to get the best results than with the latter. It is for this reason that the iron developer is almost universally used for lantern slides.

DEVELOPING.—A. C. ANSED says: "I get my living by taking views round about the country, and up to the present have been buying my developer ready-made. A friend of mine, however, obliged me with the prescription, and to save expense I thought I would make my own developer. Can you oblige by telling me, through your paper, what is wrong? The developer does not answer at all, and will not bring the picture out. Would caustic soda answer instead of carbonate of soda? I don't want to waste the developer on hand if I can help it?"—The developer you have made up ought to work all right, possibly you have not allowed time enough. You can substitute caustic soda for the carbonate, but only use the same weight of that as of the hydroquinone. Possibly hydroquinone is not well suited to the plates you are using. Why not use the developer recommended by the makers of the plates? Dozens of formulæ for developers are given in the ALMANAC.

STUDIO.—SIDE LIGHT says: "I should be very glad of your opinion. I am building a studio, where there is plenty of room for one, 30×15, with north light, but I shall be overshadowed by a tall building about thirty feet away. Under these conditions I am undecided as to two points—measurement of side light from floor to eaves, and how low to glaze side light. A reply to these two points will greatly oblige."—If the buildings are as shown in the sketch, the high building will not practically interfere with the light. About eight feet from floor to eaves will do. The glass need not be nearer the floor than two feet six inches.

RÖNTGEN PHOTOGRAPHY.—MR. E. SCAMELL writes: "I notice in your last issue, under the heading 'Ex Cathedrâ,' you think there is an opening for a professional to take up the new photography (Röntgen process). I have pleasure to inform you that I have now had the necessary apparatus (large induction coil, &c.) on order for some weeks, and am daily expecting the delivery of same. As soon as it comes to hand, I hope to be able to fill the want, at any rate, amongst local medical men, some of whom have already been to me, thinking perhaps I could do such work."—We are glad to have our correspondent's letter. See also the first page of this number of the JOURNAL.

THE COOKE LENS.—C. H. CHAVANT, of Greenville, Jersey City, N.J., says: "I read in your BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, on page 829, your article on the Cooke lens. I feel very interested in the description of this lens, and would like to know, if such a lens is for sale, by whom it is made, and where. I have looked over all the advertisements of the ALMANAC, but could not find anywhere the advertisement of the makers; therefore I take the liberty to write you directly, asking you to have the kindness to let me know the name and address of the manufacturers of the Cooke lens."—In reply: The makers of the Cooke lens are Messrs. Taylor, Taylor, & Hobson, Slate-street Works, Leicester.

STUDIO FOR PORTRAITURE.—A. S. (Frome) writes: "I want to build a studio, and should be very grateful if you can assist me with some few particulars. 1. What is a suitable size for ordinary portraiture—length, width, and height of sides? 2. What extent of glass is necessary? and, 3. Is it sufficient if only one of the sides is glazed, and one side of the roof, or is it best to have both sides glazed?"—1. About thirty feet by fifteen is a convenient size for portraiture. From floor to eaves about eight feet. 2. Five or six feet at each end; top and sides opaque; the rest of glass. If both sides are glazed, ten feet at the camera end may be opaque. 3. This much depends upon the aspect of the studio.

PHOTOGRAPHING A CEREMONY.—R. & Co. write as follows: "A foundation-stone is to be laid in this town next week by the Mayor. We have applied for permission to photograph the ceremony, and have been refused, the reason being that another photographer has arranged to do the work. We shall, however, be able to get a very good photograph from outside the enclosure. What we wish to know is this, supposing the appointed photographer succeeds in registering the copyright in his picture before we do ours, can he prevent us from publishing ours, and, if we are first, can we prevent him from publishing his?"—Certainly not; neither can prevent the other from publishing his work, no matter which is registered first.

RÖNTGEN PHOTOGRAPHY.—W. H. H. says: "It has occurred to me very often since the advent of the new photography or X rays that, were it possible in surgical cases to produce the bones white instead of the shadowgraph form, it would, doubtless, be an immense advantage. With that end in view I have been experimenting a little. I enclose a print of one of my first efforts. Should like your opinion. Not having the necessary apparatus by me to make the shadowgraphs, I have had to confine myself to book illustrations, which make it more difficult to get good results from. All the work I have seen done by the X rays is of the shadowgraph form, hence my sending you this."—In reply: Medical men tell us there is no advantage in what you suggest.

TONING COLLODIO-CHLORIDE PAPER.—C. G. & Co. write: "We are using, as a printing paper, the collodio-chloride paper; and, as we find we get the best results with the combined toning and fixing bath, we would ask you whether we might consider the prints to be as permanent as those toned and fixed in the separate bath. We have heard different opinions of this, and shall be glad if you could kindly oblige us in this matter."—We do not recommend the combined toning and fixing bath any more for this paper than we do for any other. What has been said against the combined bath for gelatino-chloride paper applies equally as well to the collodio-chloride. Any desired tone may be obtained on collodio-chloride paper with separate toning and fixing, if the paper be good.

STUDIO LENS: PRINTS.—SUBSCRIBER (Swansea) writes: "Will you kindly answer the following:—1. What would be the best colour to paint inside studio which is matchboarded, and built on H. P. Robinson's plan? I am now troubled with double lights in the eyes; how can I prevent it? The side wall of the studio is yellow. 2. What is the use of the extra hood or tube supplied with a Dallmeyer triplet? 3. Can the freshness of a gelatino-chloride print when wet be retained when dry or mounted? My prints turn a yellowish colour. If they should be rewetted, they turn again to the fresh colour."—In reply: 1. Any neutral or unobtrusive tint will answer—say a dark French grey. The double light in the eyes is due to the faulty lighting of the sitter. 2. We do not know what you mean by *extra* hood. Possibly it was supplied for some special purpose of the purchaser. 3. The gloss can be retained by squeegeeing the prints on glass and mounting them while in contact with it. If the prints turn yellow when dry, there has been something wrong in the manipulation.

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EX CATHEDRÂ.

A fortnight ago we gave publicity to a letter from Mr. R. Bennett, of 19, Brunswick-street, Liverpool, in which that gentleman expressed a wish to acquire photographs of ancient wind and flour mills, for the purpose of illustrating a book on the subject. In reference to the matter, we have received from Mr. Frank M Sutcliffe, of Whitby, a letter in which he makes the following comments:—

"I doubt if you would have tried to help him (Mr. Bennett) if you had known that he only offers 2*s.* 6*d.* for right of reproduction. I have told him that we photographers are not allowed to charge *less* than 10*s.* 6*d.* according to the rules of our Copyright Association."

* * *

Two shillings and sixpence, even with the additional advantage of the insertion of the artist's name under the reproduction, which Mr. Bennett tenders, for the right of using a tolerably scarce or, indeed, any photograph, is certainly, in all conscience, a small enough fee to offer. We should image that Mr. Bennett was not aware of the existence of the Photographic Copyright Union, and of its strenuous efforts to persuade photographers not to continue in the fatal practice, once common with so many of them, of undervaluing the products of their time, labour, and money. But, indeed, whether this be so or not, we repeat that 2*s.* 6d. is a very small sum to offer, and one which we should imagine even the verlest amateur would not accept.

* * *

As we have previously announced, there will be delivered, under the auspices of the Affiliation of Photographic Societies, six experimentally illustrated lectures upon the subject of photography with the bichromate salts, at the rooms of the Royal Photographic Society, 12, Hanover-square, W., on Fridays, April 10, 17, 24, May 1 and 8, and on Tuesday, April 28. The following is the syllabus:—April 10, *Scientific and Historical Preliminary*, by Captain W. de W. Abney, C.B., D.C.L., F.R.S. '17, *Carbon Printing*, by Mr. J. A. Sinclair. 24, *Collotype*, by Mr. W. E. Debenham. 28, *Woodburytype*, by Mr. J. D. Geddes. May 1, *Photo-lithography and Photo-zincography*, by Mr. W. T. Wilkinson. 8, *Process Work Applications*, by Mr. W. T. Wilkinson. Admission is to members of affiliated societies by tickets, to be obtained beforehand from the Hon. Secretaries of their societies, 1*s.* the six letures; non-members, by tickets, obtainable only on application to Mr. R. Child Bayley, 12, Hanover-square, W., 3*s.* 6*d.* the six lectures.

* * *

Yet another professional photographer is taking advantage of the opportunities offered by the publication of Röntgen's experiments for increasing the scope of his business. Mr. E. Senlor, of 219, Camberwell New-road, writes: "Referring to your first paragraph of March 13, *re* the 'New Photography,' I beg to say I have been carefully studying the subject from the first, and am fitting up, at above address, the most approved apparatus for the production of Röntgen photographs, and I hope, in the course of a few days, to be in a position to undertake this new class of scientific photography. The appliances, which are of the latest description, will be further added to as fresh developments may seem desirable."

* * *

"Photo," under which *nom-de-guerre* a country photographer conceals his proper name, writes: "I beg to call your attention to the enclosed cutting from this week's *Answers*, thinking

that, if inserted in the JOURNAL, it would be interesting to see what the various opinions of correspondents would be respecting the absurd statement."

* * *

THE cutting from our interesting contemporary implies that some photographer (unknown) derives a considerable revenue from exhibiting the photographs of his sitters in his window. "'Would you be surprised to hear that many of my customers pay me to put their photographs in my window?' asked a photographer of the writer. 'It's a fact, I assure you; and, what is more, it is nearly always they who make the request, not I who make the offer. They generally ask me after a sitting what the cost of the photographs will be, and when I tell them they say, "How reasonable! And what would be your charge for putting one in a nice frame in your window?" What *do* I charge? Half-a-guinea for a *carte*, a guinea for a cabinet, and so on, for each month. Nearly all the photographs you see in the window—and there are some sixty or seventy—are paid for in that way; indeed, I make a clear 150*l.* a year by exhibiting photographs in the window. Then, there is another important aspect to the matter. Some of my customers, after they have sounded me as to whether I will exhibit their photographs or not, will sit again and again, and have dozens of likenesses of themselves in different positions before they are contented that they have one sufficiently complimentary to merit being exhibited. All this means money to me."

* * *

MANY of our professional readers who are continually on the look out for fresh ways of improving business will, doubtless, thank us for pointing out to them such a simple plan of increasing their turn over! A guinea for the exhibition of a cabinet photograph for one month must be very remunerative. We fear, however, that the whole paragraph is more remarkable for the evidences of a fanciful imagination it displays than for any relationship, however remote, to solid fact. Photographers, in our experience, rarely, if ever, earn money so easily; nor are sitters, however vain, so ready to throw their money away.

* * *

SOME months ago we published several letters relating to the plan of issuing cheap enlargements, adopted by *Pearson's Weekly*, in return for one or two coupons and a payment of five or six shillings. A correspondent, Mr. Wilson, of the Wilson Art Studio, Southsea, draws our attention to the circumstance that the plan is still favoured by our contemporary. He says: "They state that when they made this same offer some months since they received 7000 photographs to enlarge. Just imagine what 7000 enlargements (which ought to have been done by the legitimate photographer) would mean to our trade! May I through our esteemed trade medium, THE BRITISH JOURNAL OF PHOTOGRAPHY, appeal to every one of my fellow-photographers and all connected with the photographic trade in this country to show them (*Pearson's Weekly*) how unfair it is to enter into competition with their customers?"

* * *

WE are happy to afford our correspondent the opportunity of airing his grievance against *Pearson's Weekly*, although we expect, from the result of the former agitation on the same subject that appeared in our pages, that no direct practical good will result. There is one source of consolation always at hand when photographers are confronted by competition of this character, and that is, that the man who produces really good work will not, as a rule, find his business affected by the coupon systems of disseminating three-quarter life-size enlargements at 6*s.* 3*d.* each, notwithstanding that, as stated in Mr. Pearson's offer, "these pictures, if ordered through artists, would cost you from three to five guineas."

THE RIGHT TO THE NEGATIVE.

THIS question is continually being brought before the Courts, though one would have thought, from the many decisions that have been given upon it, the point was settled long ago. Not so, however, for, on Tuesday last week, Mr. Edwards, of Peckham, was sued in the Lambeth County Court for damages for the detention of eighteen photographic negatives of certain monumental works. The negatives, it seems, were taken in the ordinary course of business, and the plaintiffs, a firm of monumental masons, claimed them as their property. During the hearing of the case one or two points of interest worth noting were raised. For the defendant it was contended that the negatives, under the Copyright Act, were his property. Judge Emden said, as a matter of law, that was so. The other side argued that, as the negatives were taken as a matter of business, they were included in the charges. But the Judge said there is a decisive case on this very matter, and he well remembered it, as he was counsel in the case, and by the decision the photographer was held to be the owner of the negative. Plaintiffs' counsel contended that the question at issue was not one of law but of fact, and put in invoices, charging the plaintiffs for "taking negatives and supplying copies of photographs," &c., as supporting his view that the negatives were taken for the plaintiffs. The Judge, however, said that there was no evidence that there was a special contract, or that the negatives were specially paid for, adding that, if the plaintiffs' solicitor's contention was right, a person sitting for photographs should be entitled to claim the negative. In the end judgment was for Mr. Edwards with costs. On the question of an appeal the Judge advised that the plaintiffs should take time to consider the matter, and remarked that, "when the public want negatives, they should take care to establish a special contract."

There is not much difference between this and other suits that have been taken into Court, except one point which it is well to make a note of, as it still further strengthens the photographer's property in the negative. It is this: In this case the invoices were worded in this way, "taking negatives and supplying copies," &c. Now, we have more than once strongly recommended photographers to make no mention of negatives in making their charges, as it might be construed as a special charge for them by the Court in some instances. In the present case it clearly was not. However, we still advise that no allusion be made to the negative, or the taking of it, in invoices, as in future cases the Judge that is called upon to adjudicate may not be so well versed in the custom of the photographic profession as is Judge Emden.

Röntgen's Work in High Quarters.—It is stated that the German Emperor is indebted to the use of a Röntgen photograph for a knowledge of the true condition of the bones of his arm, that have brought about the well-known imperfection that he suffers under.

New Reagent for Bromine and Iodine.—Mr. J. H. Kastle, in the *American Chemical Journal*, states that dichlorobenzenesulphonamide liberates bromine and iodine from metallic bromides and iodides, and can be used either in the solid state or in carbon bisulphide solution. It may be used instead of chlorine water, but, like this, excess must be avoided, otherwise iodine tetrachloride will be formed. It is possible to recognise the presence of iodine in solutions containing ·0000127 and ·00000635 grain, together with ·04 and ·00036 grain bromine respectively.

Chloride of Silver and Hypo.—In 1894 Valenta argued that the formula for the mutual action of these two substances as usually given —$3Na_2S_2O_3+2AgCl=(Ag_2Ns_43(S_2O_3)+2NaCl$ — was not correct, but Ernst Cowen qualifies this declaration. If the silver chloride is not present in excess, he holds the equation to correctly state the phenomena; but, if the chloride be in excess, a less soluble salt—$(AgS_2O_3Na)_2$—is formed. He thus verifies the results postulated thirty years ago by MM. Davanne and Girard in their classical researches on the causes of fading of silver prints.

Italian Naval Nomenclature.—One of the earliest items of intelligence from Rome, after the receipt of the disastrous news from Abyssinia, was to the effect that the warships *Bromida* and *Plata* were about to be dispatched to Africa with reinforcements. This looks as if the Italian Government are making a new departure in the naming of their men-of-war, and if, having started with the two most important constituents of the modern dry plate, bromine or bromide and silver, they follow on with gelatine, collodion, pyro, ammonia, hypo, &c., or their Italian equivalents, their fleet will look almost as formidable on paper as on the sea.

Death of a Renowned Portraitist.—The death of Mr. George Richmond, R.A., is announced as having occurred on Thursday, last week. He was born in 1809, hence he had attained a good old age. During his long lifetime he produced between two and three thousand portraits, many of which have been engraved. The deceased artist was identified more especially with a particular style of work known as the Richmond head. This style of work has been largely imitated in photographic enlargements, and one well-known firm of photographers in London, a few years ago, made a special feature of "Richmond heads," in which they did a considerable business.

The National Portrait Gallery.—At last there is some prospect of this Gallery being open to the public in the near future. In reply to a question put in the House of Commons one day last week, Mr. Balfour said that he understood the Trustees proposed to open the Gallery on April 4, "provided the appointments in the staff of curators, resident officers, and police are sufficiently advanced to enable them to do to. Therefore there is some doubt about the date' but the Curator hopes it may not be very long after that time." One would have thought—at least, any one with business ideas—that, in an affair of this kind, the appointment of the staff would not be left till everything else was completed, and then be made, if necessary, a reason for a delay in the opening. Alas, for Government "red tape!"

Artistic Posters.—An Exhibition of Posters is now open at the Royal Aquarium. It is one that we imagine the photographer will take but little interest in. To him the poster, however artistic it may be, is a nuisance of the first degree. How often is what would otherwise have been an artistic "snap-shot" picture completely spoilt by some obnoxious advertisement. Again, how often has the photographer to forego an interesting landscape, unless he is content to include advertisements of quack nostrums, soap, foods, &c.! Painters are agitating for the abolition of this class of advertisement, and all credit to them; but they are, after all, in a better position than photographers, as they can omit them from their works, but photographers perforce have to include them if they take the picture at all.

Telescopes for Photography.—The supposed expense of suitable instruments has had a deterrent effect on some who would like to utilise their small telescopic possessions in photographic directions; but, as has already been shown, work of high value can be carried out with no more costly instrument than an ordinary magic-lantern lens, and in the *Astronomical Journal* is a paper by Professor Schaeberle on the relative value for the purpose of reflecting and refracting telescopes, the latter when of large proportions being, as is well known, of immense cost. He gives it as his opinion that photographs of planets taken by an instrument of the former class with a focus of from twelve to fifteen feet will be equally good as those taken with the most powerful of the expensive type.

Edison and Röntgen Rays.—A paragraph has been going the rounds of the papers, to the effect that Mr. Edison has been experimenting with an immense number of bodies in regard to their possible fluorescing power under Röntgen rays—over 1800 has been named, but the chemical chosen is said to be shrouded in mystery. Be that as it may, Mr. Edison, according to a paragraph in last week's *Nature*, has telegraphed to Lord Kelvin, in the following words: "Just found calcium tungstate, properly crystallised, gives splendid fluorescence with Röntgen rays, far exceeding platinocyanide, rendering photographs unnecessary." As there is no reason to doubt the genuineness of this telegram, it is evident that, if the luminosity is so great as is suggested, the tungstate will form a new weapon for the surgeon far exceeding in practical importance the photographic results of the new discovery.

Are Röntgen's Rays of Cathodic or Anodic Origin?—A new reply to this already confusing problem is already given by Mr. H. Espin. He has been making a considerable number of experiments to determine the question by placing Röntgen opaque screens in various positions with regard to the Crookes' tube. He had, with others, been struck with the fact that he sometimes obtained double images, as though two radiant points were connected with the issue of the rays. He placed thick sheets of metal at right angles to the dry plate; he used also a series of short lengths of brass tubes. He summarises his results and conclusions in a letter in the *English Mechanic*, last week, as follows: "The explanation of these results is simply this; that besides the cathode rays there are as well anode rays," and he gives a diagram explaining how the multiplication of the shadows is brought about under this assumption.

Respirability of Acetylene.—It has been stated that the respiration of air impregnated with small quantities of acetylene was inimical to health: but, from experiments made upon dogs by Nestor Gréhaut, Marcellin Berthelot, and Henri Moissan, it would appear to be much less poisonous than ordinary coal gas. A mixture of coal gas, air, and oxygen, containing twenty per cent. of the latter, was nearly fatal to a dog after ten minutes breathing it; but twenty volumes of acetylene, 20·8 of oxgen, and 59·2 of nitrogen, produced no visible effects after a respiration, though, when the acetylene was increased to forty volumes, the dog died in less than an hour. Berthelot, in experiments made some years ago, found that a few per cents. per volume of acetylene present in air had no injurious effect. It is clear, therefore, that no trouble need be apprehended from an occasional slight leakage of acetylene in the air of a living room.

Further Surgical Results.—Mr. A. F. Stanley Kent, of St. Thomas's Hospital, is credited with being the first to photograph the bones of the entire human trunk. His sciographs show those portions of the body lying between the fifth rib and the pelvis. The space occupied by the kidneys is rather denser than the surrounding tissues. Then also Mr. J. Macintyre, writing from Glasgow to *Nature*, states that he has used a cryptoscope, and "been able to look straight through a skull, in which I had placed two or three bullets, and I had no difficulty whatever in seeing shadows of them, although somewhat enlarged." He has photographed the inner table of the cranium, the upper part of the spine in the neck, and half the spine

and vertebræ of an adult. It is rather difficult to understand the meaning of the quoted portion of his letter, seeing that the "inner table" is the inner of the three layers of bone of which the skull bone is composed.

The Metric System in America.—It is stated that a Committee of Congress has under consideration a Bill to render metric weights and measures compulsory in all official transactions, and it is reported that the majority of its members are in favour of its becoming law at an early date. It is proposed to make the system compulsory in all Government Departments on July 1 next year, and, after July 1, 1899, it is to be the only legal system of weights and measures recognised in the United States. It is surmised, if the system is mandatory in all Government Departments, that the example would be quickly followed in all private contracts. At present England and America are about the only countries that have held aloof from the metric system. At various times attempts have been made to introduce the metric system in photography in this country in place of the present grains, drachms, and ounces, but to no purpose. All Continental formulæ are given in the metric system, and most know the trouble some have in accurately translating them into our grains and ounces.

An Acetylene Lamp.—The *Scientific American* has recently given an illustrated description of a new lamp designed by the well-known French scientist M. Trouvé, for burning the new illuminant somewhat upon the style of a paraffin or petroleum lamp. The gas is produced in a manner similar to that already designed for acetylene generators. An outer glass vessel contains a smaller one of the same material, which contains a metal cage for the calcium carbide in layers separated from one another by discs of glass, to keep the production of gas under control. One difficulty in designing a lamp consists in the condensation of moisture in the tubes leading to the burner. This he has done by using two concentric tubes connecting with the top; at first the gas passes through both to the burner; then, when the water begins to condense in the inner tube, it seals it and acts as a siphon, the gas continuing to pass to the burner through the outer tube and the siphon action going on the whole of the time. Further initial condensation is brought about by a large plate of iron attached to the inner tube. The average consumption of this new lamp is about 3¼ ounces of carbide for thirty-eight candle hours.

Light Storage.—This topic, once the subject of intense interest and heated discussion in photographic circles, referred to what might be termed invisible light, but at the meeting of the Paris Academy of Sciences, held last week, M. Henry described experiments on light storage when the illumination was to be visible as well. After trying phosphorescent tablets of zinc sulphide rendered luminous by ten minutes' exposure, he subjected them to various influences with the idea of arresting, yet not destroying, the light-emissive process. Experimenting with electro-magnets and various coloured glasses, also the compression of the sulphide of 100 kilogrammes to the centimetre, he obtained little or no result, but, struck by the effects of addition of heat in increasing the light emission and of obstruction in destroying it, he was seized with the idea of trying extremely how temperatures and the results were a complete success. He plunged a luminous tube in a freezing mixture, at a temperature of 79° C. The luminosity was entirely destroyed, and, upon withdrawing the tube, there was no light visible, but, as soon as its temperature arrived at that of the atmosphere, the sulphide once more began to glow. This is, after all, a matter of theoretic interest only, for, as M. Trouvé points out, it is only in polar regions where you can get cold without labour.

Weather Forecasting.—Three weeks ago, it will be remembered, we gave Mr. Clements' weather predictions for the current month, so that our readers could judge for themselves as to their correctness. Last week the annual report of the Meteorological Council to the Royal Society was issued as a Blue-book of the smaller type. The United Kingdom is studded all over with stations, from which observations are being constantly received at head-quarters. These centres extend from Jersey and the Scilly Isles to the Shetlands. In addition to these there are some thirty or more Continental stations. From the reports received from the centres forecasts are issued three times a day, and are for the next twenty-four hours, dating from the time being. It is claimed for the forecasts issued in the evening that fifty-six per cent. of them proved correct, while twenty-seven were partially correct. We are told that "partial" implies "more than half." For the forecasts in reference to the hay harvest, when, by the way, the weather is generally pretty settled, it is claimed that sixty-one per cent. of them were successful. However, the Board of Agriculture, after an extended trial of these forecasts, have since dropped them.

It would be a little interesting to know how many photographers rely upon the weather forecasts for the day when they have any important work on hand. It would also be interesting to know how the words "perhaps," "possibly," "probably," &c., count in compiling the complete and partial successes in the forecasting as given in the report. Some people think that, for the fifteen thousand pounds or upwards granted yearly to the Meteorological Department, we should have more accurate forecasting than we get, considering that it is only for the ensuing twenty-four hours.

Photographing at the National Gallery.—The correspondence, published in our last issue, between Mr. Craigie and the Secretary to the Trustees of the National Gallery, seems, at first sight, a little hard on amateur photographers. But, after all, it is not so bad as it appears. Professional photographers are, without restriction to nationality, allowed to photograph the pictures, under certain conditions, before ten o'clock in the morning, and on students' days; but, if an art student requires any particular picture, he or she has the preference over the photographer, and the latter must put off his work till the former has done with the picture — sometimes a question of weeks. As a rule, the painter student can work from the picture *in situ*, whereas the photographer must have it removed, and unglazed, with, of course, a certain amount of risk to the painting. Further, the Trustees know that, when permission is accorded to a professional, the reproductions will be disseminated far and wide, to the benefit of art students generally, while those of the amateur will be confined to his own folio, or perhaps those of a few friends. Therefore, it is not so very unreasonable that the Trustees will not allow the public to be incommoded by cameras even on students' days, for the individual amusement of their owners. The sentence in Mr. Craigie's letter, "If there is one branch of photography where amateurs can excel, it is, I think, in the reproduction of pictures, involving, as it does, an immense amount of time and attention, such as the professional is rarely able or willing to afford," will take many by surprise, if not cause amusement. No professional would think, for a moment, of applying for permission to photograph in the Gallery without being prepared to give the necessary "time and attention" to the work, as well as the skill and experience requisite to secure the best results. Without these he would know that the copies would have no sale and the venture would be his loss. Where is the amateur that can excel the published photographs of the pictures in the National Gallery?

Very Juvenile Photography.—We often hear of the practical interest taken in photography in our public schools, and we occasionally see a youngster, scarcely in his teens, enthusiastically amusing himself and his schoolfellows with a photographic apparatus, possibly a present from some kind old "Uncle Jack." When we do, we look upon the juvenile as an embryo photographer of the right type. Last week our amateur contemporary chronicles (?) juvenile photography in the older days, which quite eclipses anything in modern times. It says: "At the third meeting of the Photographic Society, held on April 7, 1853, Mr. Samuel Fry exhibited what he regarded as the first photographic camera made in this country, an instrument made for him in 1839 by Mr. Edward

Palmer, of Newgate-street," &c. The late Mr. Samuel Fry died in 1890, aged fifty-six. Consequently, in 1839, when the camera was said by our contemporary to have been made for him, he was but five years old. This quite "beats the record" in photographic infant prodigies. When chronological events are recorded, they should be accurate, otherwise they are misleading, and as such may possibly be perpetuated by the rising generation of photographers if they remain uncorrected. As a matter of fact, the camera alluded to was shown by Mr. Peter W. Fry, no relation whatever to the late Mr. Samuel Fry.

Mr. P. W. Fry was one of the first, the very first, workers of photography in this country, and an ardent experimentalist of the old school. He was contemporaneous with F. Scott Archer in the invention of the collodion process. Writing in 1852, Hunt (third edition) says: "The successful application of a solution of gun-cotton in ether to form the film for receiving the sensitive surface on glass appears to belong to Mr. Fry and Mr. Archer. There is some difficulty in fixing precisely this point, since the dates of actual publication are very uncertain." This Mr. Fry was one of the founders of the Photographic Society of London—now the Royal Photographic Society—and served as a member of its Council for years. It may be mentioned that the first President of the Society was Sir Charles Eastlake, then President of the Royal Academy. At that period artists did not treat photography with the contempt that some affect to do now.

Glass Cells for Orthochromatic Purposes.—Several correspondents have called attention to the method of building up glass cells for the coloured solutions employed, to wit, of the blue and violet rays referred to by Mr. F. H. Burton in a previous issue, pointing out that the process is far from being so easy and simple as that gentleman would seem to wish to convey, while the result is scarcely to be relied upon to stand much rough usage, or even the ordinary wear and tear of studio work. No mention is made of grinding the edges of the glass plates forming the sides of the cell, which would be absolutely necessary if they were built up in the manner suggested; and, even when this was done, the cemented edges would be extremely liable to separation on the slightest jar. A far better way, it is claimed, and we think with justice, would be to place the strips of celluloid—or, better still, of glass of definite thickness—*between* the edges of the side and squares, when they would not only have a firmer hold, but would be protected by the sides from any chance knocks.

But we would suggest an even simpler plan, which we can answer for from past experience as being quite efficient. It is due, if we remember rightly, to the ingenuity of the late Mr. Walter B. Woodbury, and was, we believe, first described in a little pamphlet, *Science at Home*, published by the Sciopticon Company as a means of improvising a trough or cell for exhibiting chemical and other experiments with liquids in the lantern. The basis of the cell consisted of a wooden frame similar to, but rather thicker than, an ordinary lantern-carrier, and having a circular opening about two and three-quarters of an inch in diameter, or any smaller size. The top side of the carrier is open in the centre, and into this well are dropped or pushed two ordinary lantern slides of plain glass, separated by a piece of indiarubber tubing bent into U shape, and of such thickness that, when the plates are pushed home, the tube is squeezed tightly between them, forming a waterproof trough open at the top. For orthochromatic purposes several modifications will suggest themselves, but the principle remains, and we can speak as to its efficacy. This little device was exhibited at the Photographic Club some years ago by the late Mr. George Smith of the Sciopticon Company.

JOTTINGS.

I should like briefly to endorse the appeal that has been published on behalf of poor W. H. Harrison. Of all the appeals that have recently been made, this is surely the most deserving, for what could be more tragic than the fate of being suddenly reduced to impotence and helplessness in the prime of one's life and intellect? Harrison's work in photographic journalism has extended over a period of nearly thirty years. He was a cultivated writer, and a man of well-grounded practical and theoretical knowledge. Moreover, it must not be forgotten that to him the world is indebted for the first published suggestion for the emulsification of the silver haloids in gelatine. His literary work was by no means confined to photography, although it was in connexion with the latter that he was best known. I hope that a liberal response will be made to the appeal. The Hon. Treasurer is Mr. F. H. Varley, 82, Newington Green-road, N.

A friend is kind enough to forward me a couple of newspaper extracts, which I append in parallel columns. They relate to the Röntgen rays, or "new" photography, of which they take views that it would be hard to find in greater contrast or more diametrically opposed to each other. Röntgen's lucky accident has been one of the most fortunate finds that medical and surgical science, and consequently human pain and suffering, have had for years, and yet the *Pall Mall* young man is "sick of the Röntgen rays," and would like to "execute all the discoverers;" and so on, through a series of pitiful puerilities which are supposed to pass as smart writing. Mr. Astor's paper evidently wants some new and common-sense contributors, as well as a new editor. Contrast the *Pall Mall's* exhibition of ignorance and stupidity with the weighty and sensible observations of the *British Medical Journal* on the same subject. That contrast, as my friend remarks, is striking, and it will grow all the more striking as time goes on.

Pall Mall Gazette—

"We are sick of the Röntgen rays. It is now said, we hope untruly, that Mr. Edison has discovered a substance—tungstate of calcium is its repulsive name—which is potential, whatever that means, to the said rays. The consequence of which appears to be that you can see other people's bones with the naked eye, and also see through eight inches of solid wood. On the revolting indecency of this there is no need to dwell. But what we seriously put before the attention of the Government is that the moment tungstate of calcium comes into anything like general use it will call for legislative restriction of the severest kind. . . . . Perhaps the best thing would be for all civilised nations to combine: to burn all works on the Röntgen rays, to execute all the discoverers, and to corner all the tungstate in the world and whelm it in the middle of the Atlantic. Let the cetacea contemplate each other's bones if they like, but not us."

British Medical Journal—

"In spite of the attention which has from the first been given to the subject of the new photography, it seems difficult to get the general public to take a rational view of what the new process can and cannot achieve. We are in great danger of an anti-climax, during which the pendulum of public opinion will swing back and demolish the solid structure of practical utility which the science of skiagraphy has already built up. Wild talk about photographing the interior of the brain, the processes of digestion and respiration, &c., can only lead to unreasonable disappointment. . . . . We must therefore wait patiently till those engaged in investigating the discovery have provided the means for such work, and avoid the sad results of over-estimating a discovery which, relegated to its proper position, will be of the greatest benefit to surgery and mankind at large."

I am informed by a member of the Royal Photographic Society, who, however, seldom attends any of its gatherings, or takes any more active part in its affairs than the regular payment of his subscription, that the last meeting of the Society's Council was enlivened by the performance of a screaming farce. Mr. H. P. Robinson was proposed for election as an Honorary Fellow—and was not elected. Matters of this kind are, I should have thought, best not made public; but, evidently, some members of the Council think otherwise, for the news, figuratively speaking, is all over the place. Perhaps, though, this is scarcely to be wondered at, for nothing could be more laughable or absurd, or difficult to treat seriously, than the proposal to make Robinson an Honorary Fellow of the Royal Photographic Society—except, possibly, Robinson's acceptance of the compliment if

it were conferred upon him. And now, to carry on the sequence of topsy-turveydom, I am wondering if we shall hear of some waggish Salonite proposing *me* for membership of the Linked Ring?

The Photographers' Benevolent Association is dead—with three hundred pounds in the bank, or rather, under the control of the Registrar of Friendly Societies, who appears laudably anxious to give his consent to the money being handed over to some suitable body who will disburse it in a charitable or benevolent manner. At present no body or society has been discovered who can, will, or is able, to step temporarily into the discarded shoes of the P. B. A. and get rid of the money. The bitter irony of the position is that there is plenty of call for it. I myself, within the past few weeks or so, have been the recipient of no less than four letters from needy photographers seeking help, whose cases were just those that the Benevolent might have been glad to deal with. But not one of the four—no, not one—had ever subscribed a single penny to the funds of the P. B. A., or had stirred so much as a finger to keep it alive.

What with the Röntgen rays, kinetoscopy on the screen, and the stereo-photo-chromoscope, the various photographic societies have found, during the winter that is leaving us, plenty to talk about and discuss; all three subjects, indeed, have given quite a new impetus to photography. The fact that a number of professional photographers have laid themselves out to take radiographs for surgical purposes is quite a consolation to me, who, at the risk of being called hard names, have so often, in this column, scolded the fraternity for its callous and conservative indifference to new ideas. Animated photographs on the screen, moreover, is a field the outside boundaries of which have only just been touched, while, as I gather from Mr. F. E. Ives and Mr. Edwards that stereo-photo-chromoscopic cameras for securing photo-stereographs in colours are likely to be marketable articles, amateur photography should also find, in the near future, new scope and new pleasures; and not before it wanted both.

COSMOS.

CARBON PRINTS WITHOUT TRANSFER.

THE subject of carbon printing without transfer has been on the *tapis* for some time, and there seems to be no reason to doubt that for some purpose, and under certain conditions, it is quite feasible. I am not going to argue the point as to whether the text-books have been all along wrong in teaching that development from the back of the exposed tissue is an absolute essential to success; on the contrary, it is my intention to suggest an application of what I may deem the method of printing which I have little doubt may be worked out to an advantageous issue. I have seen many examples of carbon printing by the direct method produced both anterior and subsequent to the advent of Swan's process, by Blair, Pouncy, and others, but I scarcely think that any unbiassed judge would hold them to be equal in technical excellence to the best or even to the ordinary run of transfer prints. The prominent features of all such pictures that have come under my notice have been want of delicacy in the finer details, and heaviness and want of transparency in the shadows.

I have not had the good fortune to be able to examine any of the more modern examples of this class of work, but I can see no reason why what was impossible two or three decades ago should suddenly become easy at the present day; although I am willing to admit that, with the more modern methods described by Mr. Alfred Maskell and M. Demachy, perhaps better results are obtainable than was formerly the case; their acceptance is probably as much due to a certain change in popular taste as to any very marked improvement in quality. The increased popularity of matt-surface effects on rough and smooth paper has, no doubt, done much to pave the way for a class of pictures that would scarcely have secured favourable notice in the days when albumen prints were the standard of excellence.

But, turning to the technical side of the question, I scarcely think that Mr. Alfred Maskell's description of the kind of film required correctly explains the rationale of the process or its possibility. He says: "The object to be aimed at is a deposit of colour held in suspension in just sufficient of the gum so that each grain of colour is separate, as it were, from its neighbour, and not one on top of another." Practically this is an impossibility; but, even accepting such an ideal film, the production of gradation in any form from a negative in natural half-tone is an obvious impossibility, for wherever the light acted, whether in the deepest shadows or in the most delicate gradations of the high lights, the effect would be the same. There would be no depth of colour to give force to the shadows, while in the lights each individual particle must either be rendered insoluble or else be left in a condition to be washed away on development; in the one case the lights would have the same depth as the shadows, in the other they would be perfectly bare.

Undoubtedly the possibility of the process depends upon, in the first place, the extreme tenuity of the sensitive film and the exquisite fineness of division of the colouring matter; but beyond this we require some explanation of how or why in the half-tones and finer gradations the action of the light is not as great as in the shadows. Remember, we are supposed to be working with a film composed of a single layer of particles of colour of practically equal size—or it may even be of a multiple layer of particles infinitely small. In the first case any action of the light, whether in the shadows or half-tones, must render insoluble the whole thickness of the layer; or, in the second case, the surface of the layer is rendered insoluble, and the underlying particles confined, which amounts to the same thing. This is, in fact, the old text-book teaching of the principle of the process.

But the supporters of the new method refer to a certain granularity of the film as being necessary, not only for the due penetration of the light, but also for successful development, and there can be little doubt but that it is to the partial granularity, combined with extreme tenuity of film and fineness of division of the colouring matter, that the production of an image in half-tone is due in the first instance. But an equally important point in the argument will be found, I think, in the choice of the vehicle or binding material in which the colouring matter is held, and it will be noticed that both Mr. Maskell and M. Demachy employ pigmented gum. I do not mean to infer that the employment of gelatine would render the process unworkable; on the contrary, the very practical method of Mr. W. H. Sherman referred to in these pages a few weeks back is based upon the use of gelatine—but I think gelatine would render the task more difficult by reason of its giving a more homogeneous film or one in which it would be more difficult to secure the necessary degree of porosity or granularity.

Besides this, the solubility of gum in cold water is another point in favour of ease of development, the higher temperature necessary for the solution of the unacted-upon gelatine would have a tendency to loosen and wash up the isolated portions forming the shadows and half-tones of the picture. With gum, on the contrary, the chief portion of the development could be performed with cold water and very slightly tepid or a lukewarm temperature resorted to to clear the half-tones. Here is where I fancy the whole possibility of the process rests. We know, in printing the ordinary carbon tissue, it may be quite insoluble in water of a certain temperature; but, if a greater heat be applied, the half-tones may be lightened without materially affecting the more powerfully impressed portions. In the case of the direct printing method, it is the application of a moderate temperature that softens and dissolves the underlying particles of colouring matter and gum without so acting upon the indurated surface layer, and this, by virtue of its porosity or granularity, allows the dissolved portions to escape through the interstices. Gelatine, by reason of its greater continuity or homogeneity of film, would be more likely to retard, or altogether arrest, the escape of the soluble colouring matter, as, in fact, it does in the ordinary process.

A word or two on the subject of the production of the granular or porous film. Here, again, I think gum especially, and albumen in a less degree, will be found to favour an open film on account of their semi-crystalline character when in the dry state, but that openness will be still further increased by the presence of crystalline potassium bichromate. All carbon printers are aware of the necessity of keeping down the proportion of the bichromate to gelatine in order to prevent crystallisation of the salt on drying, and it is one of the

points in favour of the sodium salt that a larger quantity can be used without introducing this trouble. But the tendency to crystallisation is much greater in the case of gum than with gelatine, and partakes of a different character, being finer in form, and, in fact, always present more or less, though it may not show on the surface, however small a proportion of the chromium salt may be used.

Thus, whereas, in a film of gelatine carrying a moderate proportion of bichromate, the cohesiveness of the vehicle masks or altogether prevents crystallisation, in the case of gum, and to a less degree with albumen, on drying, the semi-crystalline film breaks up into innumerable minute particles of pigmented gum separated by equally minute crystals of potassium bichromate. On exposure to light, the former are, on the surface at least, rendered insoluble where the separating crystals are left soluble, and on development are washed out and form the interstices or channels through which the under layer of soluble matter is washed out of the half-tones. The crystalline or granular character of the film will be found to be greater if the bichromate is mixed with the pigmented gum before coating than when it is applied afterwards in solution, and the degree of granularity can be varied within very wide bounds by altering the quantity of salt used, as well as by mixing the ammonium and sodium salts with bichromate of potash.

From experiments I have recently made in the direction of Artigue prints, I believe that a method on somewhat similar lines will be found useful in photo-etching and engraving, as it forms a "resist" which, while offering a certain amount of grain, adheres far more firmly to the copper or zinc plate during the process of "biting." For this purpose, however, gelatine would seem to be preferable to gum, or, at any rate, a certain proportion of it seems to give a stronger film, and the fact of its being applied in solution to the freshly cleaned or grained metal plate goes farther to ensure its more perfect adhesion than would be the case with mere squeegeeing.

In conclusion, let me say that, while, under the conditions given above, I fully believe in the possibility of successfully rendering half-tone without transfer, I am still of opinion that the text-books are strictly correct in their teaching, that the perfection of gradation is only possible by one or other of the transfer methods.

W. B. Bolton.

INSIDE SOME LONDON STUDIOS.

No. I.—Mr. Thomas Fall's.

Probably among his brother professionals no photographer is better known or more respected than Mr. Thomas Fall, of Baker-street. On a recent visit to that well-known studio we found Mr. Fall engsged in his favourite occupation of answering letters from photographers in various parts of the country who were seeking his advice on points of practice, charges to sitters, studio construction, and other matters, in all of which Mr. Fall's long experience is invaluable. Then we were interrupted by a sitter, whom Mr. Fall, with characteristic adroitness, instantly put into a good humour with a racy anecdote or two, and we had leisure to wander about the reception-room, admiring the specimens, which include carbon and platinum prints of great beauty, as well as albumen prints, to which process Mr. Fall, in common with many other workers, is inclined to revert.

Taking leave of the reception and dressing-rooms, which are marked by quiet taste and homelike attractiveness, we proceed to explore the studios, of which, at Baker-street, there are two. The principal one is the larger, and most of the work is done in it, although occasionally the smaller one is utilised. The dimensions of the studio are: Length, about 30 feet; height at apex, 14 feet; width, 18 feet; height to north aspect eave, 8 feet; to south, 7 feet. Ground glass is used for glazing purposes, the north light being controlled by spring blinds of greenish-blue fabric. The accessories have been selected with an eye to naturalness of effect in the resulting photographs, and they include a few upon which dogs can be posed, for, as our readers may be aware, Mr. Fall (himself a great dog-lover) devotes much attention to this kind of work.

Dependent from the roof, and sliding in a groove at the apex, where it is controlled by a ball-and-socket movement, is a kind of large portable tunnel, consisting of a metal frame covered with baize. This is suspended over the camera, and may be easily moved to and from the sitter. Mr. Fall terms it a luxury, and says he finds it especially useful in preventing the accretion of atmospheric fog between the sitter and the lens.

The studio on the south side is likewise glazed at the angle of the roof, spring blinds being also available; and, as we notice this fact, Mr. Fall takes occasion to put us in possession of his views with regard to the use of reflectors for lighting the shadow side of the face. Directing a small boy to be seated, he asks us to judge of the relative effects of lighting the shadow side of his face with a reflector, and by means of direct light controlled by blinds. In the one, Mr. Fall points out, the cross light is made disagreeably conspicuous in the eyes of the sitter, while, by judicious use of direct light, this is avoided, and generally a softer effect of lighting is obtained. Another point upon which he is emphatic is the mistake of having an excessive height of studio, the effect of which is to concentrate too much top light on the sitter.

Mr. Fall's admiration of retouching is limited. Indeed, when it is carried beyond what he considers it to be its legitimate sphere, viz., the removal or softening down of defects, he becomes an opponent of it. Pressed as to whether lady sitters are not responsible for the abuse of retouching, he dryly informs us that the men, and old men at that—including artists—are generally as bad as the ladies in this respect, and sometimes worse.

Naturally, we engage Mr. Fall to talk to us about dogs, on which, photographically and generically, he is an authority. Everybody is familiar with Fall's dog photographs, and it is safe to say that, in the domain of canine portraiture, he is not beaten. But we are as much impressed with the following sentiments on the subject of dog photography as with the actual photographs. "This," says Mr. Fall, "is the age of the dog. The regard in which he is held was never greater. The affection bestowed on dogs is only inferior to that with which children are looked upon. Ladies in particular, who have no children, find their best substitutes in dogs. Drawings, paintings, and photographs of dogs are, consequently, thought more highly of than ever they were, and the photographing of dogs is daily becoming more and more lucrative than the photographing of their owners. But, of course, as you say," concludes Mr. Fall, "it is not easy work at the first go off. You must know your dog—and it's a good many years since I took my first dog photograph."

Many a time in these pages, of recent years, have we and others discussed the question whether albumen printing has received its death-blow. Mr. Fall admiringly hands us a batch of exquisite albumen prints, and utters the formula we have heard issue from so many photographers' lips, "Nothing like a good albumen print after all." "But give me the paper of thirty to forty years ago," he continues, "and I will ask for no other." Remarking on the absence of the electric light installations from all his establishments (for Mr. Fall has branch studios in Finchley-road and Bayswater), our host appeared to think that "the electric light for portraiture" might be useful as an advertisement, but that, practically, it is not much availed of.

The honourable place Mr. Fall has won in the profession is the result of hard, good, and persistent work. He is sixty-three years old, and has been in business for himself about half that time. Many of his assistants have been with him over twenty years, than which he requires no other testimonial as an employer. He is, as we have already hinted, the kindly willing adviser of large numbers of his brethren all over the country; a warm supporter of any movement started for the advancement of photography; but, with native bluntness, gives it as his opinion that a professional photographer cannot make constant attendance at society meetings compatible with commercial success.

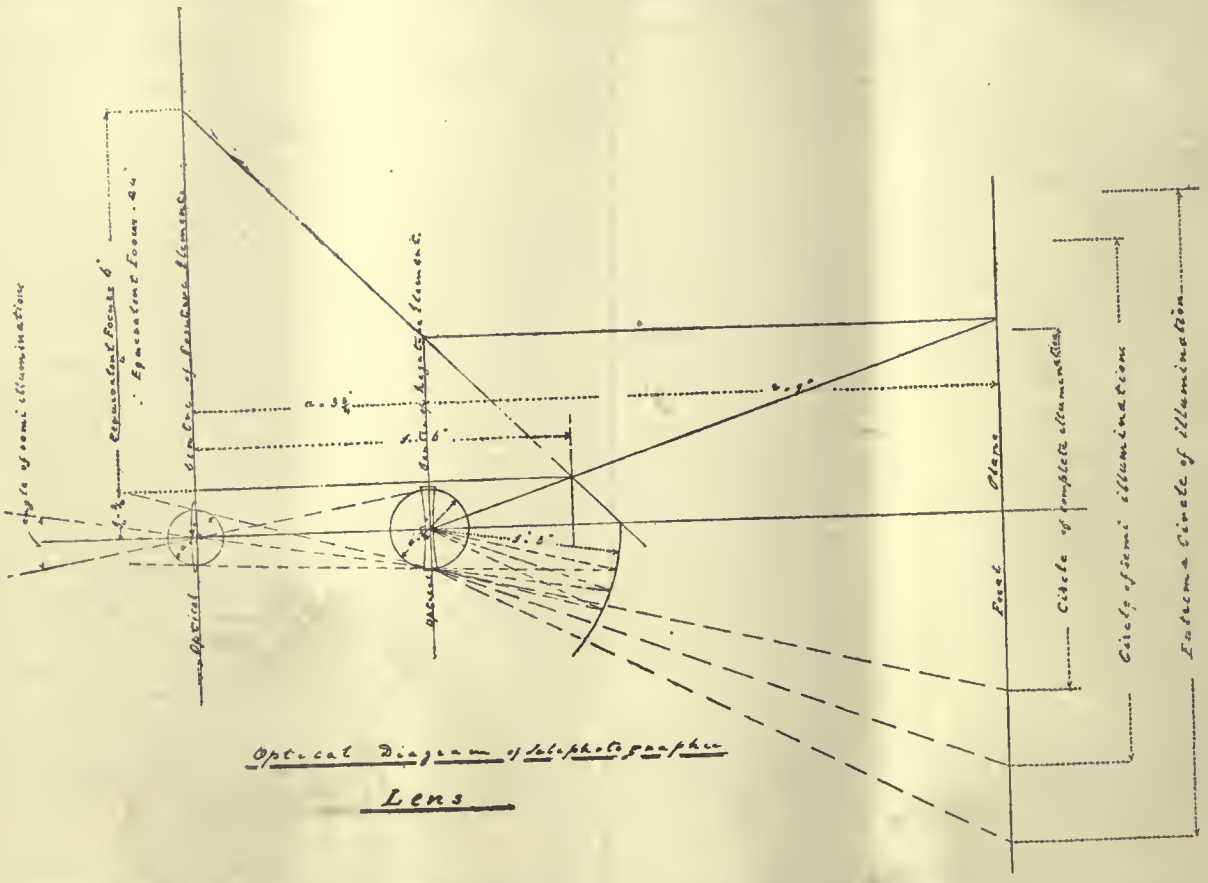
TELE-PHOTOGRAPHIC LENSES BY GRAPHIC CONSTRUCTION.

Mr. Charles Louis Hett writes: "In your issue of August 4, 1893, you published a very useful diagram on the above subject by

Mr. Hancock, of Cardiff. The assistance which I have derived from this diagram has induced me to extend it so as to show at a glance the whole effect of any tele-photographic combination.

"I enclose an example which I think may prove of interest to many of your readers. In order to facilitate comparison, I have employed the same data as those which were used by Mr. Dallmeyer (THE BRITISH JOURNAL OF PHOTOGRAPHY, July 28, 1893), and adopted by Mr. Hancock in constructing his diagram.

"It will be observed that I have used one-quarter of the equivalent and negative foci in the vertical component of the construction. This is simply a matter of convenience. Were the full foci used, an acute-angled triangle would result, and consequently greater liability to slight error."



COPYING.

[London and Provincial Photographic Association.]

In the first place, for copying, you must have a camera and lens, and these should be chosen with regard to the class of work to be done. If money is no object, then get the best of both sorts; but, if it is, then, if the subjects to be copied are photographs or pictures where a slight falling off in definition does not matter, a good rapid rectilinear lens will answer the purpose But, if you want to copy line work or fine dotted engravings, the definition must be of the best, and therefore the cheapest lens in the long run will be one of the newer forms which are free from astigmatism, for, if a rapid rectilinear lens be used for that purpose on a somewhat dull day, you have to use such a small stop that you cannot see to focus, and therefore your focus is but guesswork, and, if a moderately large stop is used, the negative seems to show signs of vibration, the lines one way being sharp, and those at right angles being blurred. The lens also should not be of the shortest possible focus, as, when copying the same size or larger, the camera will be so close as to throw a shade across part of the picture, though, for copying very large pictures to a very small size, it may be of advantage to have a short-focus lens, as it may save getting the subject too far from the source of light when copying in an ordinary room, or save getting too far away from the subject when the atmosphere is hazy, which might flatten the resultant negative.

A heavy camera has a great advantage over a light one, and should have the back focussing adjustment, as that saves a great amount of time in adjusting and focussing, and is easier working, as you will frequently have the camera at its full extension; but the front focussing camera can be used; but, when copying near the same size or larger, the body of the camera must be shifted each time the lens is, otherwise it is easily seen that, as there is but one point of focus, and that may give too small an image, if the lens is racked forward, the size of the image will increase, but definition is lost, and can be regained by sliding the camera bodily backwards. If the camera is a light one—and most of the front focus ones are, I think—it will be advisable either to weight it, or have some arrangement by which it can be clamped. Mr. E. J. Wall recommends a camera fixed to a board, which slides in grooves, while the board, to which he fixes his picture, moves all ways to enable him to centre it properly.

A cheap and convenient stand I have had made consists of a four-legged table stand, five feet six inches long, fourteen inches wide, and three feet nine inches high, at one end of which is a board, fixed by means of two irons attached to the legs of the table by thumbscrews, which allow of the board being taken away when a picture of too large a size has to be copied, when, by means of small wheels on those same two front legs, it is easily moved to a central position opposite a large board fixed to the wall. These boards are marked with a series of horizontal lines, and the height of the lens marked, at which diagonal lines mark the centre. By means of these lines I fix my picture square if it is a flat print, but when it is in a book I fix the book as near as possible to guess central; but sometimes that is impossible, as when a small picture is somewhere out of the centre of a large sheet, and then it is sometimes handy to be able to shift the camera to one side or the other of the stand, so that, in my opinion, the sliding fixture is in some cases a delusion and a snare, as it is perfectly easy to see that the camera is square on the stand. It is also handy to put it out of square when copying photographs which are slightly out of rectilinearity, as the distortion may then be overcome; but, if there is much distortion, it is useless to try to rectify it. When your picture is fixed, you slide the camera into position and focus; then, with a heavy camera, no further fixing is requisite; but, of course, you want to be gentle with it in putting in the slide, which shouldn't bite too tight in the rebates. It will be advisable to always clamp the camera if you are working near a thoroughfare where there is a lot of heavy traffic, as it is surprising what an amount of vibration you can get.

Now, as to fixing the picture to the board, if it is a flat print, all that has to be done is to fix it with drawing pins at the corners, not by sticking the pins through the paper, but at the side, so as to allow the head to hold the edge of the paper. Sometimes it is convenient to just catch the smallest possible edge, and then the pin should be put in slanting, the point away from the picture. In the case of an unmounted

print—albumen especially—this is frequently necessary, and also to have a large number of pins, as it is better to do without a cover glass if possible on account of reflections, but if you cannot keep the print flat by those means a cover glass must be resorted to; then put your black focussing cloth round the lens so as to cover all the bright metal and polished wood. This hint also applies to framed and glazed pictures. If the picture has been crumpled, it will greatly improve it to iron it, face down, with an ordinary flat iron, and then leave it in a somewhat damp place for a hour or so.

If the picture is in a book, I usually put two strings round as much of the book as is behind the picture and round the board, one at the top and one at the bottom, and draw them as tight as I safely can; then, if the leaves bulge unevenly, I put two thin, narrow strips of tough wood under the strings, which keeps them flat, and then, if the binding holds the lower end more forward than the top, I slip two wedges down, one each side, until the picture is upright. If the book is thin and of very large surface, so as to reach beyond the sides of my board, I have four strong laths, which I use instead of the string, and, with one at the back of the board and the other in front of the book, fix the two ends with strong rubber bands; in this case, as a rule, the binding is not in the way.

If the picture is on tracing or other semi-transparent paper, it will give a clearer and brighter negative if a piece of white paper is put at the back.

Now, as to exposure, it is not always advisable to take the well-meant tips which you have given gratis on this point, as, if you are copying black and white, you will be told that the shorter the exposure the stronger the contrast, and, when you say that the negatives still develop soft and flat, you are told to still halve the exposure. Now, my experience is that a black-and-white negative should develop with pyro and soda in from ten to fifteen minutes, according to temperature, and that, if they do not develop in that time, they will be flat through under-exposure; and also, that, if they develop much quicker, they will be flat from over-exposure; and it is a very difficult thing to judge by the resultant negatives whether they are under or over-exposed. Therefore, always time development, and judge by that. I also find that, with the plates I use, the maximum density, without choking the lines, is obtained in four times the time that it takes to get the whole outline just visible.

Here I should like to mention that there are degrees of black and white. Blacks may range from the pale blue-black with many rotten or half-covered places, or the faded, rusty black of old books to the intense black of modern engravings, and white range from the faded yellow of some old books, and the yellowish cream papers to the pure white of some of the new engravings. It is obvious that the same class of negative cannot be got from a rusty black on faded yellow as can be got from an intense black-and-white engraving; but it may surprise some that the very white-and-black print will stand more exposure than either of the others, and the rotten blue-black on cream the least of all. But it is from the fact that the intense black will take longer to reflect any appreciable amount of light than the faded ink, while the blue-black, being a more actinic colour and thin, will stand but very small amount of exposure, though, at the same time, the whites are in inverse ratio; therefore, taking exposure, the ink will stand as two to one, and the reflecting power of the whites as two to one, there will be a difference of four to one in the resultant negatives. That is an extreme case, but such can easily be found. In the case of the faded print, a clean but thin negative can be obtained, and is sufficient for some purposes, but for others must be intensified, while a rotten print will never copy well, as every thinness in the ink is exaggerated. So always expose for the longest time that the blacks will stand without developing up, and that is the point where you will get the strongest contrast; with less, the whites take so long to come up that the blacks fog; with more, the blacks will develop before the whites have gained sufficient density, and, as before mentioned, will both be flat.

In copying a photograph two or three times, the black-and-white exposure should usually be given according to the density of the photograph to be copied and the class of negative required. In extreme cases of flatness or a mere ghost of an image, the brightest effect will be obtained by exposing the same time as for a black-and-white, while very hard and solarised P.O.P. prints will want four times that exposure. I should always advise correcting errors as much as possible in exposure, as it is easier and more certain, and, in case of more being required, it can be done in development without much loss of time, whereas it, at best, can only be done with great waste of time in development alone. Another reason is, that, if you alter gradations in exposure, you can develop two very different negatives in the same dish, side by side, and get what you want. Don't get your negatives too dense, or your image will show all the marks of the paper copied. I find that a good time for developing photo-copy negatives is three times the time of the first appearance of the whole outline, in all usually six to ten minutes.

There are other methods of copying, as, when we want a negative from a negative, or lantern slides from the original negative, the only extra apparatus is for the front of the camera, and that may consist of condenser, artificial light, and holder for negative or transparency; or, for daylight, a multum-in-parvo class of apparatus, which is bulky, or a simple stand with grooved runners, which raise or lower at will by means of thumbscrews, which will hold any size from quarter-plate to 12 × 10, the intervening space being covered with a black focussing cloth; and, as it is inconvenient to work with the apparatus pointing to the sky; a reflector (white paper will do) is placed at the back at an angle to throw the most light into the lens; out of doors that will be 45°, but elsewhere other considerations come in and alter the angle. For making a negative from a negative, a transparency must be made; this can be done either by contact or in the camera. From a contact transparency the negative must be made in the camera, and from a camera-made transparency the negative may be made by contact, the best method being, perhaps, a contact carbon transparency, as that process gives a softness and range of gradation very difficult to equal by any other process, besides being cheap. It is a process that no amateur need be afraid of, and certainly no professional photographer ought to be without.

I am getting frightened at the length of this short paper, so will finally conclude by saying that I have never known a negative to fog by exposure to light after it is once put in the fixing bath, though some (so it seems to me) think that the slightest gleam of light on the last atom of visible bromide of silver has fogged it. I never knew light action to show (short of days' exposure) unless developed. H. C. Rapson.

WATKINS' DEVELOPING COMPETITION.

[Notes by J. Sterry.]

The conditions imposed—first, corresponding high lights to be equal in density; and, second, unexposed strips to show either no fog or equal fog—entailed considerable labour, and perhaps was one cause of there being so few competitors, and that only four out of seventeen could show decided change of gradation.

In ordinary work neither of the conditions would be binding, but whilst the second in the present case was necessary, because one object was to determine if any connexion existed between fog and varied gradation, the first was not so, and, moreover, prevented the full variation from being demonstrated. Thus, supposing that it was found that sixteen times as much exposure was required to be given with developer *A*, as with developer *B*, equal density should not be found upon any equal exposures, but where they varied as one to sixteen.

It may be said perhaps the results would be the same, but that is not so, because, in order to fulfil the conditions of equal densities at some one equal exposure only, it was necessary to develop so as to make the density curves cross at that point, instead of being parallel, and this unequal development told very unfavourably in all the prints. (If competitors had only been required to show a crossing point, and not necessarily make it the highest light, much trouble would have been saved, and several would not have been disqualified.)

An examination of the negatives gives far more information than can be obtained from the prints, because differences due to unequal development can be separated from those due to the composition of the developer.

But few of the plates are available for photometric measurement; only four competitors made use of exposures with definite ratios which could be compared, and two of these, 44 and 45, show but little variation.

Mr. Watkins having been good enough to send me the negatives, the measurements of 250 and 54 are given below, as they together show the effects obtained, from extreme under to extreme over-exposure.

Exposure	250 *A*			250 *B*			54 *A*			54 *B*		
Ratio.	Density	Diff.	Opacity Ratio	Density	Diff.	Opacity Ratio	Density	Diff.	Opacity Ratio	Density	Diff.	Opacity Ratio
1	·31			·08			1·02			2·15		
		·29	1·95		·02	1·05						
2	·60			·10			—	·43	2·69	—	·04	1·1
		·29	1·95		·06	1·15						
4	·89			·16			1·45			2·19		
		·29	1·95		·17	1·48						
8	1·18			·33			—	·38	2·40	—	·03	1·07
		·24	1·74		·27	1·86						
16	1·42			·60			1·83			2·22		
		·19	1·55		·39	2·45						
32	1·61			·99			—	·38	2·40	—	·05	1·12
		·08	1·20		·48	3·02						
64	1·69			1·47			2·21			2·27		
		·12	1·32		·52	3·31						
128	1·81			1·99			—			—		
	Correct Exposure 1 to 8. Over-exposure 8 to 128.			Under-exposed 1 to 32. Nearly correct 32 to 128.			Nearly correct throughout 1 to 64.			Greatly over-exposed throughout 1 to 64.		

Approximately the following differences in exposure would give the best results, although the prints do not indicate nearly so much.

249, 250, 251 and 6 ..... One to sixteen
246 ..... One to seven
54 ..... One to thirty-two.

230 being landscape, difficult to measure, but probably at least one to ten.

The most important point of all clearly brought out is, that the *best results are given by normal development.* This is well seen in 250 (as pointed out by Mr. Cowan), 250 *A*, having a long range of correct gradation, whilst 250 *B* has none at all, though coming somewhere near in the high densities. All the examples measured confirm this point also, and indicate that, when a plate will allow of a developer being used without bromide at all, the best possible results may be expected (see THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1894 p. 776, *Selective Developers*).

For both 54 and 6, only sufficient bromide (½ grain) was used, to secure compliance with the condition respecting equal fog, also that it might be shown that alteration in gradation is not dependent upon the use of a restrainer, yet it is seen from 250 that time is saved, by a large amount of bromide permitting the alkali to be increased.

Notwithstanding that the competition has not secured all that might have been expected, and can hardly be satisfactory to Mr. Watkins, it has not been altogether without use, in showing that definite alteration by varied development is not quite so easy, nor so useful, as generally supposed.

Will it be necessary to wait for another competition and prizes before anything more can be done? No light whatever has been thrown on tentative development.

THE KINEOPTICON.

MR. BERT ACRES, who, as our readers are aware, has recently demonstrated his kinetic lantern before several of the photographic societies, and may claim to have been first in the field with a public exhibition of animated photography on the screen, has given his system the happily chosen title of the Kineopticon, and is exhibiting it at a pleasant little hall in Piccadilly Circus, where we had an opportunity on Saturday last of witnessing the display.

The subjects on the programme included the arrest of a pickpocket, an exciting street scene; a carpenter's shop, showing work in full swing; a visit to the Zoo; a boxing match; the German Emperor reviewing his troops; the 1895 Derby; a rough sea at Dover; and other attractive views. The realism and success of the views, particularly in the case of the horse race and the breaking waves, are remarkable, and should ensure the kineopticon wide popularity.

THE AERIAL GRAPHOSCOPE.

ON the 18th inst. Mr. Eric Stuart Bruce gave a demonstration at the Kensington Town Hall of the capabilities of that ingenious piece of apparatus which he has christened the Aerial Graphoscope. This is familiar to many in London, since its effects were shown nightly a few years ago to visitors to the Photographic Exhibition at Pall Mall, and consists of a white lath revolving from its centre at a high rate of speed, upon which is thrown an image from an optical lantern. The result is that the picture appears as though in space.

At the demonstration, Mr. Bruce, in addition to showing pictures of statuary, &c., showed several experiments illustrating the scientific applications of his apparatus, the most interesting being, perhaps, the effect of casting a beam of light through a slit upon the screen. The beam being moved backwards and forwards formed a series of most curious forms. This experiment Mr. Bruce calls the hieroglyphic effect. The shadow of a falling ball and of a ring whirled at the end of a string were also shown.

As a modification of the apparatus, reflections of actual objects upon a revolving lath of looking-glass were shown. In his remarks Mr. Bruce pointed out the adaptability of the apparatus to the production of stage effects, especially those in which visions or spectral objects have to be made apparent to the audience, and also its value in most experiments dependent upon persistence of vision. The apparatus appears to be still in the experimental stage, and it will therefore not be reasonable to criticise the defects which exist in it at present, as they will, no doubt, be remedied before the apparatus is offered to the public. Messrs. Harvey & Peak, of 96, Charing Cross-road, are the manufacturers of the instrument.

NOTES FROM THE WEST OF SCOTLAND.

AT a meeting of professionals held on Monday last, final arrangements were made *re* the formation of the Glasgow Professional Photographic Society. The following gentlemen were elected office-bearers: *President*, Charles Turnbull, Esq. *Vice-Presidents*, George Bell and William Whyte. *Secretary*, J. M. Laing. The meetings of the Society will be held on Mondays weekly.

A very large turn out of members of the Greenock Camera Club took place on Thursday night on the occasion of Mr. T. N. Armstrong's lecture and demonstration on *Enlarging*, with and without the aid of condensers. Mr. Armstrong showed several new and simple methods of illuminating negatives by means of artificial light. These were the outcome of a series of experiments conducted by him during the late winter, and the meeting was highly pleased at the results obtained by the lecturer by the simple methods shown.

Steady progress is being made by the Corporation officials with the arrangements for the Campbell Exhibition, which is to be held during the summer months.

THE W. H. HARRISON FUND APPEAL.

	£	s.	d.
Contributions acknowledged last week	11	12	0
Britannia Works Co.	2	2	0
Alexander Cowan, Esq.	1	1	0
From a Friend	3	3	0
Lyonel Clark, Esq.	1	1	0
	£18	19	0

Further contributions will be thankfully acknowledged by

FREDE. H. VARLEY, 82, *Newington Green-road.*

Our Editorial Table.

CATALOGUES RECEIVED.

A NEW issue of his catalogue has been sent us by Mr. Wray, of North-hill, Highgate, W. The well-known lenses of the firm are referred to in detail, special prominence being given to the Platy-stigmat, a lens possessing, as we have already informed our readers, the properties of great flatness of field combined with freedom from astigmatism.

THE Birmingham Photographic Company, of Great Charles-street, Birmingham, send us their latest catalogue, which, in addition to particulars of their print-out and bromide papers, also contains prices and illustrations of many clever and useful items of photographic apparatus likely to attract the patronage of amateur photographers.

THE Autotype Company, of 74, New Oxford-street, W., forward us their March price-list of tissue and materials for carbon printing. Attention is specially directed to the fact that the Company now supply sample packets of tissues and transfer papers in three sizes (12×10, whole-plate and half-plate), and that the Daylight tissue is manufactured in ten colours, instead of four, as hitherto. Other additions are some fresh spotting colours, "R. R." single transfer (prepared on Rives paper), and matt-surface single transfer.

Ross & Co., 111, New Bond-street. Two handsomely got up and well-printed catalogues reach us from Messrs. Ross. No. 1 deals with a bewildering array of lenses, shutters, field cameras, stands, hand cameras, lanterns, arc lamps, jets, and amateur photographic requirements generally. No. 2 is devoted to microscopes, telescopes, field, marine, and opera glasses, surveying, drawing, and other philosophical instruments.

THE CRITERION PRINT-OUT PAPER.

THE Criterion print-out paper is the production of the Birmingham Photographic Company, from whom we have received a sample packet for trial. The paper prints quickly, gives good, even tones, and is evidently very carefully prepared. We append the instructions for working it:—

Wash prints for ten or fifteen minutes in several changes of water, and then immerse in alum bath (2 ounces alum to the pint of water) for about ten minutes, *well wash* in several changes of water, and tone in sulphocyanide toning bath, made as follows:—

Water	20 ounces.
Sulphocyanide of ammonium	40 grains.
Chloride of gold	3 ,,

The sulphocyanide may conveniently be made up in quantity as a stock solution, and the gold also in solution, 1 grain of the latter in each drachm of water. Then, just before commencing to wash the prints, mix in the proportions given above, allowing from 1 to 1½ grains of gold to each sheet of paper. It is best to mix the quantity required for the day's prints, using a fresh bath each time. This bath will give warm or black tones. For black tones, tone till, on examining by *transmitted* light, all the red has disappeared from the shadows.

After toning, well wash in several changes of water, and fix for ten minutes in hyposulphite of soda 3 ounces, water 20 ounces, fresh each time. *Wash* in running water, changing and draining frequently for one to two hours.

Photographic Surveying.

By E. Deville, Surveyor-General of Dominion Lands. Ottawa: The Government Printing Bureau.

In this work the author first deals with descriptive geometry, perspective, and perspective instruments, and then enters fully into the use of the camera for survey work. A chapter is devoted to Hurter & Driffield's investigations, and succeeding sections exhaustively discuss photographic operations, field work, plotting the survey and photographs on inclined plates. The author writes in praise of the anastigmatic lenses for survey work. Nearly 300 illustrations and diagrams are given, and the book is one calculated to be of extrem value as a guide to survey work by means of photography.

News and Notes.

Ipswich Y.M.C.A.—A Camera Club has been formed in connexion with the above. The officers are as follows:—*President:* Mr. Josiah Runels.—*Vice-President:* Mr. Evan Edwards.—*Committee:* Messrs. Bennett, Douthwaite, Hill, Hutchinson, and Southgate.—*Hon. Treasurer:* Mr. B. C. Ridley.—*Hon. Secretaries:* Messrs. F. H. Smith and E. H. Collar.

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, April 1. Mr. E. J. Wall will discourse upon *The Composition of the Negative Image and its Relation to Speed Readings and Printing Qualities.* Visitors will be welcomed by the members.

Mr. Wilfred Emery, of 3, Soho-street, Soho-square, W. (two doors from Oxford-street), writes: "I herewith enclose a notice of my removal from South-street to new offices and showrooms at 3, Soho-street. Owing to the rapid increase in my business, I considered it advisable to do so, as my new offices are in the centre of the wholesale photographic trade, and therefore more easily reached by my customers."

Gospel Oak Photographic Society.—On March 17 this Society held its General Meeting, Mr. G. A. Powell in the chair, and the following officers were elected for the ensuing year:—*President:* Rev. H. LePla.—*Vice-President:* Mr. F. H. Hall.—*Committee:* Messrs. W. Beyer, J. Gittens, J. Hingston, J. Pridham, and C. Stone.—*Treasurer:* Mr. W. H. Rollason.—*Hon. Secretary:* Mr. W. A. Palmer, 13, Dale road, Kentish Town.—*Assistant Hon. Secretary:* Mr. H. Billingsley.

The Hackney Photographic Society's Third Annual Dinner was held at the Grasshopper Hotel, Gracechurch-street, on Tuesday, March 17, Mr. E. J. Wall (the President of the Society) being in the chair. About sixty members and friends were present, including Mr. T. Fall, Mr. Debenham, Mr. Bedding, Mr. J. A. Sinclair, Mr. Welford, Mr. Oakden, Mr. Mackie. The toast of the Society was given by Mr. J. A. Sinclair, and other toasts were: "The Officers" (in reply to which the Hon. Secretary, Mr. W. F. Fenton-Jones, indicated that the Society was in a most prosperous position), "The Press," and "The President." Music, recitations, and a diverting ventriloquial entertainment contributed to the success of a very pleasant evening.

Royal Institution.—The following are the lecture arrangements after Easter:—Professor James Sully, of University College, London, three lectures on *Child-study and Education;* Mr. C. Vernon Boys, three lectures on *Ripples in Air and on Water;* Professor T. G. Bonney, two lectures on *The Building and Sculpture of Western Europe* (the Tyndall Lectures); Professor Dewar, three lectures on *Recent Chemical Progress;* Mr. W. Gowland, three lectures on *The Art of Working Metals in Japan;* Dr. Robert Munro, two lectures on *Lake Dwellings;* Professor W. B. Richmond, R.A., three lectures on *The Vault of the Sixtine Chapel;* Mr. F. Corder (Curator of the Royal Academy of Music), three lectures on *Three Emotional Composers—Berlioz, Wagner, Liszt* (with musical illustrations); Mr. E. A. Wallis Budge, of the British Museum, two lectures on *The Moral and Religious Literature of Ancient Egypt.* The Friday evening meetings will be resumed on April 17, when a discourse will be given by M. G. Lippmann on *Colour Photography.* Succeeding discourses will probably be given by Professor G. V. Poore, Colonel H. Watkin, C.B., Professor Silvanus P. Thompson, Professor J. A. Ewing, Professor J. A. Fleming, and other gentlemen.

Croydon Camera Club.—Sixth Annual Dinner.—The above was held in the large dining-hall of the Greyhound Hotel on Wednesday, the 18th inst., when a full gathering of members assembled under the chairmanship of Mr. Hector Maclean (the President of the Club), who was supported by Mr. F. A. Oldaker (chairman of the Surrey Art Circle), Mr. Thomas Bedding (editor of The British Journal of Photography), Mr. Walter D. Welford (editor of the *Photographic Review*), and other gentlemen of photographic standing. The toast of the evening, "The Croydon Camera Club," was proposed by Mr. Bedding, and acknowedged by the President, who, in the course of his reply, which touched upon a large number of topics, read a letter from his Worship, the Mayor of Croydon, in which the latter signified his pleasure to preside at the forthcoming lantern show, on the Wednesday following, an announcement which was hailed with loud cheers. "The President" was proposed by Mr. James Packham in eloquent terms, which were duly endorsed by vociferous musical honours. Other toasts were "The Visitors," coupled with the names of Messrs. Wreford and Walter D. Welford, the latter of whom made a lively and humorous reply; "The Secretaries and Executive" (Messrs. Frost, Burn, and Holland); "The Photographic Press;" "The Stewards" (who were Messrs. Waller, Frost, Hurst, and Wreford); finally "The Ladies," who were in charge of Messrs. Hurst and S. H. Wratten. The musical programme was unusually full and attractive. Mr. Claude Packham's violin solos were vastly appreciated, as also were the effectively delivered ballads of Mr. Keough, and the declamatory rendering of "The Execution of Montrose" by Mr. Thornton. Mr. Walter D. Welford's selections upon a one-stringed Japanese fiddle gave much pleasure, and created considerable wondermert at the range of sound emitted. There was also plenty of fun in "Up came Johnny with his Camera" (Mr. Frost), and in the vocal comicalities of Messrs. Bown and Burns, jun. Others who contributed various items to the entertainment programme were Mr. H. E. Holland, Mr. J. Burn, Mr. A. Jenkins, Mr. S. H. Wratten, and Mr. A. E. Isaac.

Patent News.

The following applications for Patents were made between March 11 and March 18, 1896:—

Shutters.—No. 5340. "Improvements in Shutters for Photographic Cameras." E. S. B. Hughes.

Cameras.—"No. 5454. "Improvements in Parts of Photographic Cameras." J. B. Brooks.

Printing.—No. 5494. "A Material for Photographically Printing upon both its Surfaces." H. Maclean.

Artificial Light.—No. 5637. "Improvements in Means for Illuminating Objects for Photographic and other purposes." Complete Specification. Y. Schwartz.

Mounts.—No. 5695. "An Improved Picture Mount for Photographic and other Albums and the like, applicable also for Binding Loose Papers or Sheets and Samples." M. G. Amson.

Photographic Apparatus.—No. 5699. "An Improvement in Photographic Apparatus." B. Acres.

Chrono-photographic Apparatus.—No. 5758. "Improvements in Chrono-photographic Apparatus." F. Gossart.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
30	Leeds Photo. Society	*Some Account of the Photographic Convention of 1895.* J. H. Walker.
30	North Middlesex	Informal Meeting.
30	Richmond	*Platinotype.* T. H. Stringer.
31	Bournemouth	Discussion on Exposure and Exposure Meters.
31	Brixton and Clapham	*On Making Enlarged Negatives.* M. Atkinson.
31	Hackney	Members' Auction.
31	North Surrey	Prize Slides.
April.		
1	Croydon Camera Club	Second Novices' Night: *How to Make a Good Negative.*
1	Derby	*Notes on Landscapes.* F. L. Pither.
1	Edinburgh Photo. Society	W. Ivison Macadam, F.R.S.E., F.I.C., F.C.S., &c.
1	Photographic Club	*The Composition of the Negative Image and its Relation to Speed-readings and Printing Qualities.* E. J. Wall.
2	Bradford	*Hints on Portraiture.* A. Priestley.
2	Ealing	Lantern Evening.
2	Liverpool Amateur	Lantern in Use.
3	Croydon Camera Club	Excursion: Amberley for Bury and Fittleworth. Leader, J. Smith.

ROYAL PHOTOGRAPHIC SOCIETY.

March 24,—Technical Meeting,—The Earl of Crawford, K.T. (Vice-President), in the chair.

Mr. S. Herbert Fry showed a model of McKellen's hand camera, with a new device for changing plates.

Mr. F. E. Ives read a paper on the relative colour sensitiveness of

Ordinary and Isochromatic Plates.

He said many writers had from time to time asserted that isochromatic effects could be obtained by exposing ordinary plates through yellow colour filters, but most of such writers—like others who claimed that orthochromatic results could be obtained in daylight with commercial orthochromatic plates without a colour filter—did not know what they were talking about. Nevertheless, inasmuch as it was true that, with suitable colour filters, orthochromatic effects could be obtained with extremely rapid ordinary gelatino-bromide plates, it was reasonable to suppose that some of these workers might have proved the fact before they made the assertion. He believed, however, that the first practical demonstration of the possibility of not only obtaining orthochromatic effects with ordinary plates, but of perfectly controlling the relative action of the different spectrum rays so as to render all the colours in photometrically accurate relation to each other, was made by himself, in Philadelphia, in 1886, in which year he showed at the Franklin Institute a reproduction of a high-class chromo-lithograph, the colours of which were more accurately rendered on an ordinary plate than in a photograph of the same subject made by Dr. Vogel to prove the capabilities of his

then secret azaline process. Having referred to various publications in which his communications upon the subject had appeared, he proposed to confine himself principally to an exhibition and explanation of the results of various experimental tests, any half-dozen of which he was prepared to repeat at the conclusion of his paper. His test object consisted of six squares of glass—white, cobalt blue, signal green, chromium green, pot yellow reinforced with brilliant yellow dye, and ruby red—over which he had placed a film photograph of a geometrical pattern with shaded lines, which helped to make evident to the eye the relative amount of action in the different squares in the reproductions. Four photographs of the test plate were shown, two on isochromatic plates with a screen of a very good medium pot yellow glass, the third on an ordinary plate with Dr. Vogel's aurantia colour filter, and the fourth on an ordinary plate through a very light colour filter of naphthol yellow and multiple yellow, the last-mentioned yielding an almost perfect result. A series of slides was next shown, for the purpose of demonstrating the distribution of colour sensitiveness, and the relation of green, yellow, and red sensitiveness to blue sensitiveness in the various commercial orthochromatic plates; the effect of exposure on an ordinary plate without a colour filter, through medium and deep chrysoidine and deep cobalt blue; and the effect of exposure of an isochromatic plate through a combination of brilliant yellow and medium fuchsine, and of a variety of plates through a combination of naphthol yellow and multiple yellow. Further slides appeared to show that it would be possible to obtain orthochromatic photographs on ordinary plates with exposures not more than two or three times longer than was necessary with one make of commercial orthochromatic plates, and six and a half times longer than with another highly praised orthochromatic plate, but that 160 times longer was required than with certain green sensitive plates; these figures, however, were modified by varying conditions. The next slides were intended to show the uselessness of yellow glasses, and aurine, multiple yellow, and chrysoidine colour filters with ordinary plates. Aurine, although represented in Dr. Eder's *Handbook* as completely absorbing the blue end of the spectrum, was worse than no screen at all, since it only served to reduce the action in the green; multiple yellow was equally useless; deep chrysoidine (chrysoidine being also represented in Dr. Eder's *Handbook* as completely absorbing the blue end of the spectrum), and chromium green, were also unsatisfactory. Although certain special colour filters gave better results with ordinary plates than did yellow glasses with some well-known orthochromatic plates, it should be clearly understood that with suitable colour filters equally good results could be obtained on orthochromatic plates, with shorter exposures. Some manufacturers of orthochromatic plates did not recommend yellow glasses, but supplied very good dyed colour filters; but Mr. Ives said he did not know of any such manufacturer who had admitted that it was not necessary to employ specially colour-sensitised plates in order to obtain orthochromatic photographs.

Mr. W. E. Debenham asked what was meant by "multiple yellow" and "brilliant yellow?"

Mr. Ives said he did not know himself. He obtained the dyes under those names from chemists in New York and Philadelphia, but no one seemed to know what they were.

Mr. Debenham remarked that, from one of the results shown, it would appear that a chromium green light would be the best by which to develop isochromatic plates; and

Mr. Ives said that was undoubtedly the case.

The Hon. Secretary (Mr. Chapman Jones) asked whether Mr. Ives got the maximum of action in the yellow by daylight without a screen?

Mr. Ives replied that it was only with special screens that there was the maximum in the yellow, even with electric light.

Mr. E. J. Wall, referring to Mr. Ives's statement that he differed from Dr. Eder as to the effect of aurine, asked what aurine Mr. Ives used? Aurine was extremely sensitive to light, and faded very rapidly, which might account for the difference. He had himself experimented both with aurine and chrysoidine, and his results agreed exactly with those of Dr. Eder. He fancied that multiple yellow and brilliant yellow were mentioned in Benedict's *Chemistry of the Coal-tar Colours*.

Mr. Ives said he obtained three samples of aurine, and used the yellowest. In answer to Mr. Bolas, he expressed the opinion that an exposure of from two to four times that required with an orthochromatic plate would, with an ordinary plate and a suitable screen, yield a fairly satisfactory result.

Mr. Wall asked whether it was possible to obtain an orthochromatic effect on an ordinary plate without a screen?

Mr. Ives said he knew of no means by which it could be done.

Mr. Hearson pointed out that it was impossible to follow up Mr. Ives's investigations if the dyes to which he had referred were not obtainable.

Mr. Ives promised to give some information respecting the dyes in an appendix to his paper when it appeared in the Society's *Journal*.

Mr. T. R. Dallmeyer expressed a hope that Mr. Ives would give some attention to the subject of dying balsams for use as colour filters.

The Hon. Secretary suggested that, in further experiments, the direct-vision spectroscope should not be used; the use of this instrument would probably account for differences of observation between Mr. Ives and Mr. Wall.

Mr. Wall said he obtained precisely the same results with the direct-vision spectroscope as Dr. Eder got with two prisms.

Mr. Ives made some further remarks upon the use of chlorophyll and the bichromate tank, and showed a photograph of a painting copied by this process, and the meeting closed with the passing to him of a cordial vote of thanks for his paper.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

March 19,—Mr. J. J. Brigginshaw in the chair.

The following presents were laid on the table: The British Journal Photographic Almanac for 1896 and *Photographic Surveying*, by E. Deville.

Mr. W. H. Smith was proposed for membership.

Mr. Freshwater showed two more shadowgraphs, one of a child's foot, with a deformed ankle, and one of his own foot.

The Traill Taylor Memorial Fund.

The Hon. Secretary made a statement as to the present position of this fund, and drew attention to a letter of Mr. Drage in the photographic press with reference to a proposal that the Photographic Convention should support the same. He hoped to see a much larger sum collected than at present to hand, and thought no effort should be spared until at least 350*l.* was obtained. When it was remembered that Mr. Traill Taylor had always been willing to give them information and aid in the way of lectures, he considered the members should feel it their duty, and that they owed it to his memory, to see that the fund did not lack support, and he proposed therefore that a subscription list should be started amongst those members who had not already subscribed.

Mr. A. E. Smith said it had been asked whether it was worth while to turn a portrait lens round for enlarging. He had found it a great advantage, and showed photographs demonstrating this, the image being sharper on reversing the lens.

Copying.

Mr. H. C. Rapson read a paper on this subject. [See page 200.]

The Hon. Secretary had been much interested in the paper, especially with reference to the method of avoiding vibration. He had seen an arrangement adopted by Mr. Smith, whose business premises were over a lot of machinery, and on the top floor and from the rafters he suspended a cradle by four stout ropes, which carried all the apparatus for copying, and he thought it a grand idea. With reference to the superiority of the new lenses for copying purposes, it was true there was freedom from astigmatism, but one was not bound to use a wide angle. He considered the old form of rectilinear gave as good results, if not better, and thought it was a moot question whether some of the newer forms were superior in point of copying. With a moderate angle, he believed it probable that an older lens would yield better results than the recent forms.

Mr. Smith had found the new lenses no worse than the old. He said the cradle he used took off quite ninety per cent. of the vibration.

Mr. Rapson, in reply to some questions, said he had given up the rectilinear lens in favour of the new Goerz, which he found much superior. That he previously used was a very good French rectilinear lens of twelve inch focus. In reducing very much, say, from eighteen inches high to three inches high, he could not get perfect definition with a larger stop than *f*-22, while with the Goerz he could get perfect definition over a half-plate with full aperture, *f*-7·7.

Mr. A. Mackie said a long exposure to weak light was not the same as a short one to a brilliant light, and for that reason the newer lenses, which enabled a shorter exposure to be given, would be advantageous, other things being equal.

Mr. Rapson, questioned by Mr. Mackie, did not like isochromatic plates for copying. He had found a difficulty in keeping them absolutely clean.

Mr. Mackie had, on the contrary, found them very clean. In copying old silver prints he would like to know the way Mr. Rapson preferred to light it. The difficulty was to get rid of the grain.

The Chairman had also experienced difficulty in the matter of grain and reflection. He thought the best way was to place the print a little to one side of a window.

Mr. Rapson's studio was all glass, and he had a flood of light on all sides, which he reflected from the floor by a piece of white paper.

Mr. Mackie preferred a very oblique source of light. With unmounted silver prints he had found it a good way to wet and mount the print on glass, backing up with blotting-paper. When the prints were stamped on the back, however, unless they were first removed, these would show through, and he got rid of them with a little sulphite of soda.

Mr. Atkins said soap and water would also remove them.

Mr. Haddon stated that, in the event of prints so mounted being allowed to dry, they could be removed with a mixture of a drachm of hydrofluoric acid in three or four ounces of water without damage.

Mr. Teape had found it best to place the print between two sources of light rather than using one only.

The Hon. Secretary said he would be interested to hear of some experiences with uncorrected lenses for copying. The thinness of the glass would probably be an advantage.

Mr. Mackie said if sufficient brains were used with the lens, no doubt an uncorrected one would answer.

Mr. Rapson thought the advantages would not be sufficient to compensate for the stopping down. For regularity of result he emphasised the timing of development, which was an enormous power. For copying photographs, he had found three times the period between the commencement of development and the appearance of the image as sufficient.

PHOTOGRAPHIC CLUB.

March 18,—Mr. Crofton in the chair.

The Hon. Secretary announced a series of lectures upon the chromium salts, which would be held at the rooms of the Royal Photographic Society on Friday evenings, commencing in Easter week.

Mr. Snowden Ward proceeded to deliver his lecture on the

New Photography.

Mr. Ward, who was assisted by Mr. Robins, had a good array of the apparatus necessary for his demonstration. His intensity coil was made by Hurst & Co., of London, and is capable of giving a six-inch spark, although he (Mr. Ward) does not work at so high a tension. Secondary batteries are used as the source of current, on account of the facility with which they can be recharged in most large towns. A supply of both old and new patterns of radiant matter tubes, supplemented with Newton's latest device, the "focus" tube, and some of the more toy-like electrical apparatus of the Geissler tube order, were on the table before him. Mr. Ward, in a few well-chosen fore-

words, said his lecture would be partly of the elementary and partly of the advanced type—elementary for such as wanted to see the phenomena which produced the new results, advanced for those who desired to be acquainted not only with the latest work done, but with the side issues and workings of our own and Continental scientific men. Mr. Ward said that many of the most recent discoveries were but the exhumation of a previous burial, and that many of the phenomena now noted had been already discovered and discarded. He mentioned that, many years since, Sir Benjamin Richardson had been able to note the structure of the skeleton of a young thin person when illuminated by burning magnesium. Röntgen's discovery was based upon the work of Crookes, Hittorf, Lenard, Tesla, and others, who found that the high-tension current in an almost closed circuit passes the gap between the terminals in sparks; but that, if this gap be enclosed in a vacuum, the nature of the discharge entirely changes, and becomes a fluorescent glow, which depends for its colour upon the nature of the residual gases and the chemical constitution of the glass tube which surrounds the vacuum. As the vacuum becomes complete, the glow in the tube practically ceases, and the glass itself becomes fluorescent. Hittorf and Crookes very thoroughly examined this phenomenon, and the latter founded his theory of radiant matter thereupon. Other investigators found that the rays of which this glow appears the outward and visible sign possess the potentiality of passing through substances which are ordinarily regarded as opaque. Röntgen has practically demonstrated this, and given the fact prominence. Like many other discoveries, this one was accidental, but all credit is due to Professor Röntgen for completing the series of observations in the character and properties of the X rays. The most practical portion of Mr. Ward's remarks were, perhaps, contained in his suggestion that, if a worker were content to use the older form of tube, requiring an exposure of five to ten minutes, very reliable results could be expected to ensue.

Mr. Robins then made a radiograph of a pair of pince-nez in a wooden case, and the developed negative was shown upon the lantern screen.

Mr. Frank Haes asked the Club to express their gratitude to Mr. Ward for all the time and trouble which he had expended, and for the most interesting lecture; and the Club did so, and evinced their interest in the matter by an interesting discussion of a somewhat discursive character, in which Messrs. Cowan, Child Bayley, Fry, Bridge, and others took part.

Questions were asked as to the preferential suitability of fast or slow plate films and paper for purposes of radiography, the cost of apparatus, the effect of an extra-thick or thin coating of emulsion; but the lecturer said that at present there was nothing like unanimity of opinion amongst workers, and that, as a matter of fact, the action of the "tubes" was so irregular that the time for determining these other and more photographic details had hardly arrived.

Mr. Ward mentioned that a radiograph had been made through a packet containing a dozen sheets of bromide paper upon a dry plate, and that an equally good image had been obtained upon all the sheets of paper and upon the plate underneath.

MANCHESTER PHOTOGRAPHIC SOCIETY.

March 12,—Mr. F. W. Andrew in the chair.

The following gentlemen were elected members:—Messrs. T. M. Brooke, F. W. Burton, J. Evans, J. H. Holland, S. H. Tiller.

Mr. F. W. Mastera exhibited a most ingenious stereoscopic hand camera of his own manufacture, embodying many good features, including a rising front with finder attached, the mirror being an inclined plane rising or falling as the front is raised or lowered.

Mr. H. V. Lawes showed some excellent specimens of objects impressed on the sensitive plate by means of the X rays, the work of Mr. Dorman.

Mr. A. Brothers, F.R.A.S., then gave an outline of a method of

PHOTOGRAPHING THE CORONA WITHOUT AN ECLIPSE,

and illustrated his remarks by lantern slides. In 1860 an expedition was sent to Spain in order to find whether the red flames were of the sun or moon, and, by photographs and drawings taken while the moon passed in front of the sun's disc, it was found that they were of the sun. Slides were then passed through the lantern of the sun's flames taken without an eclipse by Mr. Packer, of Birmingham, by means of a pinhole camera and a very thin sheet of copper, lead, or aluminium placed in front of the plate, the results being very remarkable.

There were next shown on the screen several examples of the New Photography, lent by Mr. J. T. Chapman, and described by Mr. Brothers.

Brixton and Clapham Camera Club.—March 17, Mr. J. W. Coade (President) in the chair.—Mr. W. Biddell gave a lantern lecture,

THE MONASTERIES OF ESSEX.

It was soon evident that Mr. Biddell is both an enthusiast and an authority on the antiquities of this country, and has also the gift of interesting his audience, and of conveying to them a vast amount of information in a pleasant manner. In addition to well-known abbeys and priories, as Barking, St. Osyth's, Coggeshall, Stratford Langthorne, Waltham, Beeleigh, &c., he has made it his business to search out all possible traces of many less familiar monastic houses, the remains of which have, in many instances, been used for farm buildings or have entirely disappeared. Besides recent photographs of existent ruins, Mr. Biddell shows a number of slides copied from old prints and engravings, thus enhancing the value and completeness of his series, which well deserved the attention they received from the audience. The Society have decided to hold quarterly competitions open to all members. The closing date for the first is June 16, and the subject landscape. A bronze medal and certificates will be awarded. It is also proposed to hold an exhibition of members' work in October next.

Camera Club.—Those of our readers who attended the last meeting of the Photographic Convention at Shrewsbury will remember a large frame containing a number of prints, direct and enlarged, treated in various ways on one sheet of bromide paper. It was the work of Mr. Luboshez, who was present at the Shrewsbury Exhibition to represent the Eastman Company. This gentleman gave an interesting discourse on portraiture at the Camera Club last Monday week, and, as a demonstration of the

ELECTRICAL APPARATUS MADE BY MESSRS. NALDER & HARRISON

for studio work was arranged for the same evening, the speaker and the exhibitors joined forces in a very happy manner, and, while several exposures were made under the reflected beams of the electric light, Mr. Luboshez was able to talk of posing, the various ways of lighting a model, and to demonstrate his method of developing the resulting negatives. The lesson was a valuable one to those who practise portraiture, as well as to those who are thinking of doing so; hence there was a good attendance of members. The Nalder & Harrison apparatus worked well. It consists of a hand-fed electric arc lamp, the two carbons being set in holes pierced in the sides of a cup of white marble or other refractory material, which becomes heated sufficiently to add its quota of softened light to the total luminosity produced. This cup is set in the focus of an umbrella-like reflector, and prevents the direct light from the white hot carbons from reaching the sitter. After several portraits had been taken of Lord Crawford and others, the lecturer proceeded to develop the plate. He agreed with all other workers that little or nothing can help out an under-exposed negative, it is a waste product, for which no use can be found; but he asserted that an over-exposed plate could be turned into a good negative provided that it had not received more than 100 times the normal amount of exposure. Acting on the presumption that a plate was much overdone in the matter of light access, he would proceed to develop it in the most tentative manner, using a very much diluted agent—be it pyro, metol, or anything else—until the image appeared. He could now tell, by its behaviour, how to proceed. If it showed signs of over-exposure, it was immediately placed in a one per cent. solution of bromide, and allowed to remain soaking therein for about five minutes. The development of the plate is then proceeded with warily, and, should there be a threatened want of density, the developer alone—*i.e.*, without accelerator or retarder—is applied to the plate until the required result is brought about. If this method be carefully followed, any amount of density can be obtained on a plate which otherwise, in consequence of over-exposure, would be thin, flat, and in every way unprofitable. Several excellent Röntgen pictures of hands, feet, &c., have recently been taken at the Club under the able manipulation of Mr. Powles, of the Electrical Standardising Institute, Faraday House.

Croydon Microscopical and Natural History Society (Photographic Section).—March 20.—A numerous and appreciative audience assembled at the School of Art room, Public Hall, to witness the final lantern exhibition of the season. The first part of the programme was devoted to members' slides. Mr. A. Roods contributed an excellent series of views of Hartfield, Groombridge Place, Lingfield, Oxted, Godstone, and Lewes. Mr. Alfred Underhill followed with a collection of photographs of Croydon, Beddington; snap-shot street scenes, views of the Tower Bridge and river Thames; also pictures of Guildford, Dorking, and Ramsgate. Mr. Hoole, of Sutton, showed a number of fine slides of the Norfolk Broads, &c., which were deservedly admired. The second part consisted of a short paper by Mr. J. H. Baldock, F.C.S., on Professor Röntgen's X rays, illustrated by diagrams made by himself and slides kindly lent for the occasion by Mr. Campbell Swinton.

Dulwich Photographic Society.—March 17.—The Committee having accepted, with great regret, the resignation of Mr. E. Beer, the Hon. Secretary owing to pressure of business, Mr. Herbert J. Ellis, one of the founders, was unanimously elected to fill that post pro tem. Two new members were elected and three more proposed (among the latter a photographic chemist), the members proceeded to the last Exhibition this season of their lantern slides, to which a large number of visitors were admitted. A new member (Mr. Mitchell) was applauded for a pretty scene from Ladywell Recreation-ground, one of Windsor Castle, and also a pleasing slide of Eynsford. Mr. Beer's slides of Kingsgate Castle, Broadstairs Pier, and Ramsgate Harbour were much praised, as were Mr. G. E. Smith's views of Hastings Castle. Mr. H. Jackson's views of Old Champion Hill Station (now East Dulwich), Lock House, Sunbury and Marlow Church were most effective, also the slides of Mr. Herbert J. Ellis, who exhibited portraits of different members and views of river scenes, &c. The Society would be pleased to hear from those wishing to become members. Address Herbert J. Ellis, Constitutional Club, East Dulwich-grove, S.E.

North Middlesex Photographic Society.—March 16.—Mr. H. Stuart gave a paper on

ENLARGED PAPER NEGATIVES.

He told how paper negatives were made long before glass plates were in use; but, whereas the exposures for landscapes then necessary ran into hours, it was very different now. He used mostly Ilford smooth slow bromide paper for the enlarged negatives, placed in the dark slide of an enlarging camera, the paper backed up by cardboard or glass to keep it flat. The paper print to be enlarged from was fixed on a sliding screen in front of the camera, with a piece of glass superimposed to keep it in position. This was exposed to daylight for about ten minutes in summer to an hour or more in winter, according to the light. It could be developed as an ordinary bromide print, but carried further, and could be intensified if necessary. He showed numerous negatives and prints therefrom in carbon, bromide, and silver, some from waxed negatives, and others from unwaxed. The carbon process seemed best suited to the negatives, as the slight grain was less apparent than with the other processes. The paper provoked some discussion as to the advisability or otherwise of waxing, except in the case when quickness of printing was necessary, and various mediums were recommended.

Putney Photographic Society.—March 18, Dr. Cuthbert Wyman presided.—The Chairman remarked that the lantern-slide competition which should have taken place that evening had been unavoidably postponed to April 29, on which occasion Col. Gale, F.R.P.S., has kindly consented to act as Judge. The subject of the evening being "lantern-slide making," Mr. W. C. Plank pro-

ceeded to explain the whole process, and described the necessary apparatus for making slides by contact and reduction, after which Mr. Wm. Martin (Hon. Secretary) exposed and developed some lantern plates which were then passed through the lantern, and slides by Messrs. Colebrook and Staunton were also shown. Mr. F. T. Beeson gave some useful hints on this subject during the discussion that followed.

Richmond Camera Club.—On Monday, the 16th inst., the Richmond Camera Club gave an exhibition of lantern slides before the Richmond Athenæum, an old-established local institution. The evening, which was further enlivened by recitations and music, passed off very successfully. The programme of the photographic portion of the entertainment was as follows: 1. Some French cities and Ceylon, twenty-four slides by Mr. J. D. Gibson. 2. Local views, six slides by Mr. F. Neville. 3. Seaside views, eight slides by Mr. P. Ennis. 4. English scenery, seventeen slides by Mr. G. Ardaseer. 5. Pompeii, twenty-four slides by Mr. C. H. Davis. 6. Miscellaneous, six slides by Mr. H. A. Dimsdale, eight slides by Mr. R. Skone-James, and twelve slides by Mr. J. H. Williams. 7. The Land of the Broads, fifteen slides by Mr. C. J. M. Child. 8. Richmond (Yorks), eighteen slides by Mr. J. B. Hilditch. 9. Spanish scenes, twelve slides by Mr. E. D. Purcell. 10. Granada and the Alhambra, twenty-four slides by Mr. F. P. Cembrano, junr.

Bradford Photographic Society.—March 19.—Mr. CECIL WRAY, A.M.E.E., gave a popular lecture, entitled

PHONOGRAPHS, KINETOSCOPES, AND THE KINETOGRAPH.

Mr. Wray divided his lecture into two parts, the first being devoted to the rapid advancement of these inventions, and a clear explanation of the different apparatus. The second part was devoted to the practical demonstration of the commercial Edison-Bell phonograph as used in lieu of a short-hand clerk. Musical records, songs, whistling solos, and recitations were rendered, and a recitation by one of the members present was taken into the phonograph and repeated by the instrument, to the amusement of all present. At the close a hearty vote of thanks was accorded to Mr. Wray for his very instructive and entertaining lecture, which he briefly acknowledged, and promised as soon as he had completed a kinetograph, which he had in course of construction, he would be pleased to give a demonstration with it before the Society, thus enabling a roomful of people to see on a lantern screen moving pictures, the same as those in the kinetoscope, but on a larger scale.

Derby Photographic Society.—March 17, Mr. A. B. Hamilton in the chair.—Mr. HAROLD BAKER, of Birmingham, gave a lantern lecture on the

AVON VALLEY,

and the lecture was illustrated by considerably over 100 slides of a very high order of merit. Mr. Baker dealt in a very interesting manner with the natural and archæological features of the district, the views of the river scenes, the church interiors, and the old monuments shown on the screen being deservedly appreciated. The concluding meeting of the winter session will be held on April 1, when a paper by Mr. F. L. Pither, entitled *Notes on Landscapes*, will be read.

Liverpool Amateur Photographic Association.—A lecture was delivered by Mr. EADWEARD MUYBRIDGE in the City Hall, Eberle-street, on the 19th inst., in connexion with the above Association. The subject of the lecture was

THE MOTION OF THE HORSE AND OTHER ANIMALS IN NATURE AND IN ART.

Mr. Muybridge described in detail the various movements which make up the canter, trot, gallop, and other movements of the horse, and illustrated his remarks by an admirable series of photographs exhibited by the oxyhydrogen light.

Moseley and District Photographic Society.—March 20, Captain Davidson (Vice-President) in the chair.—Mr Adams was enrolled as a member. The Hon. Secretary passed round for inspection a print showing spotty markings all over, and asked for suggestions as to the cause. Several likely causes were suggested, and amongst them "the influence of unevenly mixed emulsion on the P.O.P." The SECRETARY then stated that all were wrong, and it was caused by the negative (a thin one) during printing having raindrops on the glass of the printing frame. Captain DAVIDSON suggested they had been had on toast. Dr. RADCLIFFE then delivered his excellent lecture on

HOME PORTRAITURE.

He remarked that, no doubt, the amateur would be tempted at some time or other to take portraits of his friends and relations, and it was quite possible and even probable by so doing to make them enemies for life. Different to the landscape, &c., the subject and lighting was quite under control of the operator, if he had a few accessories for regulating the light. He gave diagrams for lighting the room of one and two windows, and stating the best single window was that known as a bay window. He suggested that a graduated background would often be very advantageous in many cases, bringing into greater prominence the lighting on the face. What made him take more to portraiture than other branches of the art was the fact that he had early learned the art of retouching—not excessive retouching as practised by professionals, but just evening up of the irregularities caused by the different actinic colours of the flesh and photographic exaggerations. Many and useful were the hints given, and highly were they appreciated by the members present. The HON. SECRETARY then made a few remarks respecting various points that had been raised, and made a few further suggestions which he thought might be useful to the beginner or home portraitist. Mr. WILLIAMS then said that he thought it quite unnecessary to make comments on what the lecturer had said, and thought it very presumptuous of the Hon. Secretary to take upon himself the criticism and discussion of the paper Dr. Radcliffe had so kindly given. The HON. SECRETARY then called attention to a by-law which asked for comment, criticism, and discussion, and stated that he thought the greatest benefit to a Society would accrue from free and unrestrained criticism. He was sorry if he had not paid sufficient deference to the lecturer, for he felt that the greatest praise was due to the lecturer, Dr. Radcliffe, for his very excellent and instructive lecture, and proposed as a vote of thanks that the lecturer take the fullest and most sincere thanks of an interested and instructive meeting. Mr. WILLIAMS seconded.

Glasgow and West of Scotland Amateur Photographic Association.—March 16.—Mr. STEWART SMITH lectured on

THE RÖNTGEN RAYS AND HOW TO USE THEM.

He pointed out what Professor Röntgen had discovered, and indicated some of the probable applications of the rays. After describing some of the more remarkable phenomena which have been observed, he showed Crookes' and other forms of vacuum tubes in action, and explained the method of making exposures. At the conclusion of Mr. Smith's paper, Dr. JOHN MACINTYRE made some remarks on the subject, and referred to the cryptoscope, which he thought would be largely used for surgical work, although the photographic method would also have its place. He said that, although not at liberty to make any definite statement, he had information which led him to expect an important development of the cryptoscope within a few days. Dr. MacIntyre then showed on the lantern screen a number of his results, including human hands, feet, elbow and ankle joints; fish and frog, showing the skeleton very distinctly; also an interesting case, in which unsuspected disease of the bone had been found while searching for an embedded needle. He pointed out that in many cases the structure of bone was clearly shown.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE TRAILL TAYLOR MEMORIAL FUND.

To the EDITORS.

GENTLEMEN,—Mr. R. P. Drage, the Hon. Secretary of the Photographic Convention, has recently drawn attention in the press to the Traill Taylor Memorial Fund, and expressed the hope that the photographic societies will do their best to promote this good cause.

As the Secretary of the London and Provincial Photographic Association, I beg through your columns to appeal to my brother Secretaries throughout the country, and ask them and every member of a photographic society, who knew the late Mr. J. Traill Taylor, either personallly, or through his writings, to give this fund earnest and active support. The Committee have collected nearly 200*l.*, but this sum is quite inadequate to accomplish the purpose they have in view—the endowment of a lectureship.

The time has now come when the fund should be increased by smaller donations in large number, and the photographic societies are the best centres at which subscription lists could be opened. There are nearly 300 societies, and if each Secretary would open a list for small donations, as we have done at the London and Provincial, adding to it, if possible, a subscription from the Society collectively, it is certain that sufficient funds could be raised to make the Traill Taylor Lectureship of such importance, that men of high scientific ability and art training would esteem it an honour to give these lectures. Such a stimulus to photography is greatly needed in this country, where we look to public or private appreciation to do that which in many other countries is done by the State.

Ever willing to give advice and that of the best, because of his great experience and sound judgment; ever ready to promote a worthy photographic movement; ever ready to help a society, or a brother photographer, Traill Taylor was one of the most useful men of his time. Those who had the privilege of knowing him must feel how well deserved is this tribute to his memory, and to those especially would I appeal to bring this fund under the notice of the societies to which they may belong.

By such means only can success be ensured.—I am, yours, &c.,

88, *Evering-road, N.* PHILIP EVERITT.

KINETOSCOPY ON THE SCREEN.

To the EDITORS.

GENTLEMEN,—Referring to Mr. Acres' letter in yours of the 13th, stating that "a certain individual had advertised himself as being sole manufacturer of these films," and giving the impression that the successful manufacture in England was due to Mr. Acres alone, it is due to me to state exactly what occurred, leaving your readers to form their own judgment.

In December 1894 I was manufacturing kinetoscopes, and my friend, Mr. S., suggested that if I would construct a camera for taking the films he would introduce me to Mr. Acres, who could undertake the photography. On February 4 Mr. Acres called at my works, and agreed that, if I constructed the camera and tools at my own risk and expense, he would use it for taking films for me solely. He also handed me a sketch of an apparatus for photographic printing, and suggested that some of

the actions of this might be utilised for the camera. I pointed out that this could scarcely be done, and of seven mechanical motions embodied two were abandoned, and the remainder replaced by different actions suggested by Mr. S. and myself, only one unimportant piece being retained.

On February 5 and 6, 1895, I designed and constructed (with the co-operation of Mr. S.) a working model. By March 16 I had made drawings of, and finished, a complete kinetograph, for which Mr. Acres found a lens, but in designing the mechanism of which he took no part. Before this was finished, Mr. Acres verbally undertook to share the patent with me. After the kinetograph was tried and found satisfactory, Mr. Acres said he withdrew from this undertaking, and stated that he would purchase the camera, but claimed that he had a right to patent it himself.

On March 28, finding that Mr. Acres insisted on this, and that during the delay the demand for films was rapidly falling off, I gave in upon this point, Mr. Acres signing an agreement to produce films for me for a term of years from that date, and on March 30 our first saleable picture—viz., *The Boat Race*—was taken.

On July 12, 1895, Mr. Acres stated that he was no longer in a position to make films without being financed, and the agreement was cancelled on his paying for the outfit and compensation. Since then I have constructed a kinetograph on an entirely new principle, which enables me to obtain increased accuracy in the manufacture of the films.—I am, yours, &c.,

ROBT. W. PAUL.

44, *Hatton-garden, London, E.C., March* 17, 1896.

P.S.—Referring to the second paragraph of Mr. Acres' letter, I have submitted the matter for the opinion of Mr. Fletcher Moulton, Q.C., with the following result:—

1. Mr. Moulton is of the opinion that Mr. Friese Green's patent is limited to the actual details of working described by him, in conjunction with the use of the double lantern, none of which I, in any way, embody in my system.

2. Having submitted to Mr. Moulton the specifications of all kinetoscope projection apparatus, he states that my apparatus in no way infringes upon any of these.

PHOTO-CHROMOSCOPES.

To the EDITORS.

GENTLEMEN,—Mr. Ives's ideas of "fair" and "courteous" language, as expressed in his last letter, appear to me to be somewhat hazy. I would remind him that the whole of the present correspondence has been necessitated by his use of uncourteous language and thinly veiled innuendo.

A very good example of his methods occurs in this last letter of his, when he attempts to reconcile his former contradictory assertions by having recourse to Jesuitical sophistry to define the difference between insinuating that I copied his instrument and actually saying that I did so. Unfortunately for himself, he destroys this metaphysical fabric, and appears in his true colours in the latter part of his letter, where he not only charges me with copying his apparatus, but says any improvements I claim in my own instrument are merely "tricks" with the "deliberate intention of getting around" his patent.

Let me inform Mr. Ives that this species of "courteous" argument is no proof, besides being unworthy of a gentleman, either posing as a scientist or "puffing" a patent, and is likewise an insult to your readers, to most of whom I am, perhaps, better known by reputation than Mr. Ives.

This is the language, and those are the tactics he has employed throughout the discussion, and he has no one but himself to thank if he finds himself reduced to the whine which terminates his last letter, after having so loudly claimed everything connected with colour photography.

Mr. Ives's copious extracts from U.S. specifications (which have nothing to do with British patents) may serve the purpose of a cheap advertisement, but they certainly do not prove my invention to be his, nor disprove my former description of his preposterous claims and his misleading statements.

Take, for instance, the essential points of his patent claims, as italicised by himself. Does he mean to say that he claims, "by priority of invention," the inclination of mirrors at an angle of 45° either to a vertical or a horizontal plane? If this is so—and he emphasises this point—it appears to me an example of either absolute ignorance or downright arrogance.

Again, he emphasises by italics "means for varying the angle of such instrument," &c., and would have us accept this as one of the brilliant points of his apparatus. A reference to his specification will reveal in this original (?) "means" our old friend the camera strut, a method which has been applied to every piece of inclined apparatus years before Mr. Ives was born.

As for the third paragraph Mr. Ives considers important enough to italicise, it appears to me a most invidious task to determine whether he claims to have invented a window, a light sky, or the angles of illumination!

When Mr. Ives so "courteously" insinuated that my instrument was his own "with differences of detail only," I asked what was his apparatus but the labours of others modified to suit his fancy? Mr. Ives has carefully avoided answering this, and I think it would interest your readers to illustrate my meaning in one or two points. I am obliged to Mr. Ives for calling attention to Cros's specification of November, 1888, as it very materially helps us in such an examination. After reading this it seems difficult to imagine how Mr. Ives can pretend to uphold his sweeping claims in the face of a patent which contains the whole essence of his photo-chromoscope, and dates so many years before him. Neither space nor time permits of my publishing the drawings from this interesting document, but I would advise every interested reader to obtain a copy and judge for himself. Suffice it to say, but for the introduction of his much-vaunted coloured reflectors, and putting the instrument on its side, with some other "differences of detail only," there is a most remarkable resemblance between Cros's apparatus and Ives's photo-chromoscope camera.

Now as to some other of Mr. Ives's claims, "the results of his honest labour." Take, for instance, his oft-repeated claim to be the originator of the principle of producing the three-colour records by means of the various rays which go to produce the colour sensations—a principle which he has loudly proclaimed as his own on the other side of the Atlantic. This claim is unfounded; the entire principle was fully and minutely described by M. Du Hauron in a communication to the Société d'Agriculture, Sciences et Arts d'Agen, on September 6, 1875.

Also in the same communication appear full particulars of the method of producing colour transparencies by superimposed coloured gelatine films, a process which Mr. Ives claims as his own "by priority of invention," &c., and the use of a modification and improvement on such by MM. Lumière he publicly described at the Photographic Club as "a pure steal" from him.

Again, the principle of taking the three negatives simultaneously, which he deliberately tries to construe me into acknowledging as his, is not his at all, but may be found in M. Cros's specification, and is fully disclosed by him long before the date of Mr. Ives's triumphs (?) at the Franklin Institute in Philadelphia.

As for the question of semi-transparent silvered mirrors and Mr. Ives's evident anxiety to get me to yield him the priority in those, I consider the "trick" too transparent for your readers. A reference to the context, and the mere presence of a note of interrogation after the words "his own (?)" (p. 174), would surely be sufficient to convince a person of ordinary intelligence of the ironical vein in which it was written, unless, like Mr. Ives, he had an axe to grind.

It is not true that partially silvered mirrors have ever been used by Mr. Ives, or even suggested by him, for the purpose for which I employ them, as described in my specification—*i.e.*, not only to avoid double outlines, but to have the reflecting surfaces so prepared as to accord each negative its proper proportion of light. I challenge Mr. Ives to prove that he was even aware, before he saw my camera, that such silvered mirrors could be made or used for those purposes. I do not forget what he said when he saw them for the first time in my camera. As for his sneer, that improvements in such mirrors have not originated from me, I can honestly claim that those I make are done by my own method for my own purposes, which is considerably more than Mr. Ives can say as to improvements in platinised mirrors, real or fancied.

It seems to me, the more one examines Mr. Ives's claims, the more are they open to objection, and I imagine, if he submits them to a legal test, which, after his "courteous" letter in your last, seems the most manly course to follow, he will have to disclaim so much of his "honest labour" that there will be nothing left worth fighting for.

Touching his brilliant (?) idea of the reason for my challenging him to try to prove his claims by opposing my patent, he evidently considers it better to obtain a cheap advertisement by prolonging the correspondence than submit his case to a true test. Your readers can have little interest in a patent wrangle, and must be wearied of reiterated claims, and this, as I stated before, is my sole reason for challenging Mr. Ives to prove his words. Surely his "patent attorney," who seems so smart in evading "tricks," was competent to advise Mr. Ives that the powers of the Comptroller are not so limited as he would like the public to believe, and that there is an appeal from him to the English Courts, where he will find full justice for all his claims.

His reference to the French patent appears to me, to say the least, most unfortunate, after M. Nachet's denouncement of it on page 125, and, for all I know, his Austrian claims may be in the same list.

I am quite unscared by any "bogey" Mr. Ives may raise to depreciate the value of my instrument, or frighten purchasers. As for my methods being "retrograde," "useless," &c., permit me to inform him that the public are better judges of this than he can possibly be, while "puffing" his own apparatus. It would be much wiser for him not to proclaim the superiority of his patent rights and the uselessness of mine until he has legally had them so decided.

To sum up, I do not employ Mr. Ives's ideas, nor do I wish to make his photo-chromoscope, neither do I intend to allow him to mak my apparatus, which I think far better than his. It will rest with the public to decide between them. I will take all the risk of Mr. Ives's pretended "priority of invention," &c., and, if he attempts to interfere, or *even threatens to interfere*, with the manufacture and sale of my apparatus, I will *compel him* to submit his claims to the proper legal tests as provided by our legislature.

What more remains to be said?—I am, yours, &c.,

March 23, 1896. B. J. EDWARDS.

CHLOROPHYLL.

To the EDITORS.

GENTLEMEN,—In view of the inquiry of "W. H. G." (p. 184), I wish to call attention to the fact that I have not used or recommended chlorophyll as a colour-sensitiser for several years, because, owing to its gummy nature, it does not act well upon the gelatine dry plates now so universally employed in photography. It is the best colour-sensitiser for collodio-bromide emulsion, but one of the poorest for *gelatine* emulsion plates.

I achieved remarkable practical success with chlorophyll from leaves of "blue myrtle," otherwise "periwinkle," or *Vinca minor* (very common in America), after obtaining only very weak effects with chlorophyll from other sources. Strong, dark-coloured solutions were easily made, with alcohol, in a few minutes, and showed more absorption in the yellow and green of the spectrum than other chlorophyll solutions. It sensitised strongly for all colours, but the plates had to be prepared in a particular way, and *exposed wet*. Fresh chlorophyll from growing leaves, gathered in early summer, gave three or four times greater sensitiveness than chlorophyll which was preserved in solution by the addition of zinc powder.

Although no method of orthochromatic photography can give better results, as good results can now be obtained with less trouble by employing commercial gelatine-bromide plates (orthochromatic or "ordinary") *with special colour screens*.—I am, yours, &c., F. E. IVES.

24, *Southwick-street, Hyde Park, W., March* 20, 1896.

THE ARTIGUE PROCESS.

To the EDITORS.

GENTLEMEN,—I thought that Mr. Maskell was in no particular hurry as to this matter, as there was an interval of about seven weeks between the publication of my article and his remarks upon it. However, I had already begun to write a few further notes before I saw his letter of last week. These will, doubtless, be published in the same journal as my first observations on the process.

Kindly allow me this opportunity of stating that Mr. Maskell's supposition that "Dogberry" and I are one is not correct. I have not even the pleasure of knowing who "Dogberry" is.—I am, yours, &c.,

Ealing, W. CHAPMAN JONES.

To the EDITORS.

GENTLEMEN,—The discussions on the carbon processes without transfer will never finish if your contributors continue to make such confusion between the Artigue process and the bichromated gum process. They are both founded on the same principle, but the nature of the film and its preparations differ widely in both cases. So, when Mr. Pouncy talks about the directions given by Mr. Maskell to Mr. Benington as to sensitive coating, and uses these directions as a proof that the Artigue process has been discovered by his father, he is quite in the wrong, for Mr. Maskell's directions to Mr. Benington had nothing to do with the Artigue process, but were applied to the bichromated gum process. There are directions to be given about the coating of Artigue paper, for the simple reason that this paper is sold *ready coated*, the method and substance used in coating being kept secret by the inventor, Artigue. It is supposed that the substance is fish glue, and the method the powder box, but nobody has yet succeeded in producing a similar paper. As to the bichromated gum process, it was discovered by Poitevin in 1856. It is the oldest of all carbon processes.—I am, yours, &c.,

Paris, March 20, 1896. ROBERT DEMACHY.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

CHLOROPHYLL.—W. T. BASFORD. Thanks; you will see we have a letter from Mr. Ives on the subject.

PRINTED MATTER ON SENSITIVE SURFACES.—W. SAVILLE KENT. Thanks; the phenomenon of printers' ink impressing sensitive surfaces is well known.

SILVERING MIRRORS.—B. ATKINSON. The formula referred to will do quite well for silvering mirrors that are to transmit as well as reflect light. The operation, however, must be stopped at a very early stage.

C. LAUDS.—By removing the centre combination of the triplet lens the focus of the instrument will be shortened, and it will, consequently, be more rapid; but it will then only cover a very small field as compared with what it does in its entirety.

CARBON TISSUE.—A. W. Carbon tissue in the insensitive state may, we surmise, be had from all the large dealers. In the sensitive condition it must be had direct from the makers, as it does not keep good for more than a fortnight or so, therefore dealers do not stock it.

COLOURING.—WALES asks: "Can you inform me of a firm that publishes a book for colouring photographs, cabinets, heads, &c.?"—All the (few) works we know of on this subject are, we think, out of print. Possibly Messrs. Newman & Co., Soho-square, may have some copies of their work left.

TONING MATT COLLODIO-CHLORIDE PAPER.—G. P. says: "I should be very much obliged to you if you would give me a formula for toning matt collodio chloride prints to make them look like platinotypes."—We know of no better formula than that the Paget Company supply with the matt paper.

LENS FOR LANDSCAPES.—W. C. P. writes: "As I understand that the front lens of a portrait combination will do for landscapes, how would one of the combinations of a Dallmeyer's patent view-lens do? Which combination would be the best, back or front?"—The lenses constructed specially for landscapes by Mr. Dallmeyer are single combinations.

VALUE OF LENS.—BEGINNER (Walworth). A half-plate portrait lens, without a name upon it, may be very cheap at fifteen shillings, or it may be dear at any price, and many such lenses are. All will depend upon its quality. We have occasionally seen lenses without a name upon them that would put some in the shade that had one upon them.

PALMER'S INTAGLIO PROCESS.—AN ARTIST READER says: "Please inform me if there is anything to prevent me from practising Palmer's Autographic Intaglio process of 1842, the patent of which is, I suppose, expired long since; and where can I see the specification of Palmer's patent?"—Nothing whatever. If the process were patented, the specification of it can be seen at the Patent Office. We have a strong impression, however, that Palmer did not patent the process at all.

FINISHING.—BROMIDE asks: "Is there any book giving instructions for finishing bromide and carbon enlargements in black and white? Does the surface require washing with a preparation before working up so as to destroy the gloss? If so, what preparation is used, and is it supplied ready for use?"—The best work on the subject was Wake's, long since out of print. The gloss on the surface may be destroyed by rubbing it over with an "ink-eraser," or with *fine* cuttle-fish powder or pumice powder.

BUILDING LAWS.—STOPPED. If the Town Council has served you with notice to take the studio down on the grounds that it is against the Council's by-laws, that plans were not submitted before building, and that it contravenes the building acts generally, we surmise you will have to pull it down if it insists, that is, supposing the allegations are correct. However, we should advise you to see the Town Surveyor, and it is possible that the building may be so modified that it may be permitted to remain where it is. We should not recommend you to fight the Council over the matter, as it would be a costly affair, and your chances of being successful are remote. Better appease the authorities if possible.

SUPPORT FOR CUT FILMS.—R. W. says: "I have just been making a trial of cut films, placing them in an ordinary dark slide, with a piece of card to make up the thickness. My slides, being solid, have no rebate to them, but only buttons to retain the plates, and I have found that the film sometimes curls sufficiently to prevent the shutter being closed after an exposure. I think I could overcome this difficulty by spreading one side of the backing cards with some sticky substance, to which the films would adhere when placed in contact with. But I am at a loss as to what to select for this. It must, of course, be fairly dry, for, if too messy, it would get on to the surface; on the other hand, it must not be too hard, like black varnish or copal, otherwise, when the exposed films were packed away back to back, it would be impossible to separate them for developing; also it must retain its moist condition, so that new films will adhere to it at any time when it is desired to recharge."—In reply: Fitch, of Fulwood's-rents, supplies cards coated with a moist adhesive suitable for your requirements.

*** *As Good Friday falls next week, we shall go to press a day earlier than usual. Will our contributors and correspondents therefore please note?*

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EX CATHEDRÂ.

Under the direction of Mr. J. Le Couteur, the Photographic Association has been formed, with premises at 16, Brook-street, Hanover-square, W., for the assistance of amateurs. Subscribers receive among many advantages those of instruction, development of negatives, assistance in the purchase of apparatus, use of dark room, and "free criticism of negatives." As the subscription is not very large, the benefit to the subscriber under the latter head should alone be worth the money.

* * *

Mr. W. Thomas, the Chairman of the Affiliation of Photographic Societies, writes to us in regard to the "Affiliation Lectures" already announced: "Will you kindly draw attention to the fact that it has become necessary to alter the date of the opening lecture, by Captain Abney, from the 10th of April to Wednesday, the 15th of that month, Captain Abney having to be in Leeds on the date originally fixed. All the following lectures will come on the dates fixed without alteration."

* * *

In reference to the names that have been suggested for the New Photography, Dr. David Walsh (Temple) writes: "Your late interesting editorial drew attention to the want of a comely and convenient term for what is now known as 'the New Photography.' Perhaps I may venture to suggest 'shadow type' or 'shade picture' as possible names. At any rate, the use of such expressions as 'shade printing' or 'shadow printing' a fracture, or 'a needle was shade-printed in such-and-such a position,' would be less barbarous than many of the cumbrous periphrases now springing into vogue."

* * *

Messrs. Berger & Co., of South Hill-park, N.W., manufacturers of the "Luxia" P.O.P., ask us to state that they desire to apologise to their clients for the delay in the execution of their orders. This has been caused by an accident at their works, which, however, is in process of repair.

* * *

Our transatlantic *confrère*, Dr. Edward L. Wilson, the Editor of *Wilson's Photographic Magazine*, has made his appearance before the great American public in the pleasant character of a celebrity. His portrait and biography are given in No. 6 of the second volume of *Celebrities' Monthly*, issued by the Automatic Photograph Company of New York. Maurel, Ella Wheeler Wilcox, Mdlle. Bauermeister, Edward H. Sothern, and Richard Croker are also given place in the same part, so that Mr. Wilson has the gratification of sharing his celebrity in good company.

* * *

Messrs. Eddison, Limited, gave all the employees at their various establishments at Leeds, Huddersfield, Halifax, Dewsbury, Barnsley, &c., an "outing" to Bradford on Thursday, March 26, for the purpose of enabling them to inspect the extensive new works at Grosvenor-place, Manningham-lane, which have been erected especially for the purpose of concentrating under one roof not only the ordinary printing and enamelling rooms, but also artists' rooms, and workshops, for every department of the Company's extensive and rapidly increasing business. Each department has been carefully and thoroughly supplied with every possible convenience, and with all the latest improvements and appliances for securing better work in less time and at less cost, so as to enable the Company to raise still higher the standard of excellence they have already established for themselves.

Evidently the visitors were highly delighted with all they saw, and subsequently over a hundred of them sat down to a capital dinner provided for them by the Company at Hanson's Restaurant, under the presidency of the Managing Director, Mr. J. E. Eddison. This was followed (after the usual toasts had been given, and some remarkably good songs had been sung) by a most enjoyable dance.

TO ASSISTANTS SEEKING SITUATIONS.

Whether photography be looked upon as a business or a profession, the relative number of the employed compared with the employers is gradually but slowly increasing. Forty years ago a photographic "assistant" would have been a rarity, but so vast now are the ramifications of the science and its applications, artistic and otherwise, that photography has become a most important industry. Concurrently with this uprising of a new industry have become the expensive outfit necessary to start a photographic studio or a photo-mechanical establishment, and the creation of a large body of assistants to help to carry on the various necessary branches. It is to this large body of workers, at a period of the year when their services are beginning to be in demand, that we desire to offer friendly counsel, such as, from contact with a large number of employers, we are led to believe is really needed.

Let us follow the usual course of replying to an advertisement and its results. For some time past photography has undoubtedly been in low water, and the number of unemployed is so great that, in whatever department an assistant is advertised for, a large number of replies is sure to be received, and time will be needed for the employed to wade through them. If this obvious fact were well borne in mind, much trouble would be avoided at the outset.

The first thing to be done is to read the advertisement carefully, and, in writing a reply, to be careful to give all the information asked for. If this be not done, such imperfect applications are likely to be at once rejected, as the natural inference would be that the information withheld would be of an unsatisfactory nature, and where there is, as is almost sure to be the case, plenty of choice, the employer will not waste time over useless letters. If age is asked, give it. If particulars of previous employers is wanted, supply them. Above all, when the salary required is an item in the advertisement, the applicant should make up his mind to name a sum, and not shillyshally in the hopes of driving a better bargain. Unless the applicant has something special to recommend him, such letters would be thrown aside.

Next comes a very important matter, whether to enclose a stamp for reply or not. It is not a necessity, but, as a mere matter of getting a settlement, the enclosing a stamp would, in the majority of cases at any rate, ensure an answer when the application had failed.

When it comes to a similar question with regard to stamps for return of specimens, our most urgent advice is that stamps be sent, that no loophole be left for some of the unscrupulous ones who we hear of so often retaining valuable specimens (the only means in many cases of obtaining a post), an action of such turpitude that we find it difficult to find words to express our abhorrence of.

Let us follow a number of these applications by entering the sanctum of the advertiser. If a place of any importance, there will be dozens of replies, with all sorts of packages of specimens. We have the best grounds for saying that the carelessness with which these packets have often been sent is beyond belief. Some will be perhaps tied up with a bit of sewing cotton, others more strongly tied, but packed as though they were articles of ironmongery, nothing to prevent the mounted prints from rubbing against one another, and perhaps no outside boards to protect from the post official stamp. It is the smaller moiety that is carefully and properly packed. The packages are next opened, and still more carelessness presents itself. A large number actually contain no memorandum whatever to identify them, and, if the defacing stamp, showing office of origin be illegible, pure guesswork only can supply the sender's name; and yet, whenever prints are lost under such conditions, the unhappy advertiser is branded as a cheat and a rogue.

Then, the specimens themselves. There may, in the sundry replies, be perhaps a hundred or two in the aggregate of other people's pictures, and yet we are credibly informed that not one in ten has the owner's name written upon them. It is not every employer who is a systematic business man, and, when he is not, it is easy to imagine what will happen if by any chance the contents of the packets get mixed, say, by the chance upsetting of a neatly piled set of packets. Is it to be wondered at that some masters, selfish ones it may be, throw them into a drawer and say: Let them be fetched, we will not spend our days in sorting them out, taking trouble that careless people should take for themselves? We do not say we hold with such views, but sensible applicants must take the world as they find it.

It is utterly futile and foolish to say "masters ought to do so and so," for that has nothing to do with the matter; the question to be considered is, What masters are likely to do, not what they ought to do.

Now, as to returning all these things to their unsuccessful owners. No doubt, the senders have thought it plenty of trouble to pack up their pictures "on the mere chance of getting a berth." Let them look on the other side of the question. What must the trouble be to the employer, or his assistants even, who have to return some dozens of these packets, each one to its legitimate owner? One person, working at nothing else and for ten hours a day, could not pack up pictures for, and reply to, a score or two of applicants. It is, then, little to be wondered at if his patience fails him, and again the drawer is opened for the throwing in of numbers of luckless specimens.

Very much more could be said in the same way, but we trust that what we have written will be well thought over by those who answer advertisements.

To summarise our advice, we will conclude by a few maxims for those who are seeking posts by replying to advertisements:—

1. Write legibly and to the point; answer all the queries of the advertisement.

2. Enclose a stamped addressed envelope for a reply.

3. If enclosing a "portrait of self," let the sender's name be legibly written upon it.

4. In sending specimens, let stamps for return invariably accompany them, with also a suitably addressed cover for their return.

5. Let every specimen have its owner's name (and preferably address) written plainly on some part of the picture or mount. If on the picture itself, there is little danger of dishonest persons retaining them.

6. Let every parcel be neatly packed and securely tied, and let nothing "of the nature of a letter" be enclosed in a packet sent at book-post rates.

If these recommendations are carried out, trouble will be saved and anxiety allayed.

Paper Negatives.—At one of the late meetings of the North Middlesex Photographic Society a paper was read on *Enlarged Paper Negatives*. "Its author," the report says, "told how paper negatives were made long before glass plates were in use; but the exposures for landscapes then necessary ran into hours." This is another illustration of the tendency of modern workers to depreciate the older processes without really knowing anything whatever about them. Fox Talbot's was the first negative process, and that was on paper. With it, with a portrait lens, and a fair light, a portrait could be taken in the studio in from twenty to sixty seconds. With a single lens, used with an aperture of *f*-30, and a landscape, in a tolerably good light, the exposure would be from three to ten minutes.

The wax paper, a slower, dry process in which the paper would keep some weeks after preparation, required a longer exposure; with a single lens working at *f*-30 a landscape, in a fairly good light, would require from fifteen to forty minutes according to the subject. Greater rapidity than this, however, could be obtained by sacrificing some of the keeping qualities of the paper. The old processes, it is true, were very slow, as compared with gelatine plates, but they were not nearly so slow as some modern writers, who have had no experience with them, would lead the present generation to believe. If the author of the paper that has called forth these remarks were to master the first negative process—Talbot's—he would find that little, if any, longer exposure—possibly less—would be necessary than that with the paper he is now using.

The Art World.—Artists are now hard at work in view of the different exhibitions which will open their doors within the next month or so. Already the art publications are telling us the titles of the different works that the principal painters are sending to the Royal Academy and other shows. This year, owing to the death of its late President, Lord Leighton, it has been decided to forego the annual Academy dinner. At the Welsh Eisteddfod, which is to be held at Llandudno in June, there is to be an Art Exhibition, at which it is hoped to show some 500 or so of works by living artists. An Art Exhibition is quite an innovation in connexion with the Eisteddfod, and will not, we believe, be at all confined to Welsh painters. Possibly the present innovation will be extended in future Eisteddfods to a Photographic Exhibition. Wales teems with beautiful scenery, as every votary of the camera is fully aware, and a Photographic Exhibition in connexion with this annual national gathering could scarcely fail to be an additional attraction.

The Balloon Expedition to the North Pole.—For a long time past reports have been appearing as to the active preparations that M. Andrée is making for his balloon expedition to the North Pole—the progress in the construction of the balloon, &c. Some months back, it will be remembered, we mentioned the enormous number of cylinders of compressed hydrogen it was proposed to take to fill the balloon at the starting point, and the remark we made at the time that it was rather a "tall order" for compressed hydrogen. The latest report is that the vessel, the *Virgo*, which is to take the balloon and its appurtenances to Spitzbergen, will also take between thirty-five and forty tons of sulphuric acid for producing the hydrogen for its inflation. If this be the case, we surmise the project of taking the hydrogen, compressed, in cylinders has been abandoned. If, say, thirty-five tons of sulphuric acid is necessary to produce the quantity of hydrogen necessary for the balloon, it would, indeed, have been a big order for the gas in cylinders, and for the cylinders themselves.

Plates for the Röntgen Rays.—At the recent demonstration at the Photographic Club several important points were mooted with regard to the most suitable plates for the Röntgen process without anything definite being arrived at. Authorities were quoted that there was no difference between the slow and the most rapid, also that commercial orthochromatised plates had no advantage over the ordinary, and by some that they had. Just now investigators seem to be devoting themselves almost exclusively to the improvement of the tubes and the "light," but there appears to be little done in the direction of the plates to receive the image, and their improvement if possible. Plates can now be specially sensitised for the different rays of the spectrum, and it is more than probable that they can for the X rays. We are told that two members of the Club, who are adepts at dry-plate making, have promised to take the subject in hand. A noteworthy feature in the most recent work is that the exposure has been shortened, while the results are improved. This leads one to ask whether, in the earlier ones, which were faint and indistinct as compared with recent ones, over-exposure, speaking photographically, was the chief cause of the inferiority?

Salt as a Fixing Agent.—Last week we had occasion to correct our amateur contemporary on a historical point in connexion with one of the pioneers of photography in this country. In its last issue, our contemporary says that a common salt fixing bath, the introduction of which it noted recently, was suggested by Dr. Liesegang about seventeen years ago. "He used a saturated solution of common salt, to which a little ammonia is added." As we said last week, when early events in photography are quoted, they should be given correctly, or they will be misleading to the rising generation of photographers. Common salt was really one of the first fixing agents used in photography. Fox Talbot used it for fixing his first pictures in the "thirties," and Daguerre also employed it at first in his process, but used hyposulphite of soda later on.

Ammonia, too, was one of the earliest fixing mediums. It had, however, to be used very dilute, otherwise it weakened the silver image; that was before gold toning was adopted. Later on, when gold toning was in vogue, it was strongly advocated by some. In a paper read before the Photographic Society, in 1855, by Mr. George Shadbolt, a former editor of this Journal, he strongly advocated the use of the ammonia fixing bath, and gives the proportions as one part of strong liquor ammoniæ to three or four parts of water as being suitable. Ammonia is, in many respects, an excellent fixing agent for chloride prints, as with it there is no fear of sulphur compounds being formed, and the chloride of silver is freely soluble in it. Ammonia can, however, only be used for plain paper prints, as it acts upon albumen. It is, as well, exceedingly unpleasant to use of the strength requisite. The time of fixation is about the same as with, the usual strength, hyposulphite of soda. We merely refer to these two fixing agents to point out that their proposed use is not such a modern suggestion as our younger contemporary would lead its readers to imagine.

ON THINGS IN GENERAL.

The rage for Röntgen pictures is something akin, only more so, to the furore for photographing which set in when Archer's discovery first made the science popular. The extent to which it has seized hold, alike, of the public and the photographic manipulator, expert or otherwise, is simply marvellous; there is hardly a village school whose chief has not taken Röntgen pictures and given the inevitable lecture. Any one who has had really practical acquaintance with the work knows that all the talk about a four-inch spark coil being needed is all moonshine. Properly worked, a coil, costing a few pounds only, used with Opie's medium, is quite capable of giving excellent reproductions of the familiar bunch of keys, and what might be termed the nauseating coin, if it were not that the general complaint of the photographic practitioner is that he never gets nowadays such a surfeit of coin as to create a nausea. Then, again, as to the tubes—what a harvest the tube-makers must be reaping!

Mr. Freshwater tells us that the best form is the so-called "focus-tube" of Newton, which, in his hands, and using a two-inch spark coil, gave good results with two minutes' exposure. Yet, about the same time, Mr. Gifford (who is a better authority) writes to *Nature*, stating that the best results can be obtained with the original spherical tube used by Crookes in 1879; but, using a five-inch spark coil, and a new tube of this kind, he deemed three minutes the needful exposure.

As to price, I note the first page of the JOURNAL advertises a set at 23*l.* 5*s.*, and in another place a modest couple of sovereigns will buy the needful! Many people have been wondering how it is that Edison has not been to the fore in this matter; but, according to the latest report, he has made his start. He has been experimenting with nearly two thousand substances, and at last has found one which is so fluorescent that he can see right through the structure of the human body by its aid. But he shrouds this substance in mystery, and will not disclose its composition to a single soul.

There appear to be signs of a recrudescence of an old carbon printing warfare. I say, let it go on for a while, nothing but good will follow from it. Novelties are ever looked for, and, if what is generally looked upon as a novelty has also good points, a little judicious discussion will give it a useful fillip. That there is something to be learnt in carbon printing is patent to any one who paid attention to the work at last year's Salon. There were some effects simply exquisite. I must, however, put on record my belief that a good carbon print, taken on a piece of ground glass, has a delicacy and finish all its own, and which will take something very superior to beat it.

Then we have the new Herkomer printing or engraving process, evidently possessing qualities of merit, but at a recent meeting of the Royal Photographic Society Mr. Bolas conclusively showed that there is nothing new in it, that Palmer over half a century ago described the same or a better thing; in fact, slightly to paraphrase an old criticism, "What is new is no good, and what is good is not new."

The discussion on lenses at the London and Provincial Photographic Association was one of that class that is most fruitful in information and knowledge. It was interesting to have recalled to mind Professor Piazzi Smyth's work—a monument of perseverance under conditions of extreme personal discomfort and climatic conditions in the highest degree inimical to good work. It was the "good old times" of wet collodion, which in the sultry atmosphere of Egypt, and in the dusty, murky darkness of the Pyramids, must have been as excessively trying to the physical frame as to mental equanimity. But is Mr. Dallmeyer correctly quoted? He is represented as saying that Professor Smyth got rid of curvature of the field by the use of a strong negative lens just in front of the plate. My recollection of the method is that the Professor first employed a piece of plain glass, and then improved upon it by substituting a piece which on one side had been worked to a slight concave curve. The discussion on the proper position of the stop to avoid flare was not very fruitful. Mr. Dallmeyer said there really was no rule; and that is just the way to look at it. That there really is no rule is evident from the fact that many lenses have been sent out from houses of the highest repute, yet exhibiting flare to a most marked degree. The remedy is very simple for flare when it does exist; it consists merely in altering the position to a more suitable one by the simple plan of trial and error. Of course, it involves a rearrangement of the diaphragm holder, and this is the difficulty for the photographer not accustomed to working in brass.

Mr. R. W. Craigie deserves well of his brother photographers for, after first unearthing, finally burying or leading to the burial of that old superstition that no one but a foreigner has been permitted to photograph the pictures in the National Gallery. We have it on the authority of Mr. Charles L. Eastlake that "the privilege has been accorded to numerous professional photographers both in London and the provinces." But to avoid the place being crowded out amateurs are not permitted. This is unfair to the amateurs; they ought in fairness, as taxpayers, to be able to photograph on suitable occasions by obtaining permission after sending in a special application. But I think Mr. Craigie has been travelling beyond his brief in two directions. First, in suggesting that the time and trouble required to do the work well would not be given by the professionals; secondly, in saying that copying pictures is the very work that amateurs excel in. I have never seen good amateur work in this direction. Copying paintings requires practice and knowledge, and the possession of a variety of adjuncts such as few amateurs can boast of.

I admire the calm way in which our Editor raises a smile against the *Microscope* giving a certain formula for a new ink without making a comment, but it is too good to be allowed to pass without further notice. We are directed to make an ink by dissolving shellac in half its weight of Venice turpentine, and then to stir in as much lamp-black as turpentine. The formula is an excellent one, but it possesses a slight defect, inasmuch as shellac will not dissolve in Venice turpentine, to begin with. Further, if by any means they were made to mix, the lamp-black could not be combined with it at all; and finally, if the whole three constituents could by any means be amalgamated, it might do for putty, but would certainly not do for ink.

FREE LANCE.

DIGRESSIONS.

IV.—BOGIES.

WE are all afraid of bogies, and timidity is the bane of art. It is only the strong—or the utterly incompetent—that dare the risk of being original; mediocrity does not venture to experiment, except on the usual lines; it is surrounded by bogies who take care that it shall only do what others think proper. There is this difference, however, between the weak and the strong. Originality, as a rule, comes slowly to the strong, it grows with them, it broadens down; with the weak, it usually bursts forth suddenly, and the flash quickly expires. The one produces substance, the other shadow.

Originality, from whatever source, is often set upon, and sometimes suppressed, by bogies. In photography, for more than fifty years, we have been troubled by the arbitrary bogies of right and wrong, down to the merest details of practice. There are many who prefer to discuss work than to do it. I don't say that it has not been very pleasant amusement, but half the arguments that have taken place on our art have been as to whether this or that was legitimate; whether, for instance, a pinhole may be stopped out of a negative, and, that interference with nature conceded, what may be the size of the pinhole; and I believe that tremendous problem is not yet settled. It is a similar question to the Asian mystery as to how many angels could dance on the point of a needle. A simple-minded experimentalist would have contracted for a quantity of angels, set them up on the given coign of vantage, and counted them. I believe many an otherwise good negative has been spoilt because the conscientious photographer could not decide how large a hole it would be lawful to stop.

I think it may be taken as an axiom that a new thing cannot be orthodox, and that it is absurd that a new thing must be like all others of its class; yet I remember how, forty years ago, I was roundly abused for printing a sky to a landscape from a separate negative—a thing done by everybody every day now—because it was not orthodox. The latest and funniest form of bogie is that young critic who, when writing on art, condemns combination printing, and, when working as a photographer, depends on that useful method for his effect.

Bogies of this kind, both in our mechanical practice and artistic imaginings, have come in clouds, until it culminated on the mechanical side in our being told we must expose exactly and develop with precision and by machine, and not according to the wicked will of a man with a fancy, or another who had the still further audacity to do without a lens altogether. On the art side, the bogie shook his head if we did not screw up our lenses to the concert pitch of the optician, and at one time there was a fear that the Royal Photographic Society would issue a proclamation that no photographer should be allowed to use other than a particular-sized plate, or include more than a certain angle, as by law provided, and the "turn of the screw" was as much discussed in the Council Chamber as if it was the deepest dungeon of the Inquisition. The Battle of the Standards is, I believe, still going on, the last fight being, or was lately, in progress in Philadelphia.

The astounding thing to me is how any of us, with all these restrictions, have ever made anything approaching to what we diffidently call a picture. Even some of the most enlightened still have their conventional notions of right and wrong. That great question of using more than one negative in a picture depends, in the advanced, illogical mind, upon how many. One appears to be legitimate, two or three are not.

A shocking bogie is that of criticism. Originally intended to lead, aid, and correct, it is too often used to over-praise or over-condemn. Either may or may not do good, according to the constitution of the victim; but there would be difficulties about getting a medical certificate in every case, and the critical bogie should not be too violent on the young. The neophyte is usually terribly afraid. It takes him a long time to find that even the best of its kind is not supernatural, after all, and that the bogie is only a turnip lantern to which the electric light has not yet been fitted. A terrible disillusion, out of which, however, if taken philosophically, some fun may be got, if not much knowledge. But to the healthy, mature mind all criticism is good (except the fulsome), just and unjust alike. Just criticism is sure to teach you something, unjust to set your back up and put you into fighting trim. It is the morbid mind that suffers, and the timid that is afraid of being true to itself for fear of doing sixpennyworth of temporary damage. After all, the best way to meet any kind of criticism is to do better work.

Then, the critics themselves in their turns have their bogies. Some critics may be greatly pleased with a picture, but, not knowing how it is done, dare not give themselves away by stating opinions of their own. Few dare say, as I say now, that I have often found myself at the top of this particular tree. I often find that I am asked for information on a subject of which I know nothing. I find it best to face the music and confess ignorance. "The courage of his opinions" is a good phrase for something very rare, in both meanings of the word "rare."

Questions on some subjects about which I know everything puzzle me to answer more than the more recondite. As I write comes a letter from a quarter-plate instanto amateur, asking me if I pose my figures myself, and if I do them instantaneously. I can only reply by asking him if he thinks I am a fraud, and if he will kindly define the word "instantaneously." Then those dreadful handbooks give one no end of trouble. Here is a question just received, "Do you consider you can take a satisfactory snap-shot in the shade? One book says you can, and another says, Always take them in full sunlight?" I take the opportunity of hereby solemnly declaring that I don't know, and, further, that I don't know the least bit of anything that is to be found in a technical handbook; and, if I did, it would cost me a great deal more to write than the inquirer to read. These be my present harmless unnecessary bogies, a little troublesome at times, but, after all, they repay cultivation, and I would not be without them.

The bogies sometimes gather together in great force for a combined purpose. The last occasion was when obstruction or vested interest took them on as mercenaries to hinder, or perhaps frighten, the Salon out of the field, but the Linked Ring turned on the searchlight of "Art and Liberty," and the bogies, like the Boojum, "softly and suddenly vanished away."

The result of the last dispersal is that the art photography of the world is now vastly improved, and the Salon is recognised as the centre of the art photography of the world. The minor exhibitions of England have improved, although still greatly hampered by those who have their own axes to grind. Then, there is the hanging bogies. The Royal Society last year had some good pictures sent in, utterly spoilt, however, by the worst hanging any pictures were ever subject to. Why does not the Society recognise its deficiency in this respect, and employ an expert from the Linked Ring, as it does its Judges? The good of the art should be the one thing looked to, nothing smaller.

Another improvement is that photographs are not now judged by line and rule. It is true that many exhibitions are still minutely divided into classes—that is done for business reasons—but a man may now produce a picture about which even he himself has to look on the back before he can truthfully say which is top or bottom without producing a smile or a mild witticism. Compared with the past this is liberty indeed, and, as usual, freedom is not abused. I had forgotten the *Cricketer* in the last Salon when I wrote this. I don't think that the most blundering critic will confess to seeing more than three or four photographs a year of which he could not make head or tail; but most critics have more to say of pictures of this kind than of those which are intolerably sane, and they should be grateful for something to write about. Would it be very wicked to say these pictures suit them best?

And, indeed, it is only the superficial observer who never sees the use of the bizarre, the eccentric, and the out of the common. There is sometimes great wisdom in foolishness. Those who see deeper say, as Goethe said to Bettina, "You do not utter one word of sense, but your absurdities teach me more than all the wisdom of the Greeks."

I am reminded by the late Cheltenham Exhibition of another bogie. The particular bogie I am about to mention is of the most malignant kind, and makes all exhibitors shiver.

There are many good reasons why some photographers do not care to lend their pictures to exhibitions. They have little or nothing to gain; there is, it is true, the bare chance of a picture being sold, but this chance, if it comes off, seldom pays for carriage, for damage to frames, and other expenses; the quantity of classes and medals compel those, with any self-respect, to exhibit "not for competition." This is bad enough, but the bogie to which I want to draw attention is the carpenter fiend. Having had much experience of this gentleman, I now have a large label fixed inside the lid of my case, by way of a hint to the packer, to this effect:—

> IN RETURNING, PACK AS SENT.
>
> SCREWS ONLY TO BE USED.
>
> NO HAY, STRAW, OR PAPER RUBBISH TO BE EMPLOYED.

This seems to have irritated the Cheltenham bogie worse than usual, for, although my frames and case are made to pack almost automatically, and a small bit of wood fixes everything, the malignant demon stuffed the case full of dusty straw, which compelled me to send the pictures to the frame-maker to take out and clean, while instead of the necessary half-dozen screws, to fix the lid, a quantity of enormous wire nails were used, so that the cover had to be removed in fragments. Now, I have every reason to know that the Cheltenham, although its first, was one of the best managed of provincial exhibitions, and I have nothing but praise for the admirable Honorary Secretary, but I take great pleasure in anathematising the Cheltenham carpenter fiend, and hope that, when this thriving Society has another Exhibition, there will be some promise of a packer who knows his business. This, unfortunately, is not a singular or personal matter, and all exhibitors who have suffered loss will be glad to have attention called to it.

H. P. ROBINSON.

BY THE WAY.

IN what must be considered an incredibly short space of time the new science of radiography, as I suppose we must at present call Professor Röntgen's discovery, seems to be settling down into conditions of practical utility, and, though we must expect for some time to come a continuance of the sensational and exaggerated statements that are daily appearing in the "lay" press, there can be little reason to doubt that ere long it will be found to have taken up a fixed position of actual usefulness. In my last notes I alluded briefly to the first advertised "installation" of the necessary apparatus for the production of radiographs in a commercial way, that of Mr. Friese Green, and, though this, I think, rather aimed at satisfying the curiosity of scientific or pseudo-scientific *diletantte*, it is interesting to note that in the interim other gentlemen have taken

up the matter in a thoroughly businesslike way, with a view to bringing the benefit of the process within the range of practical surgery.

Naturally, in the course of time, we may expect further improvements in the working details of the method, more especially in the direction of more powerful and more reliable sources of the new power. At present the production and maintenance in working conditions of the vacuum tubes appear to present the chief difficulty, while the refusal of the new radiations to conform to the same laws as ordinary light rays in the way of refraction and reflection limits, to a very great extent, the degree of perfection obtainable in the results. In these directions, I repeat, we may in time find important advances made, but in the mean time we may also expect to find numerous experimenters in divergent channels, as, for instance, in the direction of altogether dispensing with the more elaborate items of apparatus involved in the production of the original "Röntgeographs."

Salvioni's cryptoscope seems to be the most important step up to now in the extension of the usefulness of Röntgen's discovery, for, although it requires to be used in conjunction with the more delicate apparatus for the production of the radiations, it displaces the photographic plate, and so does away with one of the uncertainties of the method, the estimation of the correct time of exposure. Naturally it gives no permanent record of observations, unless the camera be used in addition, in which case it becomes a complication; but, in the hands of a skilled observer, and especially for surgical purposes, and under conditions where the application of photography is difficult, or even impossible, it seems likely to afford a much wider scope of utility. For instance, in the operations of "probing" for objects buried in the tissues, or of examining or searching for defects in bone structure, the continuous ocular observation by means of the cryptoscope seems to offer far greater convenience than the making of successive "shadowgraphs," with the attendant expenditure of time and the uncertainty as to exposure; and, moreover, without doubt to the practised eye, the direct observations would have a greater significance than the shadows produced on the photographic plate, which must naturally vary in character with the exposure given.

Such experiments as those recorded by Mr. G. Scorah, at p. 175, are undoubtedly interesting, but they only differ in result from the original "radiography" in requiring a longer exposure, and presenting greater uncertainty in their production. But they certainly may be fairly taken as raising the question, propounded by your correspondent, Mr. F. W. Muncey, a fortnight ago, as to what may be considered as constituting a safe packing for sensitive films. There must, theoretically at least, be a limit to the opacity of every material to the passage of extremely powerful light rays, though, in practice, it is not difficult to keep within the bounds of safety. For instance, an ordinary dark slide may be perfectly safe, and so may a dark-room window in diffused light or with a comparatively slow plate, while either will break down completely in sunshine. The ordinary methods at present adopted by our plate-makers, in packing their sensitive films are, no doubt, quite efficient under ordinary conditions of storage; but it does not, under the revelations of recent science, look as if it would be a safe proceeding to leave a box of plates with all their wrappings on, for even a few minutes, in full sunshine.

I am not sure that I completely comprehend what is meant by those who claim that "shadowgraphs" can be produced in complete darkness—so called—*vide* Scorah's letter above referred to; but it seems to me that the claim is that all objects are endowed after exposure to light with some species of fluorescence, possessing penetrative powers greater than those of ordinary light rays and akin to the Röntgen radiations. If that is the case, it seems impossible that any mode of packing can be absolutely safe unless the materials used be stored in absolute darkness for a long period before use. I know in the earlier days of gelatine plates it was suggested that certain kinds of fog and markings were due to the fluorescence or phosphorescence of the packing paper employed, but I do not remember that the fact was ever actually established. I remember also a friend trying to demonstrate to myself and others the possibility of photographing—with a rather long exposure, of course—through a thin sheet of ebonite. But the mystery disappeared suddenly when one of the party, holding the ebonite close up to a gas flame, showed that it was *transparent* enough, not merely *translucent*, to show the shape of the flame with perfect distinctness.

Somewhat of the same nature is the effect alleged to have been obtained by Mr. Ingles Rogers with the retinal impression, produced by gazing long and fixedly at a postage stamp, and then placing a sensitive plate in the same position as occupied by the stamp. But, whether it is possible to so produce an image or not, the idea is not new, for I think it was Mr. Friese Green who some years back tried to demonstrate before the Photographic Society the fact that the retina, after exposure to a strong light, became luminous or retained for a time some of the luminosity absorbed. As it was reported to me, the lights having been extinguished in the room, the demonstrator submitted his own eye or eyes to the glare of burning magnesium, and then, facing the crowd in the dark, asked, "Can you see me?" As the only reply from one of the members present was "I can *smell* you," it would seem as if it must have been a case of *non est demonstrandum*.

Turning now to another matter referred to in my last notes which has elicited some correspondence since—the Artigue process or carbon printing without transfer—I will take M. Demachy's letter in your issue of 13th ult. I hasten to assure that gentleman that I am far from wishing to mislead the public in regard to the results obtainable by these methods, and I think I tried to make it clear that for certain purposes I fully recognise the possibility of getting good results. I will even go further, and say that, in careful hands and under the guiding spirit of an artist, I have little doubt really excellent results may be obtained, for what cannot be effected with perseverance, care, and a love for the work in hand? But, I must repeat, the perfect image can only be obtained by development from the back of the exposed tissue, and that in the same careful hands a better result would accrue, with less trouble with transfer than without. M. Demachy, I notice, in a second communication in last week's issue, draws a wide distinction between the bichromated gum and the Artigue processes, though he claims, as I take it, that equally good results can be produced by either. As my previous remarks had reference solely to processes on the principle of the former, and not to any such modified methods as that he attributes to the Artigue in his last letter, I will take them separately.

In the strictest sense I was perhaps wrong in likening the results to scene-painting, for that involves roughness, boldness, and, above all, contrast, whereas in a process based on the lines laid down by M. Demachy—"fine colours, thin coating, and smooth paper"—contrast and boldness are the two qualities above all others I should consider impossible, but in this place I should expect "*flatness*." In the first place there is not a sufficient body of colouring matter present to give contrast except between the deepest shadows, supposing the whole of the film to be rendered insoluble, and the highest lights, supposing it all to be removed or dissolved, while there is no theoretical explanation for the presence of any half-tones. The action of the light takes place from the surface downwards, and in an extremely thin layer, if the particles of colouring matter are "separate from, and not one on top of, another." As described by Mr. Maskell at page 156, that action will take place equally wherever it occurs at all, that is to say, the film will be rendered insoluble to the same depth in both shadows and half-tones. Even supposing the layer of colouring matter to be broken up into a semi-crystalline or granular form, as suggested in an article by Mr. W. B. Bolton last week, the granularity will be uniform in both shadows and half-tones, and, assuming the film to consist of a layer of single particles, there will be no distinction between the two. It is, however, impossible to suppose this to be the case practically, for the very existence of any gradation depends upon the film possessing an appreciable thickness that enables the light to act to different depths, and then we have to trust entirely to the skill and care of the operator to successfully remove the soluble portions from the porous film.

M. Demachy appears to labour under some misapprehension in his

allusion to the "harrowing details" of "every separate eyelash, and each individual freckle." These are not the details that present any difficulty in rendering—at least, from a theoretical point of view—since they present merely fine lines or specks of colour which can easily be left on a perfectly white ground from which every particle of the unacted-on film, has been removed. The difficulty will be found in the delicate rounding of a plump cheek or the ripple on a mass of golden hair, and to combine these with the necessary depth of deposit to form the shadows of a well-contrasted picture is where the bichromated gum process, as he refers to it, falls short of *any* transfer process. I remember being struck, many years ago, by a remarkably fine specimen of carbon work, or Woodburytype, I am not sure which, but it matters not, as they both recognise the principle of development from the back of the exposed tissue. It was from the studio of Reutlinger, and represented an actress in a handsome white moirée antique skirt, with lace and embroidered trimming, every marking or "harrowing detail" of which was most wonderfully rendered. The gum process without transfer would, no doubt, be able to cope with the lace and embroidery, but it would, I fear, prove hopelessly incapable of dealing with the delicate gradations of the moirée.

My recollection seems to have misled me, with regard to the late Mr. Pouncy's process having been used only for enlargements, but the specimens I have seen were all of large dimensions. I, however, accept Mr. Pouncy's correction, though I cannot help thinking that his comparison of such work, produced thirty-eight years ago, with modern platinotypes, from the same negatives, rather suggests that the negatives cannot be suitable for the modern process. His remark anent the deep blacks of the Pouncy prints being blacker than in the case of platinotypes is quite in agreement with my own view, for the weak point, or one of the weak points, of the early non-transfer processes was that, if they possessed any details in the lights, their shadows were, as my old friend, Traill Taylor, once described it, too "diabolically black."

With regard to M. Demachy's description of the supposed method of preparation of the Papier Artigue Velours there is far more reason to believe in the possibility of really first-class results from such a process than from bichromated gum. Here the colouring matter is *on the surface* of the bichromated vehicle, whether it be gum, gelatine, or fish glue, and it becomes more or less firmly attached to it in proportion to the action of light. A similar action is found in the ordinary dusting-on process, which is a non-transfer method in the sense that the picture is formed on the exposed surface. Here the longer the exposure the deeper its effects *in* the film of sensitive material; but the difference between the two is, that in the film containing no colouring matter its attraction of adhesiveness is gradually lessened, while in the Artigue film, with the colour already *in situ*, the cohesion is gradually increased, and so reverse results, though equally in gradation, are produced. Somewhat similar results were obtained thirty years ago by floating the back of ordinary albumen paper on bichromate of potash, drying and exposing albumen side to the negative, "dabbing" with printers' ink or dexterously washing with liquid Indian ink, and then developing in cold or tepid water. A moderate degree of half-tone was obtainable, but the difficulty was a "smudginess" in the lights and half-tones.

And now a last word to assure Mr. Alfred Maskell that I am far from wishing or intending to rank him with the ordinary run of "pinholists and fuzzytypers." Far from it. I have had the pleasure of meeting Mr. Maskell, and discussing with him the very subjects we are now "on," and found him always a very earnest and enthusiastic, if, from my point of view, slightly mistaken, gentleman. I have seen several of his productions that no one need be ashamed of, as well, I must admit, others that tended to prove his "mistakenness;" but the former class have gone far to reconcile me to the belief in the possibility of getting good results without transfer. I allude now to the gum process, already referred to and described by him in detail; the Artigue process, it seems, must come under another head altogether, if it be as described by M. Demachy. And I must corroborate Mr. Chapman Jones in his statement last week that he is not identical with, and has no connexion with, the individual who signs himself

DOGBERRY.

UNDER WHAT CONDITIONS ARE SILVER PRINTS LIABLE TO FADE?*

SULPHUR emanations are nearly always present in the atmosphere, be it as plain hydrogen sulphide or as more complex compounds. Therefore it is rather difficult to keep silver ware in bright condition. Imperfectly purified illuminating gas, burning coal, decaying matter, &c., are so many sources which bring sulphur into the atmosphere. The action of hydrogen sulphide on silver prints may probably be helped by the simultaneous presence of ammonia or humidity. All other conditions which favour chemical action hasten also the process of fading. Amongst these favourable conditions I should mention increase of temperature and extreme division of the reacting bodies.

The action of heat as an accelerator of chemical reactions is so well known that I can dispense with insisting long on this point. A great number of chemical reactions will not occur at a low temperature, but will proceed easily if the temperature is increased. The influence of the state of division is accepted by all students in chemistry. Where gases act upon solids, this action will be rendered more immediate and more complete if the solid has been reduced first to an impalpable powder. Where a solid piece of iron may last for centuries, even when exposed to damp air, this same quantity of iron in the shape of filings will degenerate quickly into a brown, rusty powder. Chemists know of a method of producing iron in a shape much more divided and much finer than the finest iron filings, so fine, indeed, that it could not be obtained by mechanical means. In this glass tube I have some such finely divided iron. You will notice that this glass tube has been closed by melting it at both ends. This precaution was absolutely necessary, because this divided iron is so susceptible to chemical changes that it would combine instantaneously with the oxygen of the air and undergo spontaneous ignition.

As soon as I break this tube and scatter its contents into the air you notice that each particle of iron becomes incandescent, and, by gathering some of the products on this white plate, you will notice that these particles have acquired a brownish colour, which is the colour of iron oxide.

This example will enable us to understand how silver, in a more or less divided state, will be more or less liable to undergo the action of chemicals, and specially of hydrogen sulphide. Let us add at once that the photographic image is made up of silver in an extreme state of division.

There are many substances which, although having absolutely the same chemical composition, can exist under two or more modifications of entirely different properties. There is an element, for instance, which is known under the name of phosphorus, and which enters as chief ingredient into the manufacture of lighting matches. This phosphorus is known under at least two different states, which are designated by chemists as allotropic modifications. Phosphorus, in its usual condition, is transparent, colourless or slightly yellow, brittle when cold, but soft at summer temperature, and it melts in hot water; it is a great poison, is soluble in carbon disulphide, and has such an extremely great affinity for oxygen that it enters quickly into spontaneous combustion when exposed to the air. That is the reason why it has to be preserved under water. Now, there is another allotropic state of phosphorus, which can be produced by certain methods. In this state phosphorus is red, hard, insoluble in carbon disulphide, not poisonous, it melts only at a relatively high temperature, and can be kept without the slightest danger, even in a dry condition, as it will only take fire at a relatively high temperature. It shows none of the strongly accentuated chemical properties of the white variety of phosphorus. Silver, just the same as phosphorus, can exist under several allotropic states. This explains why one kind of silver image may prove much more permanent—*i.e.*, much more resisting to chemical influences—than the other.

The silver precipitated by development in the image of a bromide print or a bromide plate is, then, in an entirely different condition from the silver in the image of a printing-out paper. If we examine the image of a bromide print or bromide negative under the microscope, we find that it is composed of a multitude of little silver particles, very distinct in shape and of measurable size. If, however, we examine, under the same magnifying power, the image of a printing-out silver paper, we fail to observe distinct silver particles. The whole image seems to be formed by such extremely thin particles of silver that they appear more as a homogeneous stain. I have some doubts whether the printed-out silver image can be compared at all to the image of a bromide print, or any other print obtained by development. Whereas we are sure that in a bromide print the image is formed by the juxtaposition of particles of

* Concluded from page 83.

pure precipitated silver, it is very probable that in printing-out papers the process of production is not so radical, and what is called commonly a "silver image," for albumen, gelatine, or collodion paper, is probably nothing more than a darkened organic silver compound, a product of partial decomposition of the original chloro-organic silver compound. Were this image the same as a bromide image, plain fixing in hypo ought to produce a print approaching a degree of permanency somewhat similar to that of a bromide print, and experience shows that this is not so. Even the process of gilding—*i.e.*, toning—does not succeed in making it as permanent as a bromide print. The natural conclusion is, that either the printed-out image is not pure silver, or, if it contains any metallic free silver, it exists there under a special allotropic modification which is so easily affected by chemicals that it is rather liable to fade. In a printing-out paper the image has so little resisting power that even water will act upon it. Indeed, it is a known fact that such silver prints, even when they are toned and fixed in separate baths, will be affected by water, and bleach out by-and-by if left washing too long.

Far more are they liable to undergo these changes if they are toned in combined baths, as can be readily proven by direct tests.

Why is this so? It is generally stated that the lack of permanency in combined-bath prints is due to the fact that the prints have become sulphurised, and that the silver has become sulphide of silver. If this was the only reason, I fail to see why bromide prints, toned in hypo-alum, and which have been integrally transformed into sulphide of silver, prove to be very permanent, and can easily compare in this respect with the best of prints made on albumen and toned with gold.

In a printed-out image the layer of silver is either so thin or in so delicate an allotropic condition that, in order to render it somewhat resisting, it has to receive a deposit of gold or platinum. By sulphurisation such an image can only be made still less resisting, and rendered more liable to further alteration or fading. In a bromide of silver print this is not to be feared so much, on account of the more resisting qualities of the silver therein.

It may be also that, in a printing-out paper, the sulphurised image is not pure sulphide of silver, but a sulphur organic compound of silver, more apt to change than would be, under some circumstances, pure sulphide of silver. In fact, we know that silver sulphide is a product which stands very well the action of chemical agents, and which can only be dissolved in some strong acids. In nature we find it as a mineral under the name of Argentite, and in this state atmospheric agents have no influence on it.

All this points out once more that there is a radical difference between a developed and a printed-out silver image. This is further corroborated by the fact that bromide prints can stand better small quantities of hypo which may remain accidentally in the fibre of the paper. As a rule, they are more refractory to chemical agents; they are not easily affected by hydrogen sulphide. A remarkable fact is that bromide prints may be permanent even when toned in a sulphurising mixture of hypo and alum. I wish to add here that different kinds of bromide emulsions behave very differently when exposed to the action of hypo-alum. Some such emulsions will tone in less than an hour, while others will require a day or more. I have observed that slow bromide papers tone much easier than quick bromide papers. By observing the "easy toning" papers under the microscope, I found that their images have very small particles of silver, while the slower toning ones show a coarser grain. Here is a very striking confirmation of what I said before in regard to the relation of the size of the silver particles and their relative permanency.

Coming back to the question of combined baths, I ought to say, in mentioning the evils referred to, that there is to be added another one, *i.e.*, the lead salts. These lead salts are added to the mixture in order to make sulphurisation more regular by a rather complicated chemical process. But the lead salt fastens itself in the tissue of the paper, and no amount of washing can remove the last traces of it. The ultimate result is that the whites of the print will darken by-and-by, because the lead salt, under the action of hydrogen sulphide, will produce lead sulphide, which is black or brown.

In regard to the vehicle which carries the print in a printing-out paper, I have come to the conclusion that it matters little whether it is gelatine, albumen, or collodion. Endless discussions are still going on as to which kind of prints is most permanent. It has been said and repeated that gelatine is not as staple a product as nitro-cellulose, which is the basis of collodion. To this can be readily answered that gelatine has proved beyond doubt to be a trustworthy medium, and will give permanent prints. Bromide prints, bromide plates, the carbon process, and the Woodburytype process have given it a record of reliability. We know, furthermore, that gelatine in a hardened condition withstands victoriously humidity and friction. A collodion print, on the contrary, is much more liable to abrasion. The film which carries the silver image is necessarily thinner, and the quantity of silver which can be introduced in a collodion emulsion is very limited as compared to a gelatine emulsion. A fair amount of silver is necessary to give body to the print, and if the print lacks in silver it will fade much quicker, even if it is toned with gold or platinum. I am not aware that since the introduction of collodion papers anybody has ever reminded us of the fact that, under certain conditions, nitro-cellulose is liable to undergo spontaneous decomposition. I am just now in possession of quite a large sample of nitro-cellulose, which was made for collodion paper purposes, and which was offered to me by a reliable firm; after keeping it a few months it showed already, in an unmistakable way, the presence of nitrous vapours. This spontaneous decomposition of some kinds of nitro-cellulose is a fact well known to many old photographers who made their own collodion. In how far this spontaneous decomposition of nitro-cellulose may occur in collodion prints has not yet been determined accurately. If it really occurs, the resulting nitrous gases would undoubtedly prove very destructive to the silver image, and help the fading thereof. Except in such an emergency as that above referred to, we can accept the conclusion that gelatine, albumen, or collodion, may all yield permanent prints if properly handled and toned in separate baths. A good thick image, rich in silver and toned to a deep purplish purple, with a fair amount of gold, will prove to have the best lasting qualities.

The fact that a printing-out paper requires little gold to be toned makes the permanency of such prints already questionable. Thorough fixing and washing should, of course, be adhered to. I must say, however, that there is a limit to the time of washing which should not be exceeded. When this limit has been reached, any further stay in water will only lower the quality of the prints. Any paper should be thoroughly washed in one hour provided the water is changed frequently and the prints kept moving all the time. The fading of combined-bath prints has often been ascribed to imperfect washing, and yet it is a noticeable fact that such prints will become worse and worse by being left too long in the water, especially if the water is warm.

Any perceptible amount of hypo, if left in printing-out papers, will quickly affect the image, and will destroy it by-and-by. Bromide prints are not so sensitive to traces of hypo. I know of one instance where a firm, in order to rush out its orders on bromide prints, had to limit the washing very much. The result was that a notable amount of hypo was left in the prints, so much, in fact, that by the tongue any one could easily detect a very pronounced hypo taste. These prints have been made now more than a year, and I must say that they have stood the test of time very well. I wish to add, however, that I should consider such imperfect washing rather reckless, even for bromide prints.

And, now, what is the easiest method of testing the relative permanency of prints? As said before, hydrogen sulphide in the atmosphere is the agent most destructive of silver prints. After more or less time its action will be more or less apparent. In order to find out how prints are going to behave, we may subject them to an atmosphere saturated with hydrogen sulphide, and accomplish in this way in one hour what otherwise would only be determined after a test of several years.

Hydrogen sulphide can easily be produced by pouring some acetic acid on a piece of potassium sulphuret. This latter chemical is well known to all photographers, who use it for precipitating their silver from their waste hypo.

The only drawback to this hydrogen sulphide method is the noxious smell of this gas. Therefore the test should be performed outdoors, where nobody will be incommoded by its disagreeable smell. I ought to guard you also against the possible danger of spoiling your silvered paper or dry plates by the emanation of this gas. Select a wooden box, relatively tight, and provided with a cover. Take all the prints which have to be compared, and have them all under the same conditions, *i.e.*, they should either be all mounted and burnished or not mounted at all. Cut each print in two, keep the upper half for future comparison, and place all the lower halves upright against the walls of the box. In the centre of the box place a tumbler with a piece of sulphuret in it about the size of a hickory nut, then pour some acetic acid on, and cover the box at once. Leave the prints in this box for about half an hour, and examine them from time to time.

This test will show that any combined-bath prints, whether collodion or gelatine, will bleach first; much later, albumen prints will start to fade, after which comes the turn of collodion or gelatine papers toned in separate baths. Bromide prints stand the test longest, and change very little.

DR. LEO BAEKELAND.

THE ANASTIGMATIC SYMMETRICAL APLANAT.

[Photographisches Archiv.]

Starting from the construction of the human eye, in which nature has created an anastigmatic, wide-angle aplanat, I hit upon the idea of constructing a lens perfectly free from chromatic and spherical aberration and distortion, by using only two refractive substances.

The Zeiss anastigmats, in which three to six lenses of great thickness are used, appear to me a step backward, instead of forward, on the true path of progress in lens construction, not only on account of their high price, but also from great loss of light.

Should it not be possible to attain, with only two refractive media, that which the new combinations, with their three, four, and six lenses, have but striven to approach? If we examine the eye more closely, we see, first of all, that it is composed of nearly similar refractive media and negative and positive lenses, which, as a whole, have very little chromatic aberration; and this, as well as the refraction, differs very little for the crystalline lens and the surrounding humours.

Why, then, employ heavy kinds of glass of high dispersion, that increase astigmatism, the greater the difference, N – n, between the mean refraction of the flint and crown glasses?

1. The use of media of low refraction and dispersion recommends itself as a first principle in imitation of nature and the construction of the eye, for the reason, that astigmatism is eliminated as much as possible.

Combine a low dispersive, for example a phosphate glass, with a more dispersive but lower refractive crown glass. A quartz lens combined with higher dispersive but weak refractive crown glass, also gives very good results. It is easy to perceive that such a double combination is not only anastigmatic, but apochromatic also, because the difference of relative dispersion is very small, and the chromatic aberration to be corrected is a minimum, as in the case of quartz and crown glass.

2. Take two lenses with a minimum of spherical aberration for distant objects, as for instance the plano-convex lens, the spherical aberration to be corrected by the second plano-concave lens is so small in amount that the combination of two plano contacts, one convergent and the other divergent, with their flat sides turned to each other, shows so little over-correction at an aperture of *f*·15 to *f*·20 that the lateral deviation scarcely exceeds an arc second, as may be proved by a simple calculation (*Comptes Rendus*, Feb. 19, 1894). Further reduction of aperture reduces the same to a quite imperceptible amount in relation to the third function of the diaphragm.

3. If the lenses are homofocal, that is, if the foci in both cases are the same, or nearly so, that the image produced by the plano-convex lens is bent to approximately the same extent as by the plano-concave lens placed behind it, the curvature of image at the focal plane of the symmetrical combination must, of course, be very small. The double combinations have absolutely no secondary spectrum, owing to very small difference of dispersion of the colourless media, and they give optically and actinically corrected images, which means that each pair of lenses may be used equally well for photography as for telescopic purposes, and there is a minimum loss of light. Such pairs of lenses, therefore, give images free from chemical difference of focus, as will a mirror.

The importance of these advantages for astro-photography and spectro-photography is apparent, and is increased by the perfectly flat field of about forty degrees.

But one may also combine two such lenses and obtain an aplanatic combination similar to Steinheil's, but of more extensive field for wide-angle pictures. I have repeatedly drawn attention to the importance of symmetrical lens systems for the construction of telescope and microscope objectives. I was also first to point out, in the year 1875, that the spherical aberration of reflectors could be corrected by a system of two homofocal lenses, that is, two lenses, positive and negative, of equal focus, made of the same glass. This without producing any chromatic aberration in the image, consequently without focal difference, and maybe with less distortion. In his anastigmats, Zeiss has recently made effective use of homofocal double lenses without focus. These, instead of a reflector, have a collecting lens corrected by two other lenses, which do not appreciably alter the focus, but they correct distortion and chromatic aberration, and, by reason of the kinds of glass, astigmatism also.

It is therefore possible to suitably correct all errors of the single lens, "chromatic and spherical aberration, distortion and astigmatism," with only two lenses (of two refractive media), by duly selecting the same, as in the human eye, according to form and substance, and it is even possible at the same time to attain a higher degree of apochromatism than with the best sorts of the new Jena glass. If, in addition, only light crown glass is used, the lens would be unaffected by atmospheric conditions.

Professor K. W. Zenger.

RONTGEN'S PHOTOGRAPHY OF THE INVISIBLE.*

Another peculiar effect of these rays has been investigated by Professor J. J. Thomson, and consists in the facility with which they discharge an insulated body charged with either positive or negative electricity. In fact, any substance, however good an insulator it may be under ordinary circumstances, seems to become a conductor of electricity during the time that the Röntgen rays are passing through it.

This can be shown experimentally by means of a gold-leaf electroscope such as I have here. This electroscope indicates the presence of an electric charge in the metallic disc on the upper part of the instrument by the divergence of the two gold leaves, which, when electrified similarly, repel one another. As you will observe when I charge the disc by means of a piece of rubbed glass or sealing-wax in the ordinary manner, the disc holds its charge fairly well. I will now allow the Röntgen rays from a Crookes' tube to fall upon the disc through an aluminium window cut in this lead screen. As you will see, the leaves immediately fall together, showing that the electric charge rapidly leaks away. As you will see, whether the disc be electrified negatively or positively, the result is the same. If, however, I close the window in the lead screen by means of a sheet of lead, you will now observe that the leakage is very much less rapid. The experiment, in fact, demonstrates the fact that lead is much more opaque to the Röntgen rays than is aluminium. Consequently this method can be applied even better than can photography to the exact determination of the opacity of various substances to these rays. It can also be used for the purpose of noting the intensity of rays that are generated by any particular Crookes' tube.

The best form of Crookes' tube to employ for practical photography of the invisible, or rather hidden, depends considerably upon the description of electric current that is available. When continuous or direct current obtained either from primary batteries, storage cells, or from the street mains can be used, and this current, which primarily is of comparatively low voltage, is transformed up to the necessary high voltage by means of an ordinary Ruhmkorff coil with its contact breaker, tubes of the form shown in the diagram on the wall will be found to give excellent results. In this description of tube the cathode consists of a plate of aluminium, and it will be found that the Röntgen rays proceed from the tube from a patch on the glass which is more vividly phosphorescent than the rest, which is immediately opposite the cathode plate. Where the anode is placed, it does not seem to greatly signify.

This is the form of tube, I believe, employed by Professor Röntgen himself; but during the last few days Messrs. Newton have placed on the market in London a new form of tube, which certainly gives very superior results. It was, I understand, designed at King's College. In it the cathode plate is made concave, so as to focus the cathode rays upon a point on a piece of platinum foil, which forms the anode. The platinum foil is bent at an angle of 45° to the direction of the cathode rays, so as to throw down the Röntgen rays, which in this tube proceed from the platinum, and not from the glass. This tube has two great advantages: firstly, as the Röntgen rays proceed practically from a point, it gives a sharpness of definition otherwise unattainable; further, since the cathode rays are directed on the platinum and not on to the glass, there is much less chance of the tube being destroyed by heating and cracking of the glass, and for this reason it is possible to excite the tube to a much higher extent, and consequently to work with shorter exposures than is practicable with any other tubes with which I am acquainted. In fact, from the point of view of the practical applications of Röntgen photography, it appears to me that this tube represents the most important advance yet made in connexion with the required apparatus.

When, however, direct currents are not available, and alternating currents must be used, an entirely different arrangement appears desirable. In this case, since each terminal of the tube is alternatively positive and negative, it is necessary that each must be capable of performing the functions of cathode. It is also necessary that the radiations should proceed from a single part of the glass, or otherwise the resulting photograph may be complicated by the production of double shadows. With alternating current, the form of tube shown in fig. 2, on the wall, in which one terminal is a circular plate and the other a concentric ring of aluminium, will be found suitable, and for the purpose of exciting such a tube the so-called high frequency arrangement of Tesla will be found very efficient. In this arrangement the alternating current, having been transformed up to, say, something like 20,000 volts, is employed to charge Leyden jars, which can discharge themselves across a spark gap, and are also connected to the primary of a second coil immersed in oil, to the secondary circuit of which the terminals of the tube are attached. The precise arrangement of the connexions is best seen by means of a diagram, which I will show in the lantern. So much for the form of the tube, but there are other points of the highest importance in connexion with its manufacture. First of all, it is necessary that the tube itself be constructed of what is known as German glass, that

* Continued from page 184.

is to say, glass in which soda is employed, and not lead, as is used in English glass. Further, the tube must be exhausted to an extremely high extent. What is exactly the best exhaustion is a matter of some uncertainty. The exhaustion can be too high, in which case it will not light up properly, but, in most of the tubes with which I have had myself to deal, it has been more often too low. In order to get really the best results with the shortest exposures, probably the best arrangement is to keep the tube connected all the time to a mercury pump, so that the amount of exhaustion can be increased or decreased to the exact extent that experiment shows to be advisable. This arrangement is perhaps the more necessary, for the reason that, though tubes may, when new, be exactly in the very best condition as regards exhaustion, it is unlikely that they will remain for long in this condition. In some cases the vacuum will become higher, and in some cases it will become lower with use. In the former case this is probably due either to absorption of the residual gas by the electrodes, or by condensation of the gas upon the glass, and, in the latter case, to some gas absorbed or occluded by the electrodes or condensed upon the glass being driven off by the heating that accompanies the passage of the electric discharge.

I will now show you a Tesla coil of the description mentioned, but of considerably large size than is necessary for merely exciting Crookes' tubes in operation. As will be observed, the nature of the electric discharge of such a coil differs very considerably from that produced by an ordinary Ruhmkorff coil, and, as you see, it will brilliantly light up Crookes' tubes connected to any one terminal, or even tubes with no terminals or connexions at all, that are merely held in its vicinity.

There can be no question that the Tesla-coil arrangement is very efficient for the purpose of producing the Röntgen rays from a Crookes' tube. It is, however, exceedingly destructive to the tubes themselves, and, though I am inclined to believe that with specially constructed tubes capable of resisting its action, a greater intensity of Röntgen rays are produced than with the ordinary Ruhmkorff coil, still, with such tubes as can at present be obtained, the latter is probably the more practical arrangement.

I now propose to actually take some photographs by the Röntgen method, and the results will be developed, and, if successful, will be shown to you in the lantern. We have here six photographic plates, of the commercial gelatino-bromide description. Each plate is enveloped in a double envelope of black paper, to protect it from ordinary light. We will place these photographic plates on the table, and upon them various objects, such as a purse containing coins, a pair of spectacles in their case, a pencil, &c. Above the objects, at a vertical distance of some eight or nine inches, we suspend the Crookes' tube. We will give an exposure of forty-five seconds.

We are using here, and I have always used, ordinary photographic plates coated with gelatino-bromide of silver. I do not think, however, that it at all necessarily follows that ordinary photographic plates which are made so as to be most sensitive to ordinary light, are the best for Röntgen photography. In any case it appears to me probable that the sensitiveness of photographic plates to these rays might very probably be largely increased by treating them with fluorescing substances, or even by arranging a fluorescent screen to be in contact with the film during the exposure.

At the beginning of this paper I mentioned how it was possible to render visible to the eye the invisible ultra violet-rays of the spectrum. It is interesting that, by a similar method, it is possible to render visible the Röntgen rays, and thereby actually to see the shadows cast by those rays of hidden objects, and even of the bones within the living body. Lenard was the first, I believe, to discover that it was possible to produce luminescence in phosphorescent substances outside a Crookes' tube. Röntgen investigated the subject further, and states in his paper that, by means of a fluorescent screen, formed of paper impregnated with platino-cyanide of barium, it was possible to make visible to the eye the shadows cast by the bones in a human hand.

More recently, Prof. Salvioni, of Perugia, has described an instrument which takes advantage of this phenomenon, and which consists of a card-board tube, at one end of which is an aperture to which the eye is applied, the other end being furnished with a screen made opaque to ordinary light, and coated on its inner side with phosphorescent material. I have such an instrument here, and by its means I have been able to see distinctly the shadows not only of coins in purses, of metallic objects in wooden boxes, and through aluminium plates, but even with considerable distinctness the bones in the thicker portion of my own hand. The method of using the instrument is very simple. The eye is applied at one end of the tube and fixed upon the fluorescent screen in the interior, while against the back of the latter is placed the purse, hand, or other object to be observed. On the other side of this object is the Crookes' tube, so that the rays cast the shadows of the objects upon the screen. This fluoresces more or less according as the rays are free to pass or are intercepted, with the result that a visible image is formed upon the screen. This instrument at present is very imperfect, but it seems capable of considerable improvement. For surgical and medical purposes it would indeed be an advantage if the bones and interior organs of the body could be inspected without the necessity of tedious photographic processes. Even in its present shape, however, the instrument is useful, for the reason, that by its means it is possible at once to determine whether a tube is working satisfactorily, whether it is giving a sufficient intensity of rays, and whether the shadows cast by it are sharp. It will also show that the glass, when fatigued, does not transmit the Röntgen rays.

Professor Röntgen's discovery is undoubtedly one of very considerable importance. It has excited the popular imagination in a manner unknown since the days of the telephone and microphone. Already, though it is but a few weeks old, the discovery is bearing fruit, in that it is being daily applied in practical surgery, more especially for the purpose of locating needles, bullets, and other extraneous objects which have become embedded in the flesh. On its further improvement it can scarcely fail to become still more valuable, as there seems every prospect by its means of being able to determine the extent of calcareous deposits in the interior organs of the body, malformations and diseases of the bone, &c. It may, in time, be possible to photograph, or even—and this would be still more useful—to actually see the interior organs in operation; and it is scarcely necessary to point out the extreme advantage that this would have, not only for the purpose of determining and curing the ills to which flesh is heir, but also in investigating and understanding many of the obscure processes which take place within the body.

Further, as we have seen, the discovery is of extreme interest from a point of view of physical science, giving as it does fresh insight to many matters of the highest scientific importance. It is not many years since Lord Kelvin stated that the discoveries of Hertz had annexed the whole science of optics to the domain of electricity, and the labours of Röntgen and Lenard have advanced us yet another step towards a knowledge of the real nature of both luminous and electrical activities. It is by slow degrees that the mists which obscure the panorama of the universe are dissipated, but the prospect surely widens year by year.

Discussion.

Mr. Brooks said, in March 1877 he made a communication in that room to the South London Photographic Society with regard to non-luminous actinic rays, but he had no electric appliances, and used a horse-shoe magnet. By exposing plates in complete darkness to the action of the magnetic field he obtained certain images, and found that even outside that there were invisible rays by which he could photograph through blackened cards, as had been shown that evening; but, when he brought this subject forward, it was pooh-poohed, and so he let it drop. He should now renew his experiments, especially as he had seen some things now which explained what he could not then understand. He found that the rays he used were not due to magnetism, although associated with it; and he also found he could even get rays from the fingers. In those days wet plates were universal, and a friend of his asked him for some chemicals and a bath to prepare some plates; he gave them to him, but next day his friend said they were useless, for every plate fogged. He himself then excited a plate, and exposed it, and found it perfectly clear, and so he came to the conclusion that there was some effect due to his friend's personality, and he proved this to be the case, for the placing of his friend's hand on the back of a plate was enough to fog it. In those days there were no pneumatic holders, and each plate had to be held by the corner, and, on investigating the matter, he found that in, about two or three per cent. of cases, rays were given off from the tips of the fingers which shoot out two or three inches.

The Chairman proposed a cordial vote of thanks to Mr. Swinton for the interesting and almost epoch-making paper he had read. He had done a real service to science in bringing before the general public the remarkable results that Professor Röntgen had obtained so shortly after their discovery. The more the public were interested in scientific matters of a genuine kind, the more secure would be the future of England. There might be material isolation, but there was no possibility in the future of intellectual isolation. Consequently, a scientific discovery of such great importance as this, which had awakened public interest in every country in the world, was something to be really thankful for. It was stimulating to the cultivation of real science to have a brilliant discovery like

his (probably the most remarkable which had been made within the last half-century, seeing that it had been rendered practically useful within less than three months of its publication), generally appreciated. They could see no end to the future work in abstract science which it opened up. It had, at the same time, stimulated a kind of criticism to which, perhaps, Mr. Swinton would be exposed, but which, in his opinion, ought not to be entertained. That was the view that a scientific discoverer had some kind of monopoly for an indefinite period of time in his discovery, and that his position was similar to that of an inventor. He should not have been surprised if this view, which had recently been promulgated in the scientific journals, had led to a kind of injunction being asked against their friend. He could not understand that position. There was no monopoly in science, and he felt convinced, though he had not the honour of knowing Professor Röntgen himself, that he would not regard this widespread interest in his work as in any way detracting from his merits, but rather as adding new laurels to the value of the original investigation. He was sure Mr. Swinton would be the last man to do anything else than exhibit the marvellous fertility of Röntgen's discovery. To say that any investigator, if he locked the door of his laboratory and cultivated his own garden—as had been suggested—for a permissible period, could have done as much in three months as had been done in this case through publicity, would be simple nonsense. He could not but think that such ideas rather suggested that, instead of having regard to the real objects of science, there was too much consideration being given to the personality of the investigator. Now, the merits of the investigator had often very little to do with the importance of the discovery. That was one reason why there could be no such thing as monopoly. Look at the antecedent work involved in Professor Röntgen's discovery. On the one side you had the heredity from Faraday, who first suggested lines of force, to the great development made by Maxwell, to the work of Varley, and to that of Crookes. On the other hand, you had the work of Herz, Lenard, and the work of Professor Röntgen. There were three Germans who had cultivated this field, and at least four Englishmen who had done admirable work. We, therefore, had our own share in the development of Röntgen's discovery, and every step had been necessary to the ultimate achievement. Of course, they always felt that somebody else might have discovered something, and that it was a pity he missed it; but really one man could not expect to monopolise everything, and there was plenty yet to be found out. You had only to go over the most elaborate investigation of the most brilliant man before you, and you would be sure to find something he had not seen, something the world ought to know. As regards the theory of the X rays, he noticed that Mr. Swinton was much in the position of other investigators—he declined to commit himself. He had put several suggestions before them, and they must select the one which seemed to them most suitable. Probably Professor Röntgen was well advised in calling them the X rays. The problem still awaited solution, but probably within a year they would know more about it. If not, it certainly would not be for want of minds all over the world best able to deal with these abstruse problems being concentrated upon it. They could not but feel that they were on the dawn of new knowledge with regard to the most recondite and most interesting of all kinds of substance, viz., the material medium called ether. That was really, they believed, what they were now touching, and that, after all, was the most widespread medium or material in the universe, connecting world to world, the stellar system and the nebulæ to our earth, and yet, at the same time, the means of communication between atom and atom. This discovery seemed to open out a new mode of attacking the ether, and to show a new and striking use to which this medium can be put. First light, then electricity, and now a new kind of radiation, which it would take years of labour to investigate, had been in succession added to the functions of the ether. But, at any rate, the brilliancy of this discovery would remain, and their thanks were due to Mr. Swinton for the admirable way in which he had brought it before them.

A. A. C. Swinton, A.M.I.C.E., M.I.E.E.

ON A NEW METHOD OF PREPARING PLATES SENSITIVE TO THE ULTRA-VIOLET RAYS.*

[Communicated by Colonel J. Waterhouse, I.S.C.]

I.—Preliminary Preparation of the Plate for Coating with Silver Bromide.

If plates prepared as above† are treated with hypo, the greater part of the developed picture flows away as soon as the remainder of the yellow ground of the plate forming the unexposed parts disappears. This defect may be prevented by:—

(*a*) Preparing the silver bromide film very thin.

(*b*) Coating the glass plate with some binding material before depositing the silver bromide.

(*c*) Mixing the bromide itself with a binding material.

(a) With a thick film the developed picture rests upon a layer of unaltered silver bromide, and by the fixing this is replaced by an equally thick layer of fluid, which causes the picture to be suspended close over the glass. If the tray is moved, the film forming the picture is broken up, and floats off. With a thin coating the greater part of the image is reduced all through the film. The fixing solution then acts more on the sides of the reduced silver than underneath it, so that the undermined parts of the film remain fast to the glass along with the other parts, and are prevented from being washed away. But the use of silver bromide without a binding material is not to be recommended. Even with a proper thickness of film, the plates require the greatest care after fixing.

In cases when the employment of a binding material is not permissible (as when it is desired to ascertain the behaviour of the spectrum with pure silver haloid), it is better not to fix at all. In darkness the plates can be preserved unchanged in colour for a long time. If the plate must under any circumstances be fixed, then it is better to employ a gelatine bath first. This also gives the finished plate more resistance. The fixed image from a thin film of pure silver haloid on plain glass has no strength, and is very sensitive to mechanical pressure.

(b) If the glass plate to be sensitised is first coated with gelatine, then even a thick film of pure silver bromide holds so strongly, that the fixing with hypo does it no injury.

For this substratum I use a warm two per cent. solution of gelatine, which is liberally poured on to the carefully cleaned and warmed plate, and allowed to flow over it and run off at one corner. The plate is then stood up to dry, in a place free from dust, on blotting-paper, with the prepared side inwards, and coated soon afterwards with the silver bromide.

The coating of silver bromide is very sensitive to irregularities in the gelatine coating—particles of dust, burst air bubbles and inequalities in the coating, spoil the deposition of the silver bromide and give rise to a number of defects in the plates, which in most cases do not appear till the development. The coating with gelatine must therefore be done with the greatest care. Above all, air bubbles must be avoided. Even the smallest bubbles burst, and, where they are, the surface of the glass is exposed, and this, in certain cases which will be referred to later, in consequence of the insensitiveness of the silver bromide deposited upon it, becomes uncovered on the developed plate all round them.

The gelatine coating should be as thin as possible. The thinner it is, so much the less will the almost unavoidable differences in its thickness affect the silver bromide film; the stronger the image sticks to the glass, the less stained becomes the gelatine in the developer. Another advantage to be noted, especially with very small plates, is that, as the plates must be cut from the prepared side, the cutting can be done much more neatly and exactly through the film in proportion as the gelatine is thinner. (The plates cannot be cut from the back on account of the tenderness of the film of bromide.)

(c) If the bromide of silver is itself mixed with a binding material, then the substratum of gelatine is unnecessary. This can be done in a suitable way by precipitating the silver bromide from solutions containing gelatine. In this case the particles of bromide, as is well known, contain gelatine, and, as I first of all observed, hold extremely firmly when applied on glass and dried.

The proportion of gelatine in my silver bromide solution varied between 1 : 18,000 and 1 : 1550. Its influence on the sensitiveness of the plates will be considered later.

It should, however, be mentioned at once, that for reasons, which will be explained hereafter, I now use the gelatine substratum for all plates, even when the silver bromide contains gelatine.

II.—Preparation of the Silver Bromide.

(*a*) *Without Gelatine.*—To prepare silver bromide as a fine precipitate, settling itself gradually, requires very strongly diluted solutions and a large excess of potassium bromide. I dissolve 2·8 grammes of potassium bromide in 4 litres of distilled water, and 2·0 grammes of silver nitrate in 100 c.c. of distilled water, and in the light of the dark room pour the silver solution in small quantities into the bromide solution, constantly stirring the while. The liquid so obtained is tolerably translucid and coloured red by transmitted light, and after filtering is ready for the precipitation of the silver bromide. In this case I do not use the whole of the silver bromide, but content myself with what falls in one or two

* Translated from the *Sitzungsbericht der Kaiserlichen Akademie der Wissenschaften, Math-Naturwiss. Classe*, Band cii. Heft. 8, Wien, October, 1893, pp 994-1024.

† The British Journal of Photography, January 31, 1896.

days. To wait till the fluid over the plate is quite clear would take weeks.

The liquid with the precipitate becomes visibly denser as soon as ammonia is added. The bromide also settles much quicker than before, and ten to twelve hours will be sufficient. For this purpose I add 30 c. c. of ammonia to the above solution.

(*b*) *With Gelatine.*—To the solution of potassium bromide given above I add 0·2 gramme of hard emulsion gelatine, dissolved by heat, and otherwise proceed as before. Ammonia also acts beneficially on the formation and settlement of the silver bromide precipitate.

All these methods yield a silver bromide which is only slightly sensitive even when prepared with warm solutions. Greater sensitiveness was obtained by prolonged heating of the suspended silver bromide. The strongly diluted solutions are not well adapted for this, and better results can be obtained with an emulsion weak in gelatine. If this is dissolved in proper quantity in hot water, the silver bromide precipitates gradually. It also contains gelatine, but gives a more sensitive coating than bromide, which is deposited from very dilute solutions.

The emulsion I use for this is composed as follows :—

A.

Potassium bromide	12 grammes.
Emulsion gelatine	2 ,,
Distilled water	200 c. c.

B.

Silver nitrate	15 grammes.
Distilled water	200 c. c.

A is dissolved with heat, and B, also warmed, is poured in very gradually in small quantities in the light of the dark room. During the mixing, A must be kept well stirred.

The unripened emulsion can be used at once for precipitating, but the plates are then scarcely more sensitive than in the former method. Greater sensitiveness must be obtained by warming or boiling the emulsion, adding ammonia or other means usually employed with sensitive gelatine emulsions as laid down in the text-books. The only precaution to be taken during the ripening is to keep the emulsion well shaken, as, owing to the small quantity of gelatine, a good deal of the bromide will settle to the bottom. 100 c. c. of this emulsion, dissolved in 4 litres of water, shaken up and filtered several times, give a good precipitating fluid. It is well to allow the solution to stand a few hours before use, in order to allow the heavier particles of dust and other impurities which may go through the filter to settle, so that at least the heaviest of them may be kept off the plate. By this precaution the formation of a number of small defects on the plate, even if they may be almost microscopic, is avoided.

The silver bromide can also be obtained from ordinary gelatine dry plates, though the emulsions are of different degrees of richness in gelatine. The emulsion is dissolved in a suitable quantity of hot water, and the further procedure is as before. These plates also have great sensitiveness for the ultra-violet rays. My observations with them have, however, not extended beyond w. l. 170$\mu\mu$. I have no doubt, however, that these plates would be useful beyond that point,

The employment of ordinary dry plates can only be considered when it is desired to prepare plates sensitive to the ultra-violet with the least expenditure of time, trouble, and costs. When it is a matter of only a few experiments, or perhaps it is merely desired to ascertain the behaviour of the new plates, it is better to take the silver bromide from the coating of commercial plates. For this purpose a plate of this kind is cut into slips 1 or 2 cm. wide, which are placed in a flask full of hot water (0·5 to 0·6 litre to a plate 13×18 cm.), and well shaken. As soon as the coating of emulsion has dissolved, the contents of the flask are filtered, allowed to stand quietly for about an hour, and then poured into the precipitating dish, in which a second dry plate has been laid with the coated side upwards.

VICTOR SCHUMANN.

(*To be continued.*)

THE W. H. HARRISON FUND APPEAL.

	£	s.	d.
Contributions acknowledged last week	18	19	0
Vaughan Pendred, Esq.	2	2	0
James B. Spurge, Esq....	1	1	0
F. W. Payne, Esq.	1	1	0
From a friend	1	0	0
	£24	3	0

Further contributions will be thankfully acknowledged by

FREDK. H. VARLEY, 82, *Newington Green-road.*

Our Editorial Table.

TYLAR'S P. O. P. WASHER.

W. Tylar, 41, High-street, Aston.

THE features of this handy little washer are—(1) The inlet is so placed that a circular motion is given to the prints, and (2) The position of the outlet prevents overflow. Once the water is turned on,



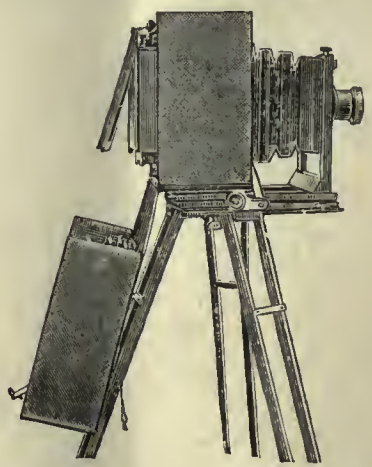
the washing proceeds neatly and automatically. The P. O. P. Washer is a thoroughly useful and efficacious addition to the amateur's outfit. When using it, Mr. Tylar recommends that the prints be put in one after the other. "They can then be left, providing no boys are about."

THE ALBION COMPANY'S NOVELTIES IN PHOTOGRAPHIC APPARATUS.

The Albion Albumenising Company, 96, Bath-street, Glasgow.

THIS well-known northern house is issuing several novelties in photographic apparatus, which are likely to appeal, not without success, to the sympathies of amateur photographers.

THE AYE-READY CAMERA.—This camera, which embodies every necessary movement, has the further advantage of being complete in its own case. It will be seen from the illustration that, attached to



the base board of the camera, is a portion of the case in which the camera itself may be packed, and that contains the dark slides. Space is given for other items of apparatus, such as the lens, &c. The camera, when not required for use, packs up into a neat case, and is therefore virtually self-contained.

THE "REPEATER" CHANGING BOX.—The features of this changing box are that an unlimited number of plates can be changed in full daylight. Plates or films may be exposed at will. There is no



heavy box on the camera, as the plates or films are manipulated in a slide one at a time. The envelopes used for carrying the plates before and during exposure can also be used for storing them.

In use, the plates are placed in the light-tight envelopes in the dark room, and sealed. They can then be handled in daylight without fear of fogging. Each plate is placed in the slide singly, and the tag attached to the roller fitting, which, when the shutter is drawn, pulls off the front of the envelope and exposes the plate. After exposure the slide is removed from the camera, and the plate dropped into a special box. To accomplish this, the slide is attached to the box, and the shutters of the slide and box are drawn together. Inside the changing box is a cardboard box, which holds twelve plates; when filled, this can be removed in full daylight and another substituted, and so on indefinitely.



The Inquirer.

**** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

COLOUR SCREENS FOR ORTHOCHROMATIC WORK (To C. P. R.).—Pure chromate of potash was specified, not the red dichromate or acid salt. C. P. R. correctly describes it as of a lemon yellow colour, having great tinctorial power; this pale colour in conjunction with its power of intercepting the blue and violet rays makes it so eminently suitable for the purpose, giving better results with shorter exposures than any other colouring matter I have tried. Some workers recommend that the aqueous solution should be rendered slightly alkaline with carbonate of potash; but I have not found this necessary. In making the solution distilled water should always be used. C. P. R. should make his experiments in glass tubes, so as to judge his solutions by transmitted light, not by reflected light in the way described; he is, however, substantially correct in his deductions of the tinctorial powers of the two salts in dilute solution.

F. H. BURTON.

News and Notes.

PHOTOGRAPHIC CLUB.—Wednesday next, April 8, Members' Open Night.

THE General Meeting of the King's Lynn Y.M.C.A. Photographic Club was held in the Society's rooms on Monday, March 16, Mr. C. W. Perry in the chair. The following are the appointments for the coming year:—*Chairman of Committee:* Mr. J. O. Reynolds.—*Committee:* Messrs. Bridges, Johnson, and Smyth, and Mesdames Andrews, Reynolds, and Ramsell.—*Treasurer:* Mr. E. H. Andrews.—*Secretaries:* Messrs. F. Hampton and W. M. Lock.

Patent News.

THE following applications for Patents were made between March 18 and March 25, 1896:—

BURNISHING MACHINE.—No. 5789. "An Improved Rotary Burnishiug Machine for Photographic Purposes." T. S. HARGREAVES.

CAMERAS.—No. 5928. "Improvements in Photographic Cameras." Complete Specification. Communicated by the Automatic Camera Club, United States. H. H. LAKE.

EMULSIONS.—No. 5992. "Improvements in Photographic Emulsions." H. WANDROWSKY.

STANDS.—No. 6075. "Improvements in Stands for Photographic and other Apparatus." Complete Specification. Communicated by C. Chorreticr. B. J. B. MILLS.

MOUNTS.—No. 6145. "Improvements in Photographic Mountings." J. F. HOYNE and D. B. ATHOL.

LENS DIAPHRAGMS.—No. 6421. "Diaphragm System for Lenses used in the Half-tone Photo-engraving Process." A. W. PENROSE and W. GAMBLE.

VIEWING PHOTOGRAPHS.—No. 6245. "A Method of and Apparatus for Taking and Viewing Photographic Pictures." M. FREUDENBERG.

RECORDING EXPOSURES.—No. 6277. "Improvements in Recording the Exposure of Photographic Plates and other Subjects." E. MOSELY.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
6.....	Hackney	Excursion: West Drayton. Leader, A. Dean.
7.....	Darwen	*Tour in Switzerland.* G. Butterworth.
7.....	Hackney	Open Night.
8.....	Croydon Camera Club	*Anti-halation and Latitude in Dry Plates.* J. T. Sandell.
8.....	Photographic Club	Members' Open Night.
8.....	South London	Annual Meeting.
9.....	Bradford	Members' Slides.
9.....	Leeds Camera Club.....	Prize Slides.
9.....	Liverpool Amateur.....	Demonstration on Enlarged Negatives. Paul Lange.
9.....	Woolwich Photo. Society	*Uranium Toning.* Messrs. Cricks and Harwood.
10.....	Ireland	*The Engadine.* V. E. Smyth.
10.....	Moseley and District	*Miscellaneous.* Walter Griffith.
10.....	West London.....	*Some Industrial Applications of Photography.* Donald McBeth.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 26,—Mr. E. H. Bayston in the chair.

Mr. W. H. Smith was elected a member.

The following question was read: "From whom can a permit to photograph at the Zoo be obtained?" Application to the Secretary of the Society was recommended by Mr. Freshwater, although he thought a permit was not necessary.

THE BACKING OF PLATES.

Mr. R. P. DRAGE, in connexion with the statement that as good work can be done on unbacked plates as on backed plates, said he had recently seen a collection of slides of Lincoln Cathedral by Mr. Evans, who had told him that he never used any backing, and in only one of the whole series was there any trace of halation.

The HON. SECRETARY said one could get a very good slide indeed from a weak negative, and, if the ultimate object was only to obtain a slide, the halation might be avoided by purposely making a weak negative.

Mr. T. E. FRESHWATER had seen platinotype prints of the photographs in question, and said they were not from thin negatives, which, he thought, moreover, did not lend themselves to this printing process.

Mr. A. HADDON could not see how, by tentative development, one could avoid bringing up halation, and did not think development could be made selective.

The HON. SECRETARY inquired the necessary outlay for the plant involved in slide-making by the Woodbury process.

Mr. ATKINS said it was somewhat expensive on account of the press, and estimated it at about 50*l.*

The HON. SECRETARY again brought the Traill Taylor Memorial Fund before the members, and passed round a subscription list.

Slides by Messrs. Freshwater, Kellow, Drage, and others, were shown on the screen, including some by the Woodbury process.

PHOTOGRAPHIC CLUB.

MARCH 25,—Mr. John Nesbit occupied the chair.

Mr. FRED H. EVANS gave an excellent lecture on

LINCOLN CATHEDRAL,

illustrated by about 100 lantern slides. The lecture was most interesting, and the pictures among the best architectural photographs we have ever seen. Mr. Evans informed his hearers that some were taken on plates and some on films, but in neither case were they backed, the excellence of the pictures being mainly due to full exposure and a suitable time being chosen for taking them.

After a very hearty vote of thanks to Mr. Evans, a series of slides were exhibited, kindly lent by Messrs. R. W. Thomas & Co., from negatives taken on their anti-halation plates.

Camera Club.—It is abundantly evident that a great satisfaction is attached to the examination of one's osseous structure, otherwise it would be difficult to account for the circumstance that two large congregations of sane beings have recently assembled at the Camera Club in order that their hands, feet, elbows, wrists, ankles, &c., might be portrayed *à la* Röntgen. The operator in each case has been Mr. H. Powles, a member of the Club, and one of the leading spirits at the Electrical Standardising, Testing, and Training Institute at Faraday House, close by. On the first occasion Mr. Powles had no fewer than twenty-five patients, or, perhaps we should say, models, who were anxious to see the bony structure of their extremities, or to trace the effects of old wounds, or the presence of foreign bodies. Before the discovery of Röntgen's method of exhibiting the bones, people kept their slight injuries and the maimed condition of their limbs to themselves as strictly private matters, but now they are only too proud to exhibit their defects. A broken ankle, which will show well with a Crookes' tube, is regarded as quite an enviable possession, and if one can only show a bullet or even a few leaden pellets which have entered his leg instead of the more fortunate bunny at which they were aimed, he at once advances a long way in the estimation of his fellows, so that Mr. Powles had no need of interesting subjects for dissection by the far-seeing Röntgen rays. Indeed, the members of his Club, like Oliver Twist, asked for more, and therefore a second *séance* was arranged, which came off with great *éclat* on Wednesday last week. Mr. Powles did not attempt to give a lecture it was rather a demonstration, or series of demon-

strations, in which the company present took an active part. One had a wounded hand, another a dilapidated foot, while a third had a knee full of shot, each stepping forward in turn to be operated upon by the Surgeon-in-chief, Mr. Powles, who sat at a table, upon which were two powerful induction coils, which buzzed away like swarming bees. The only notable difference in the apparatus employed on this occasion and that used by Mr. Campbell Swinton in the same room some weeks ago, was in the pattern of the Crookes' tube. Mr. Swinton had the disadvantage of being the pioneer worker of the Röntgen process in this country, and had to make use of such appliances as were ready to his hand. Mr. Powles, coming later into the field, has been able to reap the experience of others, and employs a radiant-matter focus tube of the pattern adopted by Mr. Herbert Jackson, of King's College, which has been generally accepted as a very great improvement upon older patterns. With a tube of this kind, Professor Owen Lodge, at Liverpool, has viewed, with the help of a fluorescent screen, the internal structure of a boy, and has seen through a mass of timber twelve inches in thickness. We are under the impression that the fine life-sized photograph of an infant, published last Friday as a supplement to the *British Medical Journal*, was also due to this modification of the Crookes' tube. It seems certain that, to obtain the best effects, the time of exposure should not be curtailed too closely. Mr. Powles gave an average for hands and feet of about six minutes, and with such an exposure development came up rapidly. For some occult reason, hydroquinone seems to give better results than pyro for this particular work.

Hackney Photographic Society.—March 24, Mr. R. Beckett presiding.—Mr. Dean announced the arrangements for the Easter Monday club outing to West Drayton, train to leave Bishop's-road or Paddington at 9.34 a.m. A paper on Enlarging by Mr. John A. Hodges was, owing to his unavoidable absence, read by Mr. W. Rawlings. All the details of the subject were clearly and exhaustively treated, and the paper was much appreciated by those present.

North Middlesex Photographic Society.—March 23.—Mr. A. J. Johnson gave a lecture on

Photography and Book Illustration.

Close upon a hundred lantern slides were thrown on the screen of wood engravings, half-tone work, and other methods in use for illustrating books and periodicals. As the slides were shown, he described the picture and method by which the result was obtained. Some very early examples of wood engraving and facsimile work were shown, also some specimens of American work, and the more modern "process." He explained the part photography took in these methods, and showed the nature of the grain produced by the screen by exhibiting part of a picture on a much enlarged scale.

Richmond Camera Club.—March 23, Mr. Alabaster in the chair.—Mr. Ardaseer gave a

Chat on Photographic Chemicals,

which was of great practical interest. After mentioning the foreign matter pervading our Richmond water, and rendering it without treatment unsuitable for photographic purposes, Mr. Ardaseer treated in detail of all the chemicals in ordinary use by photographers. He described first the developers, of which he mentioned seven. Secondly, preservatives: sulphite of soda (which commonly required the addition of sulphurous acid to produce neutrality), metabisulphite of potassium (better than sulphite, as being an acid salt), nitric acid (not good, being a powerful oxidiser), sulphuric acid (the best of the mineral acids), citric acid (not advisable owing to liability to form citrate of soda, a powerful restrainer). Thirdly, alkalies: liquid ammonia (of which one never could be sure of the strength), carbonate of soda (in using which an extra amount of sulphite should be used in the developer), carbonate of potassium, caustic soda, carbonate of ammonia, and bromide of ammonia, potass, and soda (the last being rarely used, though cheaper and apparently equally efficacious). Fourthly, ferrous oxalate developer for bromide paper, recommending that, for the preservation of ferrous sulphate in solution, it should be made strongly acid with sulphuric acid, and some scraps of thin iron wire placed in the bottle. Fifthly, fixing baths: hypo and cyanide of potassium. Sixthly, toning agents: gold chloride (which ought not to cost less than 1*s.* 8*d.* per fifteen grains, the cheaper stuff being part chloride of gold and part chloride of sodium or common salt), chloro-platinite of potassium, ammon-sulphocyanide, acetate and phosphate of soda, and borax. Seventhly, miscellaneous chemicals: alcohol, ether, nitrate of silver (the mode of saving which from old hypo baths was explained), alum (common and chrome), and pyroxyline. Mr. Ardaseer clearly explained the nature and properties of the various substances, dropped hints in lavish profusion as he went along, and concluded his "chat" by answering a number of questions.

Tooting Camera Club.—March 25.—Mr. Edwards demonstrated the use of

Cresco-fylma,

and imparted some very useful information to the members. The comparative ease with which he cut a blurred head from the negative of a group, replacing it by a better one extracted from another negative of the same group, was a revelation to most of those present. The experiments made in respect to enlarging of films and their transference to larger glass plates were very successfully carried out and watched with the greatest interest, and led to the suggestion that it would be a grand thing to soak the Club itself in cresco-fylma.

Liverpool Amateur Photographic Association.—March 26, the President (Mr. J. Sirett Brown) in the chair.—Messrs. A. H. Baird, Charles H. Hughes, G. R. Clarke, and G. P. Mulock, were elected members. Dr. J. W. Ellis read a few notes on the methods proposed to be adopted in carrying out a photographic survey of South-west Lancashire, after which Mr. Charles L. Burdick (of London) demonstrated the working of the Aerograph (or Fountain Air-brush), finishing with a very clever sketch of the President.

Oxford Camera Club.—March 23.—A demonstration of the

Photo-autocopyist

was given by Mr. Taylor, Manager of the Autocopyist Company of London. There was a large attendance. The process gives a ready means of obtaining a number of prints in any colour and of absolute permanence, their appearance resembling collotype. A gelatine film on suitable support is sensitised in a solution of bichromate of potash and dried in the dark, when it is ready to be exposed under the negative. The progress of printing can be seen as with ordinary print-out processes, so removing any element of uncertainty. When sufficiently printed, the sheet is washed from bichromate, stretched in a special frame, and inked with an ordinary printing-ink roller. The ink only adheres where the light has acted, and the sheet is then covered with the material to be printed on, and pressed in an ordinary copying press for a moment, when the print is finished. Several hundred prints can be made from the one gelatine sheet. The process was fully demonstrated by Mr. Taylor, and the results caused surprise at their refinement and the ease with which they were produced. Several sets of apparatus were ordered by members, and the process will be largely used in Oxford.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

ORTHOCHROMATIC PHOTOGRAPHY.

To the Editors.

Gentlemen,—There are two small errors in your report of my demonstration at the Royal Photographic Society, on Tuesday. I did not tell Mr. Bolas that an exposure of from two to four times that required with "an" orthochromatic plate would, with an ordinary plate and a suitable screen, yield a fairly satisfactory result. I may have said, "with *one* orthochromatic plate," but the figures are correctly given in another part of your report. I also stated that Mr. Senior's photographs of the painting were made on *ordinary* plates, one of them with the bichromate tank, as originally recommended by me for use with chlorophyl plates. "Chromium green" light was not recommended for the development of orthochromatic plates generally, but only for the Cadett "Spectrum" and the Lumière series B.—I am, yours, &c.,

F. E. Ives.

24, *Southwick-street, Hyde Park, W., March* 27, 1896.

PHOTO-CHROMOSCOPES.

To the Editors.

Gentlemen,—Having now obtained a copy of M. Nachet's patent and "certificate of addition," I find that the facts are exactly as I suggested on p. 142. There is not the remotest suggestion of my apparatus in his patent of 1894; but, in his "certificate of addition," filed nearly six months after my application for a French patent and the publication of my United States patent (nearly a year after my legal date of record for both countries), he has inserted an exact drawing of my instrument, and claims for the same.

A careful examination of references that have already been given will suffice to completely refute the latest batch of "arguments" directed against my claims to original methods. I shall, therefore, no further encroach upon your space, except to ask for a reproduction of drawings of the various photo-chromoscopes discussed, with brief descriptions and patent dates, which are all to the point, and state the case as to invention of apparatus better than a mountain of words.

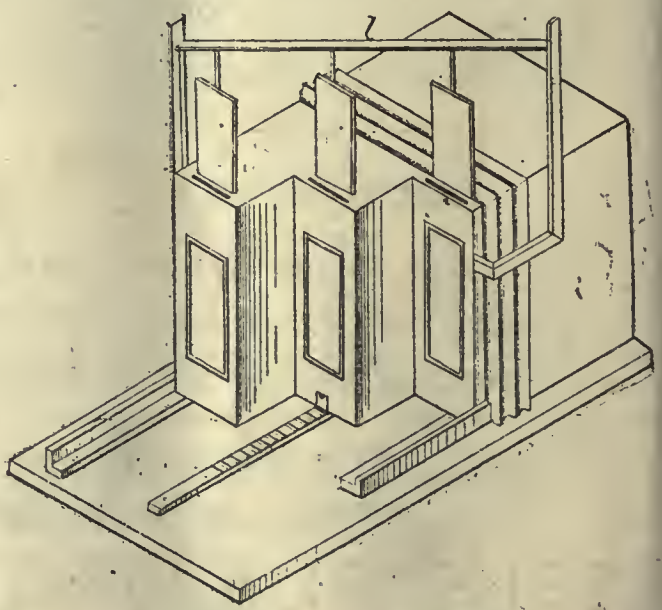


Photo-chromoscope of A. H. Cros, British patent No. 9012, May 30, 1889. Contained a revolving disc with mirrors and open sections, arranged to blend

the images by persistence of vision. Disc revolved by pulling a cord wound on the axle. A practical failure. Abandoned.

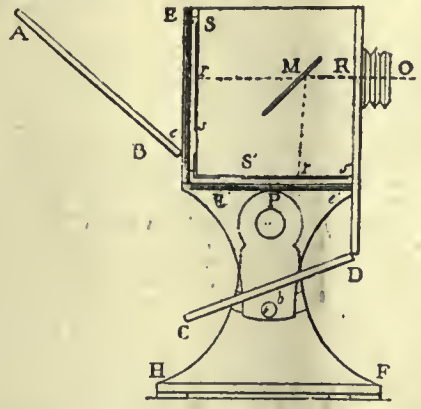


Photo-chromoscope of C. Nachet, French patent No. 237,394, March 29, 1894. Two images blended for one eye by viewing one image directly through a transparent platinised mirror, and the other by reflection from the same; the third image seen directly by the other eye. Neither a true photo-chromoscope nor a true stereoscope, but a hybrid device.

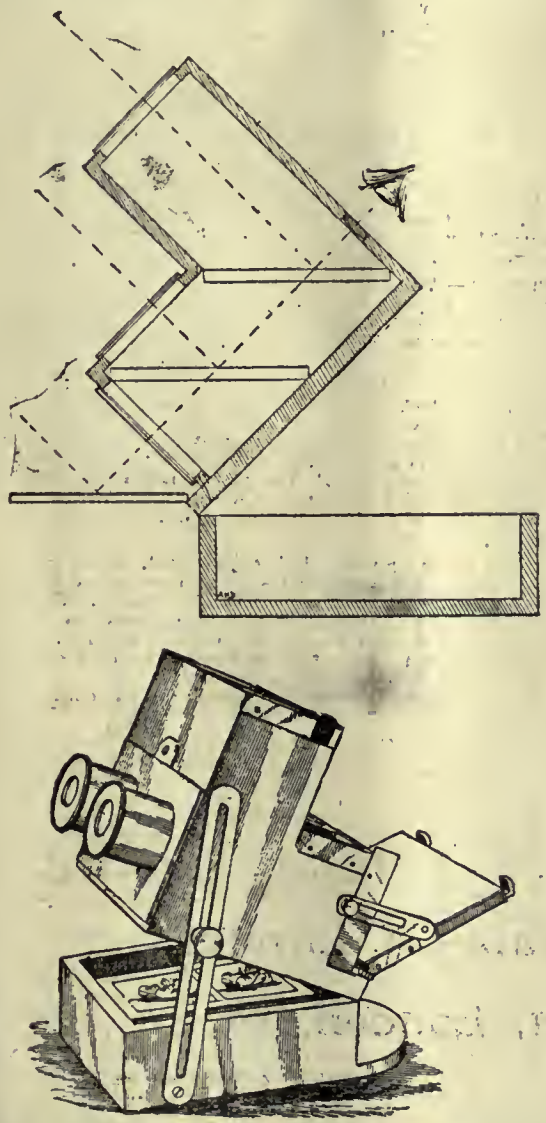
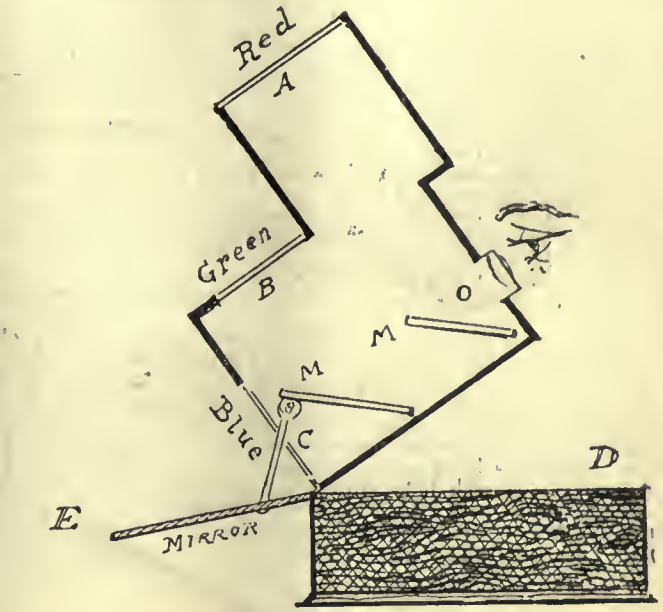
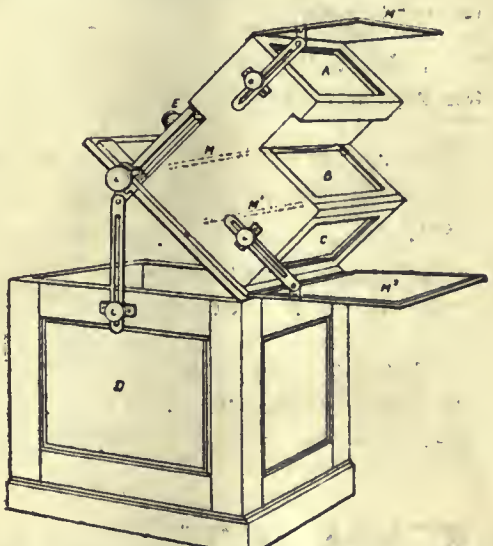


Photo-chromoscope of F. E. Ives, British patent, legal date July 3, 1894; issued as No. 2305, 1895. Same legal date in United States and France. Original features, patented, as follows: 1. Step form with steps horizontally disposed, and mirrors inclined in a horizontal plane. 2. Contraction to two-step arrangement, making the instrument simpler and more compact, and greatly increasing the angle of view and the apparent area of the image. 3. Hinged attachment to baseboard or tray, for regulating angle of inclination. 4. Stereoscopic arrangement. 5. Stereoscopic colour record consisting of three pairs of images. 6, Folding chromogram, by which all three sections are as readily placed and registered as a single section in Cros's unsuccessful instrument. Completely successful.



Leon Vidal's drawing of instrument claimed by C. Nachet, by patent "certificate of addition," dated June 7, 1895. Should be compared with Ives's instrument and claims dating July 3, 1894.



Claimed by B. J. Edwards, British patent No. 3613, February 19, 1895, but horizontal disposition of steps not shown until December 19, 1895. Should also be compared with Ives's instrument and claims dating July 3, 1894.—

I am, yours, &c.,

F. E. IVES.

24, *Southwick-street, Hyde Park, London, W., March* 28, 1896.

[This correspondence here terminates.—EDS.]

ORTHOCHROMATIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Is it possible, after all that has been said, written, and demonstrated, notably by Mr. Ives, and supported by many other practical workers, there still remains a doubt that orthochromatic results can be obtained with ordinary or non-colour sensitised plates, and that it is in any way necessary to debate the matter theoretically to prove a fact which every worker of average intelligence can determine for himself? Theory is all very well in its way, but, when it does not conform to

practice, it must stand on one side until it gets into a more intelligent frame of mind. Academical discussions on a matter of this kind are not conclusive, so much depends on the special ability of some men to state a case, while others holding perhaps sounder views are unable to express themselves with clearness and decision.

Will those who doubt set up a coloured chart of the spectrum in their studios, and make a few negatives of it in good white daylight, using as screen a cell containing a one per cent. solution of chromate of potash and giving an exposure of ten times the normal without screen? If they don't succeed at the first attempt, they will at least secure a much improved colour rendering which will encourage them to further experiments and ultimate success; it is really so simple there is no need to sigh for an English Dr. Eder to conduct the operation.

To any one who has studied orthochromatic photography three points are abundantly clear:—

1st, that orthochromatic plates in a white light without screen have no advantage over the ordinary plate.

2nd, that orthochromatic plates with screen or yellow light give excellent colour values with moderate increase of exposure as compared with using them in white light without screen.

3rd, that ordinary plates with suitable screen will give as good colour values as orthochromatic plates, but require considerable increase of exposure.

This increase of exposure will probably prevent the extended use of ordinary plates for orthochromatic work; no ordinary plate will even give a better result than one specially sensitised for the purpose, and it is absurd to think that where in the ordinary plate all the results are due to the action of the screen, at a loss of speed, it will give better results than the orthochromatic plate which meets the screen more than half way and greatly reduces the exposure.

Ordinary plates will yield orthochromatic results under suitable conditions, but they will not supersede those specially sensitised for the purpose; loss of time so often means loss of subject.—I am, yours, &c.,

Roundhay, near Leeds, March 23, 1896. F. H. BURTON.

FOREIGN EXHIBITIONS.

To the EDITORS.

GENTLEMEN,—Kindly permit me to announce that I have been appointed British representative for the Lille (France) Exhibition. The exact dates have been altered as follows: Entries close May 20, pictures must reach me by June 8, and the Exhibition opens on June 27. Artistic merit alone will be recognised, no charge for space, no awards, but each accepted exhibitor receives a commemorative plaque.

For the Harlem (Holland) Exhibition I can receive entry forms up to the end of this week, April 4.

For both the above Exhibitions all details, forms, &c., may be obtained from me, and entries and pictures must be sent to my office. The latter will be forwarded in a joint case or cases and the carriage divided equitably.

Exhibitors at Brussels can have their work sent on direct to Harlem if they so advise me.

The delay with the Amsterdam medals is, I believe, due to unfortunate circumstances connected with one of the officials of that Exhibition, who has left Amsterdam altogether. Nevertheless, I think they will all be received shortly. The last advice, dated 24th inst., says that they have been sent out, and the writer adds, "I expected to cross to England some time ago, and intended taking the medals with me in order to reduce the expenses, but I have been detained."—I am, yours, &c.,

WALTER D. WELFORD.

15, *Farringdon-avenue, London, E.C.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Harry S. Parsons, 15, Upper Gray-street, Edinburgh.—*Photograph of dogs and cat, named Chums.*

R. C. Whitehouse, 59, Piccadilly, Manchester.—*Photograph of John Henry Tyers with swimming trophies.*

R. G. Ashton, 27, Booth-street East, C.-on-M., Manchester.—*Photograph of Mrs. Jane Franklin, Mr. Duke Franklin, and a servant in front of the shop.*

RESIDUES.—C. G. & CO. The metals can be precipitated by sulphide of potassium—liver of sulphur.

COLLODIO-CHLORIDE.—WET PLATE. We are sorry we cannot assist you further. It is a matter that you will have to work out by experimenting yourself. That you should be able to do with the information already supplied.

COLLODION.—S. WALTON. Methylated ether will do quite well for collodion for the wet process, but commercial methylated alcohol will not. The latter will do for collodion for enamelling and anchlike purposes if it is of not less than sp. gr. ·820 or ·825, and free from the mineral naphtha.

RELATIVE RAPIDITY.—C. B. asks: "Will you kindly inform me what is the difference in the quickness of a Dallmeyer's 3D and a Dallmeyer's half-plate portrait? By so doing you will greatly oblige."—Supposing the portrait lens is of the A series, it will have nearly double the rapidity of those of the D series.

HYPOSULPHITE OF SODA IN PRINTS.—F. M. Make a *very* dilute solution of permanganate of potash in water so as to just give a pale tint. Then suspend a print, as it is taken from the washing water, till a final drop has collected at the corner. Let this drop into a little of the permanganate solution in a small test tube, and, if its tint is discharged, the print contains hypo.

STUDIO.—W. & CO. By all means adopt design No. 3 for general portraiture, in preference to any of the others. That form of studio is by far the easiest to work, and will fulfil every requirement. The No. 2 should be specially avoided, more particularly with the only aspect available to you, as it would be next to impossible to obtain satisfactory chiaroscuro in it when the sun is shining.

CHONDRIN.—EXPERIMENTALIST writes: "Where can I obtain some pure chondrin?"—We cannot say, as it is not an article of commerce. Chondrin is gelatine made from cartilage, and many gelatines contain it in considerable quantity; but we do not know that chondrin has really been chemically separated from gelatine, as different authorities give different formulæ as to its constituents, the same as they do for gelatine.

PAINTERS' CANVAS.—E. J. WALKER. We are unable to give the practical details of the preparation of artists' canvases. It is work we should scarcely advise a novice to undertake if the durability of the paintings put upon them is to be of any value. Ready-prepared canvas is supplied by the artists' colourmen in rolls at a very moderate price—probably for less than it can be prepared at home if time is of value.

LENS, TEST FOR.—C. JAMES. We must refer you to one or other of the works on Optics, say, the late Mr. J. T. Taylor's *Photographic Optics*. It would take up far more space than this column can afford to give instructions for testing lenses. We may, however, give you a practical hint. Take a negative or two of such subjects as you require the lens for, and judge from them if it is, or is not, equal to your requirements.

PHOTOGRAVURE.—B. S. WARDLE. As the Talbot patents were taken out nearly forty years ago, they expired many years since. Consequently you, or any one else, are at perfectly liberty to work either, or both, of his processes in their entirety, and without devising modifications to "get round the patents." The modern modifications of the Talbot methods, we may tell you, are not restricted by patents, their workers simply keep the working details of them, as they employ them, as trade secrets.

ALBUMEN ON GLASS.—STEREO. It is quite correct, as you say, that it is claimed for transparencies by the albumen process that they have never been surpassed, and the claim can well be sustained. The reason why the albumen process is not worked more by amateurs is that it is a process that involves considerable trouble in working, as well as considerable skill to obtain the best results. Even if the plates could be purchased ready for use, the same as gelatine ones can be, they would be but little used, as the development is quite different from that modern amateurs are familiar with.

UNMOUNTING PRINTS.—C. BARRETT says: "I have had some prints sent me to take off their mounts (rough cardboard) and remount them on others with a margin. I have soaked two of them in water for six hours, and they stick as fast as ever. I do not know what they were mounted with, and cannot learn. Can you suggest any way by which they can be got off?"—Most likely the prints were mounted with glue, or gelatine, in which case they should be soaked for some hours in cold water, and then transferred to warm water, when they will come off easily. If that fails, the mounts must be stripped off sheet by sheet, and the last one carefully rubbed off with the finger.

BUILDING.—PHOTIC-ART writes: "In laying down the bricks, &c., forming the foundation of a studio or glass house, what is the consequence in making the piers of bricks, placed upon each other with or without mortar or other binding material, so far as the landlord is concerned? I have been informed that, if mortar is used, the landlord of the property or land it is fixed upon can lay claim to the work, and defy you to remove any part of the whole structure built thereon; but that, if no mortar be used, you may remove the whole concern whenever you desire to do so. Is this so or not?"—We are not certain on the point, but we know that nurserymen's greenhouses are looked upon as trade fixtures, and they may remove them, but a private individual may not. We believe that, when a nurseryman removes a greenhouse, he leaves the brickwork upon which it has stood. Better consult a solicitor on the subject, or make an agreement with the landlord that you can remove the building at the expiration of the tenancy.

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EX CATHEDRÂ.

Mr. E. H. Fitch, whose name has so long been identified with the manufacture of celluloid films, informs us that he has succeeded in taking photographs by the X rays (now no longer "X" rays if we are to trust the evidence of the report we reproduce in the following paragraph) in one second. He also informs us that he has perfected a new screen for direct vision purposes.

* * *

The London Correspondent of the *Daily News* states that Professor Winkelmann and Dr. Straubel, of the University of Jena, have succeeded in discovering a new method of photographing with Röntgen rays, by which the length of exposure is reduced to only a few seconds. "The method is based on a conversion of the X rays into rays of other undulations, by means of fluor spar crystal. If the Röntgen rays are allowed to fall upon a plate, the sensitised film of which is turned away from them, and covered with fluor spar, the rays, after passing the film, will be absorbed by the fluor spar, and there undergo the modification spoken of. The new rays now act upon the plate, and indeed much more strongly than did the Röntgen rays on passing through. As large fluor spar plates are to be had with difficulty, powder of the same crystal was tried in their place, and, as this succeeded, nothing stands in the way of the further application of the method. The new rays emitted by the fluor spar were minutely examined by the discoverers. They succeeded in determining their refrangibility, and from this the length of the undulations. The rays lie far beyond the ultra-violet end of the visible spectrum."

* * *

Among those who have been working hard with the New Photography is the versatile Mr. W. I. Chadwick, of Manchester, who has submitted to us several excellent specimens of his radiographical productions. We are gratified to find that our article of February 28, giving directions how to proceed about taking electrographs, as well as our advice to photographers to engage in this branch of work, has been of distinct service to many of our readers.

* * *

In sending us a print of the finish of the Inter-Varsity Boat Race, Mr. F. Gage, of Nottingham, remarks: "Just an untoned print sent you in a hurry, as I thought you would like to see it. Conditions so bad, I don't think there can be many photographs taken; but it is not bad, considering it was raining at the time. It is the tenth race I have done. If you measure boats, it is exactly two-fifths Oxford has won by. Good old Fenner judged very accurately. It was a glorious race. I was standing in water when I took it, and during the hailstorm was almost inclined to throw it up, but, although I got drenched, I think I am fairly rewarded."

* * *

Mr. Gage did very well, under the difficult conditions in which he had to work, the photograph being fairly well exposed and the view of the boats indicating their relative positions with sufficient exactness to enable every one to be able to check back the Judge's verdict. May we assume that in the not far distant future, photography, in athletic and other contests, will supersede the distance Judge, and will automatically and exactly record what is now, under the best of circumstances, largely matter of guesswork?

* * *

Messrs. Taylor, Taylor, & Hobson inform us that Cooke lenses, Series V., *f*-8 of 9 in. focus for 8 × 5 plates, and 11 in.

focus for $8\frac{1}{2} \times 6\frac{1}{2}$ plates, are now on the market. They also state that they have removed their London office to more convenient premises at Faraday House, 8 and 10 Charing Cross-road, W.C.

* * *

A WELL-KNOWN professional photographer, writing over the signature "One of the Crowd," sends us the following suggestion with reference to the provision, by the makers of gelatino-chloride papers, of those popular printing surfaces in various cut sizes. The suggestion has more than once been made already, and was not favourably received, but we again give it place, because, possibly on grounds of economy to the photographer, there is something to be said in favour of it.

* * *

"As a practical photographer of some thirty years' experience and constant user of this valuable recent addition to our printing processes (P.O.P.), might I be allowed to suggest to the makers of same the extremely advantageous improvement it would be were they to make a cut cabinet size $4 \times 5\frac{1}{2}$ inches, instead of (or in addition to) the size already listed ($6 \times 4\frac{1}{4}$), as, in my own practice, and, doubtless, that of most other professionals, this latter size is *no saving of time whatever*, having always to trim the paper on all sides to adapt it to the shape of the ordinary commercial cabinet mounts. It may meet the requirements of the amateur, but certainly not so the professional photographer, and an exact cut size in cabinets, &c., or to meet *his* requirements and fit *his* mounts, would, I venture to think, prove a boon and a blessing to most of us. I would also suggest the *dating* of sealed tubes of P.O.P., that the age of it may be known at a glance."

DIRECT HALF-TONE NEGATIVES WITH THE SCREEN.

SINCE that far distant date when, in October 1852, the late Henry Fox Talbot patented the first crude idea of what is now called the screen, vast changes and improvements have been effected, not only in the methods of using screens of various kinds, but also in their manufacture. In the patent alluded to, mention is made of "photographic veils," by means of which the "effect of engraved lines or of universal shading" was sought to be produced, and to attain this result "the image of a piece of folded gauze, or other suitable material," was impressed upon the plate prior to the formation of the photographic image.

It is noteworthy, in connexion with this, the earliest use of a screen, that it was applied to the plate previously to the production of the image of the object to be copied—noteworthy because quite recently that method has been revived, and made the subject of a patent as an improvement upon the now generally practised plan of forming the image of the screen and the subject to be copied simultaneously.

During the period that has elapsed since the date of Fox Talbot's patent, the changes have been rung very considerably on the screen method of translating continuous half-tone. Woodbury was the first, we believe, in comparatively recent times to resort to that system, his method being to use the photographed image of a piece of fine gauze netting; but, though fairly promising results were thus obtainable in an experimental way, the effect was in no way comparable with modern screen work. The first really practicable process in which the screen was employed was the secret one of Meisenbach, if we are not mistaken, and finely ruled lines for copying into screens soon became recognised articles of commerce, and these gradually developed into the diamond ruled screens of the present day, which, in point of perfection, it is almost impossible to expect to excel.

Before this degree of perfection had been attained, and before the true principle of the use of the screen had been recognised, numberless variations had been resorted to in the method of use in order to secure a, to some extent, selective grain; that is to say, a grain which differed in its fineness in different parts of the negative, according to the extent of the action of light. Thus, a part of the exposure was made without any screen at all, and then successive exposures were subsequently made, using the screen in different positions so as to obtain a result free from the excessive sharpness or "screeniness" given with the fixed position. Sometimes the screen was used simultaneously with the formation of the image of the subject to be copied, sometimes prior to or subsequent to its formation; sometimes a single-lined, sometimes a cross-ruled, screen was employed; in fact, almost every operator had his own individual plan of working.

It was not, however, until within the last very few years that the principle of the screen as at present employed began to be studied, and still more recently to be thoroughly understood; and even at the present time, judging by the different opinions expressed, it seems to be open to doubt still whether the diffraction, the pinhole image, or the vignetted theory, is the correct one. It is true that amongst the upholders of the diffraction theory are some of the most practical men of the present day, including Mr. Max Levy, to whom we are indebted for the perfection of our modern screens; but, although diffraction undoubtedly forms a most powerful factor in modifying the character of the dot obtainable on the photographic plate, it is still questionable whether its influence is very great under actual working conditions. A careful examination of Max Levy's examples of undoubted diffraction and of actual negatives used in half-tone printing will go far to strengthen this doubt, whereas the pinhole-image theory fits in almost completely with all the effects obtained in real practice under any of the working conditions of stop, screen distance, and camera extension.

But there is such a strong tendency, nowadays, to resort to complications in the shape of irregular and multiple apertured stops, that it is quite impossible to say how much of the effect is due to diffraction and how much to the combined influence of screen and stop; and it is almost equally difficult to work out, except by accident, almost the proper working conditions for any combination of circumstances. We were irresistibly led to this conclusion on perusing carefully a very elaborate paper, with diagrams, on the theory of the screen, by Mr. E. Deville, Surveyor General for Canada, who has given a vast amount of attention to this difficult subject. But, setting aside all the complications in connexion with different forms of stop and of "cross-line," or "chess-board" screens, we could not help being struck by his summary of the use of the vignetted screen. He says: "In theory, the vignetted screen is the most perfect one for photo-mechanical process, because correct prints can be obtained, from either thin or intense transparencies, by using thin or intense screens." And, again: "This method is unfortunately restricted to dry plates, otherwise it would be the best of the three." As to its being, in some respects, theoretically the best form of screen, we are quite at one with Mr.

Deville, though, in practice, we do not think it need be restricted to use with dry plates.

A vignetted screen, with any degree of "softening" that may be required, is very easily produced by any one possessing at the same time a diamond-ruled cross-line screen and the necessary skill to produce a collodion reproduction. It is simply a question of arranging size and shape of stop—which may be matters of individual taste—in conjunction with proper screen distance and camera extension, and exposing with the screen in position as for making a half-tone negative, only substituting a plain white, evenly illuminated surface for the subject to be copied. The result will be a screen, to use Mr. Deville's words, divided into minute zones of varying degrees of opacity.

Now, if, instead of making this screen on an unexposed plate, we substitute one, either wet or dry, that has been exposed in the camera in the ordinary way, but for a shorter time than would be the case for an ordinary negative—on, in fact, an under-exposed camera negative—the subsequent exposure through the screen will form a combination half-tone negative, in which the auxiliary exposure will, at one and the same time, make up for the under-timing of the first, and also supply the screen effect. By reason of the vignette effect in the screen exposure, the dots will vary in size in proportion to the amount of light action in the exposure on the subject itself, and so an identical, if not a more perfect, result will be obtained.

Mr. Willlam Gamble, at the close of an interesting article in our number for March 13, says: "Hardly anything has been done in the use of the screen for photographing from life and from still objects. There is an immense field here, and it is not an impossible one to develop, but it will not be by existing methods." Here is a suggestion, or perhaps we may say "more than a suggestion," which scarcely requires more working out than the careful adjustment of the various exposures, and which entirely does away with the retarding action of the screen in exposures in the ordinary manner.

Science Popularised.—Evidently the tastes of the British public are becoming very different from what they were a few years back. Then the general public took but little interest in scientific matters, or at least included them in their frivolities. Clearly the case is different now, as we find two of the latest things that science has given us figuring at music halls. At one, demonstrations have been given of the Röntgen X rays; and at some others the Cinematograph is made a leading feature of in the programmes, and it seems to be highly appreciated by the audiences, if one can judge from the applause it receives.

A New Property of the Cathode Rays.—At the last meeting of the Paris Academy of Sciences M. Gouy mentioned a peculiarity of the cathodo rays not hitherto observed by any one. Heating with a blowpipe a Crookes' tube which had been used a long time, he stated that the glass took the appearance of ground glass, arising from the development of a large number of imperceptible bubbles of gas. If the heating was continued, there were seen on the interior of the body of the glass little bubbles, formed by the union of those of more minute size. In the same way, glass, which has been exposed to an intense cathodic discharge, disengages bubbles of gas.

Permeability of Bodies to Different Radiations.—At the same sitting M. Becquerel gave an account of the relative penetrating power of the radiations from phosphorescing substances and the Röntgen rays. Using photographic plates and an electrometer, he obtained entirely concordant results. He said, in a general way, that bodies were more transparent to phosphorescent than Röntgen rays. Thus, platinum and copper, which are but slightly permeable to the latter, are very easily traversed by the former. Quartz, quite opaque to Röntgen rays, is transparent to phosphorescent radiations. Indeed, a layer of pounded glass is more transparent to the latter than pieces of clear glass of equal thickness. It is noticeable that powdered glass, by reason of the irregular internal reflections, is quite opaque to ordinary light.

Very little appears to have been done in this country with phosphorescent rays, and it is quite possible that these discoveries of M. Becquerel may to some extent explain some of the anomalous effects obtained by British workers at various times.

Amusing.—One of our evening contemporaries has a column devoted to queries, to be answered by any one who cares to write in reply. Those that from time to time appear in connexion with photography are frequently highly amusing, and so too are the replies that are generally given. Here is a query that appeared one day last week. "*Photography.*—What is the best and cheapest way to develop an ordinary negative?" Here is another that appeared on the following day: "Will any reader oblige with advice about how to start as an amateur photographer? Would an outfit be expensive? Is a dark room necessary? What appliances are really required? What are the cardinal rules of photography?" Possibly replies have been given ere this, but we have not had the opportunity of seeing them.

Sunday Opening of Museums, &c.—On Sunday last, the South Kensington Museum—including the Indian collections—and the Bethnal Green Museum were thrown open to the public from two in the afternoon till dusk. They will be open now every Sunday, as will shortly be the British Museum, the Natural History Museum, the National Gallery, and the National Portrait Gallery. These privileges are what one section of the public have been contending for many years past, and what have been as strenuously opposed by another section. However, the House of Commons, by a large majority, recently enacted that they should be opened. It now remains to be seen how the general public will appreciate the acquisition. Anyhow, photographic *employés*, and others whose avocations prevent them on other days, will now have the opportunity of seeing, and studying, the works in our national collections—both science and art.

Amateur Photographers as Patentees.—It has always been, and is still, a vexed question as to what constitutes an amateur photographer—where does the amateur end and the professional begin? Out of the large number of photographic patents applied for during the year, it is surprising how comparatively few are by professional photographers and apparatus-manufacturers. The larger proportion are taken out by amateurs. It is curious to note the callings of the various photographic patentees, such as "Clerk in Holy Orders," "Doctor of Medicine," "Architect," "Gentleman," &c. By the way, the last-named designation figures more frequently than any of the others. Last week the specification of a dark slide was published. The patentee is described as "———, M.A., F.R.G.S., Gentleman." Now, what is the object of patenting a thing but, presumably, to make money out of it, otherwise the expense would not be gone to? At one time, amateurs were only too pleased to give the world the benefit of any invention or improvement they might make, either in processes or apparatus. It seems now, however, that any little improvement—real or imaginary—however trifling, that the modern amateur may make is made the subject of a patent, with the idea of turning it to a monetary account.

A Simple Barometer.—Those of our readers desirous of paying some attention to weather changes, yet not caring to go to the expense of a barometer, may construct a substitute of fair

efficiency in the shape of what has long been known as a water-glass barometer. If an ordinary boiling flask with a long neck (the old-fashioned oil flask, usually termed a Florence flask, will suffice) has a small quantity of water poured in and then inverted, and the neck made to dip below the surface of a vessel of water, the whole arrangement will form a weather glass, giving approximately indications of changes in atmospheric pressure. The water in the flask will partly fill the neck, and its height will vary according to the pressure of the atmosphere. It is, of course, subject to temperature variations, and so should be kept out of direct sunlight.

An instrument of more scientific precision is actually made for sale by the scientific-instrument makers; it is termed a sympiesometer. It is a glass tube with the upper end closed and formed into a bulb, the lower, turned up and widened out to make a cistern, and open at the top through a pipette which is supplied with a plug to close it when the instrument is required to be carried about. The upper tube is filled with air, and the lower with sulphuric acid, generally coloured to make it visible, which rises or falls in the tube, according to the air pressure. A carefully graduated scale is attached, which is made by comparison with an ordinary barometer. A thermometer is also attached, so arranged as to render the readings corrected for temperature variations.

Art at the East End.—On Wednesday, last week, Lord Herschell opened the Whitechapel Fine Art Exhibition. This is an annual Exhibition, organized by Canon Barnett sixteen years ago, and is highly popular while it is open, which is for, really, a too limited period—two or three weeks only. While open last year, the Exhibition was visited by over 62,000 people. This is a loan Exhibition, and this year there are nearly 250 works shown. They include the names of Sir E. Burne-Jones, Lady Butler, Turner, Wyllie, Vicat Cole, Sir J. Millais, Lord Leighton, Watts, Orchardson, Stacey Marks, Briton Rivière, and other well-known painters. Amongst the first-named artist's work is the series of *St. George and the Dragon*, and the *Golden Hairs*, lent by Lord Battersea. These works, it is said, the owner will not again allow to go out of his possession; therefore those who wish to see the originals of the subjects that Mr. Fred Hollyer has made us so familiar with in his fine reproductions should not miss the opportunity. The Exhibition is open daily, Sundays as well, up to and including Sunday, April 19.

There is another Fine Art Exhibition also open at the East End—at West Ham. This show contains about the same number of pictures as the Whitechapel one. Amongst the artists represented here are Lord Leighton, Sir John Gilbert, Watts, E. S. Armitage, Stanfield, F. Goodall, W. P. Frith, F. Walker, and other eminent artists whose names space will not permit allusion to. This Exhibition will, after a week or two, be removed to the Town Hall, Stratford, where it will be more conveniently situated for the majority of the residents at the east end of London. Both these Exhibitions are of pictures loaned from private collections, and this may be the only occasion that the public will have the opportunity of seeing them, therefore the opportunity should not be lost.

Ordinary Cameras for Eclipse Observations.—An extremely interesting series of suggestions were made by the President at the last meeting of the British Astronomical Association bearing upon the use of an ordinary camera at the forthcoming eclipse of the sun. Mr. Maunder said that, until his receipt from Professor Oudemann of a photograph which he had taken in 1871, and which he found contained valuable information, he had held the opinion that there was little to be done with an ordinary camera; but he had altered his opinion, and he stated that much good work could be done, at Vardsoe, by those who went with no other apparatus than an ordinary camera and lens of, say, twelve or fourteen-inch focus and upwards, a series of short exposures being given, a quarter of a second enabling sufficient sharpness to be shown. Before the successful camera work done by the Pacific Coast Amateur Photographic Association in the January eclipse of 1889, there had been scarcely a single photograph showing an extent of corona beyond fifty-five minutes taken; but some of the photographs taken by members of the Association considerably exceeded that range, and were valuable in accordance. The most essential point was stability at the moment of exposure, and, to attain this end, he recommended the use of an expedient tried in California with much success. The camera was bolted down to a plank, one end of which rested on the ground while the other was supported on a trestle. His idea was that the best plan would be a small stout stool made with its top slanting at an angle of fourteen degrees to the horizontal, and the camera bolted to that.

One of his remarks, however, if as reported, should be qualified. He is stated to have said that the ordinary portrait lens could have its focus increased by removing the front lens. What really is needed in such case is, when the lens is removed, to put it back again, but, in the place where the back lens usually fits; increased focus will then be obtained; but the lens left in the instrument after removal of the front lens of a portrait combination would be quite unsuitable.

The National Portrait Gallery now Open.—At last the National Portrait Gallery is open to the public, and why its opening has been so long delayed is a question with many. However, on Saturday last it was opened, and without any ceremony whatever. For many years this collection has been little less than a "white elephant" to the authorities, stored in the cellars of the National Gallery, taken to Westminster, some carted to South Kensington, some to Bethnal Green, &c. However, they are now permanently housed in their new home—that part of the National Gallery facing St. Martin's Church. The pictures are arranged somewhat chronologically, commencing at the top of the building. It is here they get the best lighting. In some of the lower rooms they suffer in respect to their illumination, some considerably.

There are something like a thousand portraits in the collection, and they date from the Tudor period downwards. In the assemblage are the portraits of kings, queens, divines, explorers, artists, statesmen, *et hoc genus omne*, and examples of the best work of most of the first portrait painters of this and past ages. Amongst the names may be mentioned Holbein, Sir Peter Lely, Gainsborough, Sir Joshua Reynolds, Romney, Richmond, Benjamin West, Watts, and many others whose work is peculiar to themselves.

Photographers will do well to study the work of the different masters to be seen in the Gallery, as from them they will find much to emulate, and, in some instances, what to avoid, in portraiture. Twenty years or so ago, photographers appeared to go to painters for their poses, columns, curtains, and the like. Now the case seems to be reversed; painters appear to go to the works of the best photographers for their poses, as witness the portraits shown in recent Exhibitions of the Royal Academy, and other leading shows. In many of those pictures, not only is the pose copied, but nearly the whole picture has been painted from the photograph.

THE PHOTOGRAPHIC NATURALIST.*

Photography and Vulcanology.

The careful series of drawings, made in 1767 by Sir W. Hamilton to illustrate the building up of the cone of Vesuvius, would have been far more complete if photography could have been employed to supplement the hand sketches. It was not, however, until the eruption of 1872 that any extensive series of photographs of this interesting volcano were made. In that particular series we have illustrations of the lava streaming down the flanks of the mountain, together with clouds of steam and dust rising from the crater to the height of 20,000 feet. Dr. Johnston-Lavis is now able, by almost daily photographs of Vesuvius, to chronicle the rapid changes which it undergoes, as well as the aspect of the crater both before and after

* Contiaued from page 182.

an eruption. Some valuable information has also been secured in Hawaii by means of a series of photographs taken at short intervals during the advance of a lava stream.

In the library of the British Museum will be found a book published in 1856 by Mallet, and illustrated with a series of photographs, taken by that famous vulcanologist himself, to illustrate the various phenomena produced by the Naples earthquake; but photography has more recently been employed in the far more delicate study of earth tremors or seismology. In 1887, Fouqué and Michel Levy made a series of experiments on the rate of transmission of earth tremors. A reflected beam of light from a mercury dish was focussed on a sensitive plate revolving in the path of a lens. In the absence of any earth movement a circle was produced on the plate, but the smallest vibration caused a widening of the circumference, indicating the beginning, duration, and end of the shock.

A photographic tremor recorder or seismograph was described in 1892 in the *British Association Reports*. A beam of light from a vertical slit was made to pass through a lens to a mirror, and thence to a horizontal slit behind which a photographic plate moved vertically by clockwork. Continuous daily observations were taken on plates, twelve inches long by two and a half inches wide, moving slowly in twenty-four hours across the slit. By a more rapid motion even tremor storms were indicated. Professor Milne used a similar method, by connecting a galvanometer to a deep well, to record changes of electric potential in the earth during the progress of an earthquake. The frequent Japanese earthquakes have given Professors Burton and Milne an opportunity of securing photographic records of the utmost value in the study of seismology.

In connexion with this subject, it may be mentioned that the ordinary seismograph records on smoked glass are conveniently copied for permanent preservation upon cyanotype paper.

Subterranean and Submarine Photography.

The first subterranean photograph was taken in 1865, and shown to the British Association by Mr. A. Brothers. It was a view of the Cupola Cavern, Blue John Mine, Derbyshire. In the same year the first coal-mine photograph was secured by Jackson Bros. of Oldham, and Piazzi Smyth photographed the interior of the Egyptian pyramids. All these, as well as Anthony's series of photographs of the Mammoth Cave, accomplished in the following year, were taken by means of magnesium ribbon.

Since the introduction of modern dry plates, the facilities for subterranean photography have greatly increased. Sopwith's series of photographs, illustrating coal mining, were obtained in 1881, the light from burning magnesium ribbon being concentrated by parabolic tin reflectors. Both coal and metalliferous mining have lately been well illustrated by Messrs. Burrow and Hughes, whose experience has been chronicled in papers read before the Royal Photographic Society and elsewhere. The peculiar difficulties of this department of photography are well shown by the fact that less than twenty per cent. of the negatives taken by them were good, and seventy per cent. were complete failures. The difficulties arise chiefly from the imperfection of illumination, especially in coal mines. The smoke from blasting and the moisture of the atmosphere are also obstacles to success. The woodwork of the apparatus becomes swollen and stiff, while the lens becomes rapidly dimmed by condensed moisture, and must be examined immediately before exposure. A preliminary rubbing of the lens with glycerine diminishes this evil. If magnesium ribbon is used for the purpose of viewing the picture before exposure, care must be taken to let the smoke clear away before uncapping the lens. Focussing is better done by means of candles placed in various positions in the field of view. The lens which Mr. Burrow found most suitable was the Zeiss anastigmatic, *f*·7·2, and for confined spaces the Roas concentric, *f*·22.

As regards underground lighting, the following are some of the advantages and disadvantages of the ordinary artificial illuminants:—

1. *Electric Light.*—The arc light gives good results, but is seldom available. It is not suitable for miners at work on account of the long exposure necessary. A sheet of white paper behind the light forms a good reflector and relieves the half-tones. Incandescent lamps have been proved to be useless for underground work.

2. *Bengal Fire.*—This gives a brilliant white flame, but the fumes discolour stalactites, and the sulphurous smoke not only dims the atmosphere but is dangerous to inhale.

3. *Magnesium Ribbon.*—The light from this source is somewhat uneven. A long exposure is necessary, and a heavy smoke is produced, which is of great inconvenience where there is bad ventilation. It is better when burnt in oxygen gas.

4. *Flashlight Powder.*—Most of these powders are dangerous to use, as they explode on percussion and give irrespirable combustion products. The following composition has been recommended as giving an intense light, visible at a distance of 100 kilometres:—Magnesium powder, 20 parts; barium nitrate, 30 parts; flowers of sulphur 4 parts; and beef fat 7 parts. The fat is added in a melted state to the mixture and cooled in zinc boxes. A charge of half a kilogramme burns for twenty seconds.

5. *Magnesium Powder.*—This is the safest of all flashlights, giving but little smoke, and requiring but a short exposure if burnt in a suitable lamp. Messrs. Hughes and Burrow prefer the Platinotype Company's lamp. Magazine flash lamps are now to be had containing enough powder for twenty ordinary flashes. By this means successive flashes can be given if necessary from different positions to relieve the shadows. A large quantity of the powder should be used for each flash to secure full exposure.

Of course, only the quickest plates should be used, and development should be slow, with a diluted developer to avoid hard contrasts. It has been suggested that, for proper illumination, the greater source of light should be placed at a short distance on one side of the camera, and a lesser source, or shadow softener, above the lens. To prevent smoke and ashes from being thrown in front of the lens, a lamp with a vertical flame, rather than a horizontal one, is to be preferred.

Submarine photography has not been very extensively practised, although various efforts have been made to accomplish this end. In 1866, M. Bazin described a complicated arrangement for photographing the sea bed. It consisted practically of a diving bell, from which the operator took photographs, by electric light, through strong glass windows. More recently, M. Bontan, of Paris, has obtained excellent photographs of the bottom of the sea, by means of a submarine camera, consisting of an ordinary hand camera enclosed in a watertight metal box, with plate-glass sides. In shallow water ordinary daylight suffices but in deep water the operator descended in a diving dress, and used the magnesium flash light. A blue glass screen in front of the lens was found advantageous.

An ingenious contrivance for finding the direction of submarine currents and their temperature was submitted in 1874 to the Berlin Geographical Society, by Dr. Neumeyer. The camera consisted of an hermetically sealed copper box, containing a thermometer and a compass needle. The box had a rudder attached to it, causing it to lie with the current, while at any given moment the temperature and compass bearing could be imprinted on a sensitive surface by means of an electric arc light. These experiments are of interest, when we remember the great difficulty surrounding all submarine observations and the persistence with which the resources of photography are employed to overcome natural obstacles.

Museum Photography.

There is at the present time a growing tendency to illustrate geological text-books with process blocks made from photographs of selected museum specimens. In order to make such reproductions really effective, great care is necessary in arranging the light and shade. In general, a vertical aspect is necessary, for which purpose the special stand with glass platform, described in a former article,* will be found convenient.

Quite recently, Messrs. Sharp & Hitchmough have manufactured a special museum stand and camera to meet the requirements of the Liverpool Museum authorities. The stand is meant for use, not only in the museum but also in certain cases in the field, where fossils or minerals are required to be represented *in situ*, in awkward positions for the ordinary camera. It can be used with equal facility for photographing objects in a horizontal plane, either above or below the level of the camera, the camera itself retaining its normal position. A forward extension enables the lens to be brought directly over fixed show cases, and a prism placed between the lenses enables objects in the horizontal plane to be readily accessible. An adjustable glass platform, with a reflector below, is useful for supporting solid objects, without the danger of cast shadows, and at the same time, allowing backgrounds of suitable colour to be employed. This apparatus possesses all the advantages of the vertical camera, previously described, without the inconvenience arising from the difficulty of focussing in the vertical position.

The vast collections of splendid specimens of minerals and fossils stored up in our museums would be rendered of far greater educational value if such a camera were at the disposal of those wishing to secure either book illustrations or lantern slides for lecture purposes.

All photographs of minerals or fossils should possess some simple

* The British Journal of Photography, vol. xlii. p. 42 (January 18, 1895).

means of estimating their natural size, either by an attached scale, or by placing by the side of the specimen some familiar object of known magnitude.

In many cases, a known distance can be marked on the specimen itself by means of two small discs of white paper, while paper arrows properly disposed can be used to direct attention to any special feature which the specimen illustrates.

Photographs of Rock Sections.

The quantitative mineral analysis of a complex rock by chemical means is at all times a difficult process, and often quite impossible. A ready means of arriving at an approximate result, however, when not too fine grained, is afforded by the simple device of photographing a thin transparent section of the rock.

After cutting out the various crystals from a paper positive and sorting them, their relative proportions can be determined by weighing the different samples. This is more accurate than the plan advocated by Delesse of drawing the outlines of the crystals by means of the camera lucida.

To photograph a rock section, it often happens that only a moderate enlargement is necessary. A microscope need not then be used, as a magnification of from two to five diameters is readily obtained by the ordinary camera in conjunction with a wide-angle lens. A symmetrical lens of short focus, about two inches, for instance, answers very well, as did the small Petzval postage-stamp lenses of an inch and a half focal length formerly in the market. A long extension or lengthening cone is necessary. In the absence of a lens of sufficiently short focus, the best plan is to obtain a photo-microscopic attachment for the camera, consisting of a simple arrangement to carry the objective, and an adjustable stage for the rock section. For illumination the ordinary microscope lamp will do when low powers only are used.

Sometimes a better contrast is obtained in photographs of rock sections by using the polariscope, in which case isochromatic plates and monochromatic light are beneficial. Occasionally it may be found that a rock section is too coarse and opaque to give good results on magnification with the camera. In this case, the section can itself be used as a negative, and a print obtained by contact on sensitive paper or on glass, and from this the positive picture can afterwards be prepared and enlarged to any size.

It is not proposed here to enter into the domain of photo-micrography proper required in more advanced petrographical work with high powers, as this subject can be more conveniently treated in a subsequent article.

Conclusion.

Probably there are few geologists who have not had occasion to regret either the loss of time involved in making hand sketches of interesting geological subjects, or, what is still more important, the inadequacy of the result to represent the desired effect. In photography we have a simple means of overcoming both of these difficulties. But the value of a geological photograph is largely increased if it is accompanied by an outline hand sketch, showing the details intended to be expressed. This is done with great effect in the geological photographs displayed in the Museum of Practical Geology in London, which also illustrate in a striking manner one of the great advantages of a photograph over a hand sketch for educational purposes. Hand sketches show only that to which attention is desired to be drawn. Whether it be a fault, a contortion of strata, or an igneous dyke, a single glance is enough to reveal the whole object of the drawing. The consequence is that a student is disappointed on first commencing field work to find nature not so plain as the diagrams in his text-book, since the features he is looking for are often obscured in the field by a mass of secondary detail, which he only learns how to eliminate by practice. With a photograph the case is different. The eye has to search the photograph for the required feature as diligently as the field geologist searches the face of the cliff or the side of the cutting, and the student derives from the study of photographs a preliminary practical training which is invaluable in his future field work.

But another advantage often to be derived from the study of geological photographs places them in one respect even before nature herself. Structures which easily escape notice in the field are brought into prominence when condensed by the lens into the small area of a photograph. In this way minute contortions, the angles of intersection of jointing planes, the angle of dip of strata, the presence of obscure bedding planes, and other important features, are more accurately detected in a photograph than in an actual section. Perhaps the question may arise in some minds as to what is a geological photograph, and how may it be known to be worth preservation. In one respect all photographs of natural objects are geological photographs, and it is impossible to say how soon a photograph, now about to be discarded, may prove of inestimable value to science. Change and decay are going on around us in the inorganic as well as in the organic world. The agencies of denudation rapidly alter the aspect of the country; interesting sections become overgrown with vegetation or buried by the *débris* of a winter's frost; volcanic forces destroy the shapes of mountains, and visit even men and cities with sudden destruction; fossils found perfect *in situ* become broken during extraction, or perish subsequently in the museum or cabinet from the oxidising action of the atmosphere. No natural feature can be looked upon as lasting, and science calls aloud for the duplication of valuable evidence while there is yet time. It is true that photography is as yet too young a science to have proved the absolute superiority of its records to the ravages of time; but we have photographic processes at our command which, if they do not give us imperishable results, are at least more permanent than the mountains and the plains, and which possess, moreover, this inestimable advantage, the power of being reproduced. J. Vincent Elsden.

PHOTOGRAPHIC WORKERS AT WORK.

III.—How Messrs. Wellington & Ward Make Bromide Paper.

Like the monks of old, makers of plates and paper—we could not help thinking as we entered Messrs. Wellington & Ward's premises in the picturesque little village of Boreham Wood—seem to select the most charming localities they can find for the scene of their labours. For the cause of this reflection, one need only pay such a visit as that referred to, and Messrs. W. & W. are by no means alone in this respect. If the classic neighbourhood of Ilford does not appeal to us as strongly as it does, doubtless, to, say, Mr. George Davison, on the score of beauty, at least, Barnet, Ashtead, and Richmond, to name three other of the homes of the dry-plate and paper trade at random, would hold their own for rural beauty with any three districts within fifty miles of London.

With some such envious meditations we entered the factory, a substantially built structure, complete in itself, but obviously designed with a view to facilitate future extensions, and found ourselves face with Mr. J. B. B. Wellington and Mr. H. H. Ward, partners in the business, and Mr. E. A. Allom, their manager in the office. It may interest our readers to know that, while enjoying the advantage of Mr. Wellington's experience of emulsion-making and photography generally, Mr. Ward is well fitted, both by taste and training, for engineering work, and no small number of the fittings and appliances in use in the factory are both designed and made by its proprietors.

In our tour through the various departments into which the buildings are divided, we were accompanied by Mr. Wellington himself, who led the way first into his laboratory, where also are kept the chemicals, &c., for the manufacture of the firm's various emulsions. A laboratory is generally most interesting to whoever has to work in it, and the one in question was no exception to the rule, the most attractive of its contents being a few bags of nitrate of silver, which required no small exertion to lift. Having lifted them—in the English, and not the Highland, sense—we pass out from the laboratory into a room devoted to emulsion-making. This room, and indeed the whole of the factory, is provided with non-actinic light by means of large wooden, boxlike structures containing a gas jet, and having their sides enclosed with golden fabric, giving a safe and pleasant light. In one corner of the emulsion-room stands a centrifugal separator, geared to the shafting above, while by its side is one of the huge earthenware emulsion mixers, quite large enough for a morning "tub."

While appreciating fully the method of speed determination of Messrs. Hurter & Driffield with which he has worked, Mr. Wellington tells us that he employs a modification of the Warnerke sensitometer to satisfy himself as to the progress of any particular batch of emulsion; and, while saying this, he shows us his sensitometer in which the trials are made, the plates which are exposed wet being prevented from coming into contact with the tablet of the instrument by means of three pins at the sides.

It is in this room that the emulsion is made, being then transferred to one of two rooms leading out of it, which is provided with a series of copper tanks with lids, under each of which, and enclosed with brickwork, is a series of large Bunsen gas burners. This is the cooking or boiling room, and the jars of emulsion, being removed to the tanks, are then heated to obtain the desired speed in the product.

The other room mentioned above is the washing room, where also is the stock of emulsions ready for coating. The jelly-like mass which the

emulsion presents when it has been allowed to set after boiling, is here cut up into shreds, and exposed with constant agitation to the action of running water, until all the soluble salts are removed. The washers in which this process is accomplished are seen like large barrels arranged over tanks all down one side of the room, and connected by belting with the shafting overhead.

From this department the finished emulsion, after being remelted, is taken to the coating room, to be spread upon the paper which is there waiting to receive it. The paper arrives in large rolls, each about 1500 feet long, and containing no less than 5000 square feet of paper. The process of coating seems of the simplest possible nature. A roll is mounted on the machine, the paper passed round two or three rollers, a stream of emulsion is run into the trough, and the machine started. Away goes the paper, and in three hours there is three-quarters of a mile of bromide paper hanging in festoons all along the room in which it is dried. The coating, drying, and rolling up, is done in what may be conveniently considered as one large room. At one end of this stands the coating machine, in which the paper is led round a silver-plated cylinder, the bottom of which dips below the surface of the emulsion in a plated metal trough, underneath which is a hot-water vessel to keep the contents of the trough liquid, and at the right temperature for coating. As the paper leaves the trough, it is led away at once over a series of rollers to a machine which forms it into long festoons as fast as it is coated, and conveys these festoons away from the coating machine until the room is full.

The quantity of emulsion spread upon the paper is determined by the rate at which the paper-coating machine is driven. The slower the paper band travels through the trough, the thinner the coating which remains on it, and *vice versâ*.

When the coating room is full, the operation is stopped, and the paper left hanging up to dry, which it will do completely in from four to eight hours. To facilitate this operation, the floor of the chamber carries a number of hot-water pipes, and cold air from outside the building is admitted along the edges where the walls meet the floor. From the top of the room three large fans exhaust the moisture-laden air from the room, and so set up a steady current through it, which ensures rapid drying. We might mention, in passing, that the whole of the factory is ventilated in the same way by means of fans and large wooden ventilating shafts, which are seen up against the ceiling of the various rooms.

As soon as the paper is dry, the end of it which was first coated is led into a winding machine at the other end of the coating room, and, the winder being started, it is wound up into a roll similar to the uncoated one, which was first placed in the coating machine, the three-quarters of a mile of paper being wound down in about forty minutes, the operation being quicker than coating.

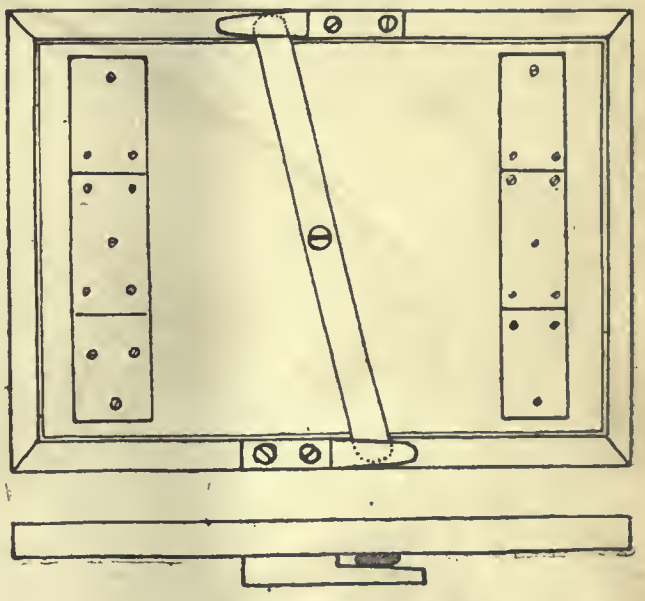
These rolls are then taken away into a store room until wanted, or, if required at once, are conveyed to one of the cutting machines, and there cut and packed. Two patterns of cutting machinery are in use at the Elstree factory; one is the well-known guillotine, which needs no further mention here, and the other a combination of the guillotine principle with that of a slitting machine. In this latter the roll of paper is inserted in the apparatus, and the paper passes between guiding rollers, and thence between two spindles placed some little distance apart, but bearing, at distances which can be varied, circular wheels or discs with sharp edges, the diameter of which is such that the sharp edges of the discs on the two spindles just meet. Between the edges of these discs the paper is led, and is by them cut up into strips much in the same way as it would be cut by a pair of scissors. These strips then pass to the guillotine portion of the machine, where they are again cut up in a direction at right angles to the first, the machine automatically ringing a bell when each dozen pieces have been so cut. In this way—supposing, for example, 10×8 pieces are wanted—the strip of paper which on the roll is forty-one inches wide is first sliced up by the discs into four strips ten inches wide, and these are in their turn cut up by the guillotine into eight-inch lengths.

This is the room in which the packing is done, for which purpose it is provided with long tables, behind which at intervals are the wooden, non-actinic lanterns previously referred to. The lads who do the packing each work opposite one of these, and, after examining each sheet to see that it is free from blemishes of any kind, wrap them up in dozens, and enclose them in the familiar envelopes in which the paper is sold.

From the packing room we pass into the storeroom, where the stock of the finished article is kept to supply to customers. This room is provided with plenty of shelf accommodation, but requires no comment from us. It is here that we once more emerge into daylight, which we left on entering the emulsion-making room, and a door in the packing room leads directly into Mr. Wellington's laboratory, whence we started. The various rooms in which the processes are carried out are arranged in a series going entirely round the factory, the first and final stages of the manufacture being conducted in rooms adjoining one another.

It was in the laboratory that we were shown specimens of the new film upon which Mr. Wellington has lately been concentrating his attention. Its manufacture resembles very closely that of the bromide paper just described, but is more elaborate, the series of operations having to be repeated three times to make the finished film. The paper is first coated with the preparation of gums, which allow the film bearing the image to be subsequently stripped from its paper support, and after this treatment receives a coating of the insoluble gelatine which forms the substance of the film itself. It is not until this has been applied and has dried that it is ready for the application of the sensitive emulsion, so that the new film undergoes three distinct coatings and dryings. At the time of our visit, a large batch of emulsion was in course of preparation for the film, and we had the opportunity of seeing this tested in the laboratory, with the very satisfactory result that indicated that the batch was a clean, bright one, giving a reading of at least 25 Warnerke, with plenty of density and pluck.

So far, all the operations have been conducted on the ground floor; but, before leaving the factory, Mr. Wellington takes us upstairs into the large lofts, which are above the rooms below, and which are mostly used as supplementary stores, but one is fitted up with sinks, &c., as a dark room. It is here that large quantities of bromide prints are turned out daily for use for advertising purposes, and we noticed several ingenious little labour-saving dodges being used for the purpose. The paper is kept packed flat in boxes with hinged lids, each of which is provided with two divisions, one for unexposed, and one for exposed, prints, development being effected only when a large number of prints are ready for the operation. The printing frames used are made on the premises, and, as shown in our sketch, are a simplified form, rendered possible by the paper, which is printed by gaslight, not requiring examination during the operation. The back is therefore in one piece, and is kept flat by means of two stays being held in position by a single bar which is wedged up at its two ends under two projections provided for the purpose, the shape of which can be gathered from the side view which we give.



Printing frame for bromide paper.

On leaving the factory to go to the station, we pass by outbuildings containing the hot-water arrangements for heating the building, the motive power in the shape of a four-horse-power gas engine as well as a blacksmith's shop, and other conveniences, and, bidding adieu to our courteous guide, once more the feeling of envy comes over us that our lines are hardly cast in such pleasant places as are those of the plate and paper-makers.

ON THE PRINTING OF SINGLE FIGURES IN GROUP NEGATIVES.

II.

In a previous article I referred to the printing of such figures in group negatives as did not require any alteration of the existing background; in which case, by merely providing a mask of suitable size and shape, the original negative was used for the purpose of printing, and, in cases where the size of figure was too small, a slight enlargement of same was easily made by any of the practical methods of enlargement direct on to any of the excellent platino-bromide papers which are so useful for the purpose.

In the majority of instances, however, it will be found that, owing to some overlapping of the figure, such as by a portion of the dress, or face, or figure, immediately beside the one it is desired to extract, the original background, of which such will form a part, becomes quite unsuitable for printing by means of merely masking the face and bust, and, when this occurs, the operation which we are considering is not nearly so easily performed, recourse having to be had to some method of dealing with the case whereby the undesirable background and surroundings have to be removed and others substituted for the same.

Of the various methods of accomplishing this end, perhaps there is none more practical or so certain in the results achieved as that of treating a paper print containing the figure, and not working on the negative at all. The method I am about to describe used to be practised in the good old collodion days, and, if neatly gone about, will produce very excellent results indeed.

Whenever, therefore, any figure has to be extracted from a group negative, and a different background has to be introduced, let the negative, or that portion of it containing the figure, be printed with much care on ordinary albumenised paper. In making this print, every attention should be bestowed upon the work, so as to produce the best possible result *for the purpose of copying*, with a view to the production of another negative of the size it is desired the finished picture to assume. Much of the success in the operation will depend upon the character of the print that is thrown off from the original negative.

In this print, of course, the undesirable background will appear, but it is easily removed, and a plain one substituted, by carrying out the following plan :—

Provide a suitable water-colour pigment for the purpose of painting out the entire surroundings of the face and bust. In my opinion, the most desirable tint to employ for this purpose is a good slate colour, and this is easily acquired by mixing proper quantities of flake white and ivory black, so as to yield a body sufficiently opaque to completely obliterate the design on the surface of the print.

In undertaking this blocking-out operation, a word of caution is required. It is no use attempting such work with the aid of any cheap rubbish in the way of the colours used. The very finest samples of the colours I have mentioned must be employed, and for this reason, that, in applying the slate tint to the face of the photograph, not only must it be sufficiently opaque to entirely stop out all the original background, but it must, when laid on, be of such quality as will permit of its being flattened down on the surface of the print in such a manner as to show a beautifully smooth surface, free from all streaks and rugosities, so as to permit of a clean, even background in the copying negative. To obtain this smooth surface on the print, the very finest samples of colour must be used. Cheap trash will not work in anything like the same manner, and, when used, are certain to end in failure. Some idea of the value of the two colours I have mentioned may be obtained when I state that small cakes of such, made by our leading colourmen, cost 8*d*. each. With these on hand, any one can approach the work with a tolerable amount of assurance of success.

To prepare the tint required, let a few drops of thick gum be placed on a clean opal slab, the rough side of which is best; into this rub alternately the white and black pigments until a good slate tint is produced. A suitable print having been obtained and mounted on a firm support, let the colour be carefully applied round the outline of the face and bust by means of a fine brush. To do this neatly, I advise any one whose eyesight is not particularly good to obtain a strong pair of spectacles—say, those of about nine inches. The use of spectacles for this purpose is much to be preferred over a hand magnifying glass, for the simple reason they leave both hands free, and permit of the work being done with much greater comfort and ease. Some workers may imagine they can do as good work without spectacles as with them. This is a mistake, however. There is no doubt about it that the aid of magnifying glasses permits of very much finer and closer work being done with the brush than when such are not used. And just here it should be mentioned that, seeing the work has to be somewhat enlarged at a later stage, the necessity of the utmost care being observed in blocking out the outline will be apparent to any one.

Having gone carefully round the edges of the figure, the colour must then be evenly applied all around, and if the proper amount of gum has been used in mixing them on the slab, when such is carefully applied, so as to avoid streaks, the pigment will settle down beautifully smooth, with a somewhat enamelled surface, like the rest of the albumenised surface of the paper.

When such is accomplished, the figure, with the new background, is copied on a suitable plate to the desired size, and the negative so obtained, being varnished and retouched, is ready for printing by any of the most approved or desired methods, a vignetted bust being among the best styles to adopt.

By the method I have described most excellent results are obtained, and it has also this further advantage, that in cases where only a paper print exists, containing the figure it is desired to extract, the treatment does not injure the photograph in any way, for, by merely rubbing the surface of the print after the colour has been applied and the negative made, the water colour will vanish, and not the slightest trace of it remain or any injury to the surface of the print be apparent.

There is, however, another method whereby the same results may be arrived at; but, in my opinion, it is not so easy of accomplishment as the one I have described. I refer to the blocking out of the background in the original negative by means of some opaque medium, and then printing the blocked-out figure in the usual way. This leaves the image resting on a blank, white background. To print in a tinted one, recourse must again be had to shielding off or blocking out the image on the face of the print.

Where only one copy is desired, and that of the same size as the original, the image may be covered up with any suitable water-colour pigment, such as gamboge, and, when this is carefully painted over the image, and allowed to dry, the white background is tinted down by means of a vignette shape, after which the gamboge will wash off when the print is placed in the washing water prior to toning operations, the parts where such was applied being in no way injured, and eventually toning the same as if such had never been applied.

A very slight consideration of these two methods will be needed by any one to see that of such the former is by far the best to employ, and for these reasons, that, with much less trouble, an enlarged negative is produced, from which any amount of similar prints may be pulled, only one operation of blocking out being required. By the latter method, when more than one print is desired, every print has to be shielded with gamboge, and this in itself is not easily performed, frequently yielding prints with a white streak round the outlines, caused by the slightest overlapping of the gamboge.

Some workers, instead of blocking off the printed image by means of gamboge, use a cut-out disc printed from the same negative, and shield the image with this; but the difficulty here lies in being able to cut accurately to the outline, and, even when such has been done, a further trouble ensues in the shape of being able to correctly superimpose this cut-out disc over the image whilst the background is being tinted.

Some workers who have never practised retouching may think that what I have described entails a lot of expertness, which only professionals are capable of accomplishing. Such, however, is not the case. Any one tolerably proficient with a brush will, with the aid of spectacles and the best quality of colours, be enabled to follow round the outlines of any figure without overlapping, and accomplish a very neat and useful feat in photography with absolute certainty of success.

T. N. Armstrong.

RADIOGRAPHY.

Perhaps this title may commend itself for permanent adoption to describe the new form and additional means of extending physical research.

The question which waits for an answer is the cause of the latent effect which can be rendered visible by any suitable photographic developer. A.—Is it the direct transmission of the extra refrangible or so-called chemical rays through substances which, though opaque to ordinary light, are sufficiently transparent to these chemical rays as to be able to cast shadows of the more opaque bone and metals, and yet able to pass comparatively freely through flesh and organic

tissues; B, or is it due to the effect of these rays in stimulating a fresh set of light waves, producing the fluorescent effect, the latent image being due to the photographic property of the fluorescent light? If either A or B is the correct solution of the problem, we might with some reason regard it as a new phase of true photography. Now, let us consider, and see how far we are justified in making this assumption.

C. Captain W. de W. Abney suggests that the glass carrying the sensitised gelatine might be capable of fluorescing in the X rays, and thus produce the developable shadowgram, and in support of this hypothesis points out that the latent image of these shadowgrams makes its first appearance next to the surface of the glass, and not on the naked side of the sensitive gelatine. And, further, it is stated that, if a ferrotype plate coated with a collodion emulsion be substituted, the X rays so far do not produce shadow photographs. The two plates being alike in sensitive salts, the difference between the two being the surface upon which they lie—and the vehicle in which they are embedded—and, finally, glass fluoresces in these rays, and metals do not, and so far a very strong ground for the assumption is made out, were it not for an equally strong claim being set up by the theory of electrical molecular bombardment and stress.

D. In support of this, Professor J. J. Thomson's experiments with the X rays may be adduced. This gentleman has found that these rays will readily discharge an electrically charged surface, and considers the effect of these rays to be far more readily felt by an electrometer than by a photographic plate, whilst a developable image is readily produced by electrical stress.

E. In order to test these two theories, I would suggest to those gentlemen who are actively engaged with radiography to try the following: Employ a celluloid film, instead of glass plates.

If a shadowgram be obtained, then A or D are indicated, the latent image is either the result of the direct photographic power of the X rays, or due to electrical stress.

F. But if no picture is obtained, then B, the fluorescent theory, seems to be indicated—because the celluloid support of the sensitive gelatine film is not fluorescent. To prove this, take another celluloid film and coat the back with a fluorescent substance, such as fluorescing quinine, or esculine, or a sheet of uranium glass, may be placed in contact with the celluloid back. If thus prepared, a shadowgram is obtained. We may safely assert fluorescence to be the correct explanation with some amount of reason.

G. The fact of the ferrotype plate not receiving any impression can be explained both by B and D, and, if a celluloid film behaves in the same way, B is indicated more completely; but the mere fact that a metal coated with a sensitised film does not produce any developable image is equally capable of explanation under the electrical theory.

The sensitised film is a very poor insulator, in fact for this purpose may be considered a good conductor of electricity, whilst the metal plate in contact with every part of the film equalises the potential, and uniformly discharges the electric energy. Under these conditions, there is no cause for wonder that the ferrotype plate is unacted upon by the X rays; but, if a celluloid film will receive a latent image when the ferrotype plate does not, D only is indicated, because, whilst the celluloid plate is an insulator of electricity, it is not a fluorescent substance.

For the electrical effect we require an insulator such as glass and celluloid, both good dielectrics, which are capable of absorbing to a certain extent electrical pressure.

To illustrate what I mean, let a perfectly clean and dry sheet of glass be coated on one side with tinfoil, and on the other let a printed bill be laid face downward upon the glass, leaving a sufficient margin of clear glass all round for insulation, then place a sheet of metal upon the printed bill. Now connect the tinfoil to one terminal and the metal sheet to the other terminal of the secondary of an induction coil, allow sparks to pass between the points for a short period; one or two minutes is amply sufficient, then disconnect and remove the metal plate and the printed bill, and gently breathe upon the glass. The whole of the printed matter will appear upon the surface of the glass. If the tinfoil be removed, the plate may be suspended, and for a considerable time will show an impress of the whole of the printed matter in clear and frosted glass, when breathed upon. The glass surface may even be cleaned with benzole, and polished with a clean leather, still it will retain its power of reproducing the impress each time it is breathed upon, the explanation being probably that organic particles from the printing ink are actually embedded beneath the surface of glass, and defy removal by the benzine solvent; or, that the printing ink is an insulator, and the absorbed charge in the glass under the letters is not discharged when the paper bill is removed. Benzole, being a good insulator of electricity, would not therefore remove the charge from those portions of the dielectric protected by the printing ink, whilst the rest of the glass, being in contact with the more or less humid paper, would be discharged, and, upon breathing on the glass, the undischarged portions of the surface of the dielectric collect and hold the moisture, whilst the discharged portions allow the moist vapour to dry off.

If a glass plate with a sensitive emulsion be employed, then a negative of the bill is produced, from the greater amount of molecular disturbance taking place between the insulating letters; whether this be the correct explanation of electrography or not, we have ample evidence that variations of electrical stress have the power analogous to light of producing molecular disturbance, separating the haloid from the metal, in due proportion to the relative intensity of the light or variation in the amount and degree of electric pressure.

FREDK. H. VARLEY.

OVER-EXPOSURE AND CHLORIDE RESTRAINERS.

MR. DEBENHAM'S recent paper on the treatment of over-exposure is in many respects instructive, and the account of his experiences cannot fail to interest those who are on the outlook for fresh information on the important subject upon which he writes.

There is, naturally enough, a considerable diversity of opinion among photographers in regard to the manner in which over-exposure should be dealt with. Though the ordinary bromide restrainer has met with well-nigh universal acceptance, there are few who, at the present day, will refuse to admit that its capabilities are limited. In cases of excessive over-exposure it is at best but an unsatisfactory remedy, and in the majority it will be found no remedy at all. As it is, however, generally possible to avoid giving an exposure greatly in excess of what is required, and seeing that in practice such an exposure is comparatively rarely given, this drawback to the employment of the bromide restrainer does not make itself greatly felt.

Over-exposure, in fact, is seldom intentional, and therefore, when it does occur, the probabilities are that it will be slight rather than excessive.

To those who are content to work under these limitations, the ordinary treatment is probably the best that could be devised to meet the difficulties of the case. There are, however, many who, at some sacrifice to the established order of things, would welcome a method of treatment under which greater latitude of exposure might at all times be obtained.

I am glad to see that Mr. Debenham seems to be of this way of thinking. He appears to recognise what is, in fact, the very gist of the matter, to wit, that excessive exposure must be regarded as an evil only in proportion to the extent to which it defies remedy.

That it does frequently defy remedy under the old treatment is only too evident, otherwise it would not be looked upon, as it still is, as one of the chief bugbears of practical photography. The very fact that we photographers, as a body, have not attempted to formulate a scheme of vastly increased exposures is tantamount to a confession of our inability to deal with the difficulties that would arise during development were such a scheme actually adopted. Yet, provided we are willing to exchange the existing form of restrainer for one more energetic and effective, I fail to see that there is any reason whatever why we should not avail ourselves of the advantages presented by a scheme of this character.

In January 1894 I described in these pages a simple method of controlling the development in cases of over-exposure. As some of my readers may perhaps remember, I proposed to convert the excess of reduced bromide of silver in an over-exposed film into chloride of silver, the latter salt, as most photographers are aware, being little, if at all, affected by the action of the developer. In order to effect this conversion, I employed a weak aqueous solution of chlorine gas. After a preliminary soaking in this solution (the duration of which, of course, varied according to the length of the exposure), the film was removed, rinsed, and developed in the ordinary way.

Looked at from a purely theoretical standpoint, this process seems admirably adapted to effect the purpose for which it was designed. Nor, indeed (as I endeavoured to show in the paper already referred to), is its practical value to be under-rated, seeing that the remedy can, after a few trials, be applied in such a way as to produce really excellent results. It is not, however, a remedy that is likely to become popular, at all events so far as the average photographer is concerned. In the first place, he will probably be unwilling to be at the pains of preparing a chlorine solution. This, however, is not the only difficulty he will have to encounter. Having prepared the solution, he must next experiment in order to ascertain its strength.

What is worst of all, he will have to repeat the testing operations from time to time, owing to the unfortunate circumstance that the gaseous solution cannot be preserved without there ensuing a gradual loss of strength.

Obviously, then, this form of treatment, though sound in principle, will not be viewed with favour by those whose demand is for a simple practical remedy for over-exposure.

Fortunately, there are several other reagents which are capable of supplying the place of the chlorine water in the process above described, and by the application of which the conversion of the reduced bromide into chloride may be quite as readily effected. There are, for instance, the perchlorides of certain of the commoner metals.

Of these, the most suitable for photographic purposes are those of iron, copper, and tin. At present I intend to confine my remarks to ferric chloride.

A solution of this salt, as I need hardly remind my readers, is sometimes employed as a reducing agent. On immersing an over-dense negative in such a solution, the metallic silver of which the image is composed is gradually converted into chloride at the expense of part of the chlorine of the iron salt, the latter being thereby reduced to the ferrous state. These changes are represented in this equation:—

$$Fe_2Cl_6 + 2Ag = 2AgCl + 2FeCl_2.$$

We might here substitute cupric chloride for the perchloride of iron, in which case the products of the double decomposition would be argentic chloride and cuprous chloride, and the following equation would then represent the reaction:—

$$2CuCl_2 + 2Ag = 2AgCl + Cu_2Cl_2.$$

Suppose, however, that, instead of treating the visible image which has been produced by the action of the developer, we apply one or other of these solutions to the exposed film immediately before development. Should we do so, we shall find that, though the chemical reaction remains substantially the same, the results are somewhat different. Let us consider the two cases apart. In the first, we apply the treatment after the development, and thereby effect a certain reduction in the absolute or apparent density of the visible image. In the other case, the only difference is that the film has been treated with the chloride solution *before* development. Here, reasoning by analogy, we shall probably be led to conclude that we have effected a reduction in what, for want of a better term, I may call *the potential density of the latent image*, such, as experiment proves, is, in fact, the case.

Now, under ordinary circumstances, we go to work to reduce this potential density in quite another way, that is to say, we add a restrainer to the developer, and, by means of the former, control the growth of the absolute or apparent density. It is evident, therefore, that, in cases of over-exposure, the one form of treatment may be substituted for the other. The chloride treatment is, however, to be preferred whenever we are dealing with excessive exposures, seeing that the ferric salt, as compared with the bromides of the alkalies, is by far the more powerful in action. In practice I have obtained the best results with a solution of the strength here given:—

Hydrated ferric chloride	30 grains.
Water	10 fluid ounces.

Just a word as to the hydrated ferric chloride. This salt, being extremely deliquescent, cannot be preserved in the crystalline state for any considerable length of time. A ten per cent. stock solution should therefore be prepared in the first instance, a portion of which is to be diluted to the proper extent when the solution is required for use.

MATTHEW WILSON.

(To be continued.)

ON A NEW METHOD OF PREPARING PLATES SENSITIVE TO THE ULTRA-VIOLET RAYS.*

III.—Increasing the Sensitiveness of Silver Bromide to the Ultra-violet Rays.

The sensitiveness of silver bromide to the rays beyond wave-length 220$\mu\mu$ may be increased by the addition of silver iodide. In the same way as gelatine emulsion plates with bromide of silver are improved by iodide, so may also be the plates sensitive to ultra-violet. Plates have been tried containing 5, 10, and 20 per cent. of silver iodide, and better results have throughout been obtained than with pure silver bromide.

* Continued from page 220.

The iodide increases not only the sensitiveness but also the intensity and clearness. *This only obtains, however, when both the bromide and the iodide are precipitated together from the same solution.* A mixture of the two precipitated apart from one another gives plates of very ordinary sensitiveness. Pure silver bromo-iodide is consequently also very variably sensitive to the rays beyond 220$\mu\mu$, according to the manner of its preparation, as bromo-iodide emulsions with gelatine are with respect to the rest of the spectrum.*

I give below the formula for preparing bromo-iodised plates sensitive to ultra-violet which have answered better than all others for my photographs of the shortest wave-lengths:—

A.

Potassium bromide	6 grammes.
Potassium iodide	0·6 ,,
Emulsion gelatine	1 ,,
Distilled water	100 c. c.

B.

Silver nitrate	8·1 grammes.
Distilled water	100 c. c.

After melting the swollen gelatine, both solutions being heated to 50° or 60° C., B is poured in very small quantities into A in the dark room, being well and often stirred meanwhile, set in boiling water for half an hour and also well stirred, then allowed to cool to 40° C., 4 c. c. ammonia added and again well stirred up, allowed to cool further for half an hour or warmed in a water bath not oves 40°C. After that 64 c. c. of the fluid is poured up 4 litres of warm water not over 40 C., well stirred, filtered, and after standing for one to two hours, the silver iodo-bromide is left to settle as described before. After drying, the plates must be washed for a time in standing or quietly flowing water, which at first is frequently changed.

IV.—The Settling of the Silver Bromide.

Glass developing trays with flat bottoms made of moulded glass are suitable for settling the silver bromide. The inside dimensions of the bottom should be at least $\frac{1}{2}$ of an inch larger than the plate. After a good cleaning with sulphuric acid, the dish is filled to about three-fourths its depth with the filtered bromide solution, and the plate, dusted on both sides with a soft brush, is laid down so that it is at least $\frac{1}{2}$ of an inch from the farthest edge. The time required for settling varies according to the preparation of the silver bromide. As soon as the edges of the plate can be seen through the fluid it is time to empty the dish and dry the plate. The dish is inclined forward and the fluid runs off with a syphon reaching to the bottom of the dish in front of the plate. The remaining solution is soaked up carefully with blotting-paper from one corner so as not to damage the surface of the plate. The plate can then be taken out of the dish. Care must be taken not to touch the film with the fingers. If the film contains gelatine, it will contract for some distance round the finger mark and probably damage the coating. The plates should be taken out of the dish by the edge and held by the lower side, and, besides, be kept as horizontal as possible. Then they are laid to dry in a place free from dust, but in a drying box as for gelatine emulsion plates. A few hours are sufficient. The plates dry more quickly standing, only the film is easily split by so doing and shifts away in places; or the heavier particles may move downwards and cause furrows which will develop as transparent lines with denser edges.

The Dry Plates.

(*a*) *Before Exposure.*—In drying, the sensitive coating of the plates will be distinctly more transparent for the optically light rays, especially if the silver bromide contains gelatine. I have had plates which while wet were only translucent, but after drying were completely transparent to my dark-room light (stearine candle light filtered through three thicknesses of brown tissue paper).

After drying, silver bromide containing gelatine adheres very strongly to the plate, pure silver bromide on a gelatine coating is not so good, especially with a thick coating, and on a plain glass surface makes such a loose deposit, that its employment for photographic negatives is attended with great difficulties. However, when once they are dry, these plates can be set up standing in water to remove the potash salts in the coating, which is as necessary in this as in the other preparations.

The coating is very sensitive to mechanical pressure. It will even

* I have obtained better results with plates containing about 10 parts of silver iodide to 100 parts of silver bromide, than with any other plates. For photographing the most refragible rays of the new spectral region I have only used bromo-iodide plates. It should, however, be mentioned that a year elapsed between the preparation and the exposure, during which time the specially high sensitiveness may have been acquired by an after ripening.

scarcely bear dusting with a brush without injury. To direct pressure it is generally less sensitive. When cutting with a diamond, the rule may be laid direct on the sensitive side without fear of injury to the film. Under still stronger pressure many sensitive coatings change their properties. I come to this conclusion from the fact that plate numbers stamped on with a soft rubber stamp always develop intensely black, whereas the same way of marking in all other cases gives the numbers as clear as glass.

The colour of the coating of the plates is, with silver bromide, white, with a trace of yellow; with mixture of silver bromide 100 and silver iodide 5, somewhat yellower; with the bromide and iodide in the same proportions, precipitated together from the same solution, citron yellow, and, with 10 parts of iodide, light orange yellow.

Pure silver haloid gives a dull coating; with gelatine it is more glossy. By the light of the dark room it generally appears faultless, except at the edges, which show uneven streaks. By daylight, however, it is different, and fogginess and unevenness of the deposit may often be noticed. On development these appear as dense spots unless certain precautions are very carefully observed. Moreover, the film always contains some particles of dust, however carefully the plates may be prepared, and under the microscope these spoil the image, and sometimes render it useless. Fortunately this only happens when the image of a line taken with a very fine and short slit opening falls upon impurities, and so becomes uncertain.

(*b*) *The Photo-Chemical Colouring.*—My observations will here be confined to films containing gelatine, and even with these only to a few tried in direct sunlight. In presence of sunlight, the sensitive films are affected differently according to their composition.

Silver bromide is coloured at first greenish blue, and becomes grey blue without gaining greater intensity. If only part of the plate is exposed, this appears surrounded by a greenish-blue aureola, the result of total reflection, by which the rays are thrown off from the back of the plate, A mixture of iodide and bromide darkens much more strongly than pure silver bromide. It becomes grey blue and shows only a trifling halo. The iodide and bromide precipitated together takes a still more intense grey blue colour and shows almost now aureola.

(*c*) *The Photographic Colouring.*—The colour acquired in development by plates sensitive to the ultra-violet is, as is universal in photography, quite different to the photo-chemical colouring. For development only pyro and soda are used. With normal exposure, the film of silver bromide is coloured grey black, while that of the bromo-iodide is blackish-brown. However, by suitable dilution of the developer, both may be made darker and more intense. Of this more anon.

If a full exposure is given, the image sometimes appears light brown and is bordered with dark brown. If the exposure is still further increased, solarisation take place. The exposed parts appeared transparent, almost like clear glass, in the middle of an extensive halo; for this I have burnt 25 cm. of magnesium ribbon, one to two centimetres in front of a plate, covered with a perforated screen. If the plate is prepared with silver iodide and bromide precipitated together, there is no solarisation (I have used plates containing 5, 10, and 20 parts of Ag. I to 100 parts of Ag. Br.). The exposed surface is then strongly blackened, and stands out strongly from its wide transparent surroundings. This was also the case with prolonged exposures. All these experiments were made with plates containing gelatine. I have also tried silver bromide plates containing agar-agar, but found that they solarised even more readily than the gelatine plates.

VICTOR SCHUMANN.

(*To be continued.*)

COLOUR IN NEGATIVES.

THE great recommendation of our more modern developing agents is generally held to lie in the immunity from yellow colour or stain attained by their use. I think it is pretty well admitted on all sides that pyro-gallol will do very nearly all that amidol, metol, rodinal, *et hoc genus omne*, can accomplish. Our old friend, though, arrives at his results by a somewhat different method. For instance, if we wish to get all possible detail out of a plate suspected of under-exposure, we naturally keep the pyro very low, so that the high lights may not acquire undue density. This involves protracted development, and, as a natural sequence, a considerable amount of yellow stain in the negative. Supposing the same plate were to be developed by the agency of metol, there would be no occasion for the dilution of the developer; rather should we strengthen it, because a concentrated, unrestrained metol developer will flash up all detail at once, and only take on density very gradually, enabling us to stop development at the right moment.

If two such negatives are compared, there will be a great difference, visually. The metol-developed plate will be of an even grey colour in the greater deposits of the high lights that will make it very acceptable to the eye, especially when the total absence of deposit or stain in the deepest shadows is taken into account as well. Altogether, it will present a great and pleasing contrast to the pyro-developed plate. This latter will, on comparison, have an almost objectionable appearance, entirely arising from the difference in the colour of two deposits and the stain over the whole surface of the gelatine.

But negatives are not made to look at; they are simply a means to an end; they are an unfortunate necessity on our way to produce finished prints. Therefore, the two negatives shall fulfil their mission, and shall yield us prints—for simplicity's sake, silver prints. The pretty-looking grey negative will soon be printed deep enough for toning; but we shall have to wait for the yellow one. When it is done, we may proceed to finish them in then usual way; but already, before they are put into the first washing water, there is a very noticeable difference, and the boot is on the other leg now. The prettier-looking negative (as far as colour is concerned) does not give the better-coloured print of the two; quite the reverse, in fact; and, when toned, the difference is still more pronounced, because the slower-printing negative gives a print that takes on an entirely different range of tones to the other one. The experiment will probably end with a decision on your part that there is still a deal to be said in favour of pyro as a developer.

I do not say that this little experiment is theoretically and scientifically correct. It can be argued, with a good show of reason, that the personal equation had not been eliminated; that, for comparative purposes, the two negatives should have been developed in such a manner that the opacity of the highest lights was similar in each one *by measurement*, and not by judgment; and that the metol-developed plate was, in reality, under-developed. Exactly so; but theory is not practice. In the dark room, when developing our beloved snap-shots or less lovable, but more remunerative, studio exposures, the personal equation is the all-important factor. We cannot use an apparatus for measuring densities during ordinary development, we are obliged to use our eyes; and, finally, most metol-developed negatives *are* under-developed by reason of these things.

But, given two negatives which shall be measured and proved of equal opacity in the highest lights, and with equal range of gradation throughout—one of which shall have the familiar pyro stain and the other be totally free from it—I have yet to be convinced they will yield prints identical in colour, richness, and quality.

Now, after all this, you will be somewhat surprised, perhaps, to hear that I use metol frequently, but I put it *into* the pyro developer, where its good qualities are utilised without the drawbacks mentioned.

There is moderation in all things (there should be, at least); certainly it is so in the amount of yellow stain permissible or advantageous in a negative. For this reason I never had a great affection for pyro ammonia. I do not care for a negative that takes a week to print in winter and a good hour or hour and a half in brilliant summer sunlight. True, the use of sulphites will control it, but, just when the action of sulphites in the developer was beginning to be generally understood, I took a great liking to the use of carbonatee as acceleratore. I have never lost that liking, and have only used ammonia when really driven to it.

It is more particularly to the power that exists of moderating and controlling the amount of colour in a negative developed by pyro soda or pyro potash that I wish to call attention. I will presume that a developer is in use composed as follows:—

Pyrogallol	.....	2 grains.
Potassium bromide	.....	½ grain.
Soda carbonate	.....	14 grains.
Soda sulphite	.....	9 ,,
Water	..... up to	1 ounce.

Modifications of this developer will act in a similar way, but it will simplify matters if I name a standard and explain its actions. The modifications referred to may be the addition of further bromide or the omission of it entirely; the addition of metol or amidol, as taste may suggest, or the substitution of an equivalent quantity of potassium carbonate in place of soda carbonate. I may also say that, although I have not tested the reactions subsequently mentioned in the case of pyro ammonia (plus sulphite) developer, I believe they would be much the same.

And now a word or two about compounding the above developer. I entirely agree with the *dictum* laid down by the Britannia Works Company as to the function of a sulphite in the developer. It should *not* be used as a pyro preservative, but is simply present in the developer for the

purpose of controlling the amount of colour that shall be present in the finished negative. Therefore, in practice, I make up two solutions, one containing pyro and bromide, the other carbonate and sulphite. As to preservative, a few drops of nitric or sulphurous acid may be included in the pyro stock solution if necessary, but this is not often in my case. I find that, if an ounce of pyro be dissolved in forty ounces of water, it will not keep above a couple of days; but, if you dissolve half an ounce of potassium bromide in the water first, and then add the pyro, it has much greater keeping qualities. It is always fit for use at the end of a fortnight, and I have used it three weeks old without finding any noticeable loss of energy. The solution certainly acquires a slight brown tint, but it does not become muddy, as a plain pyro solution does. (I do not remember having seen or heard any reference in the photographic press to this preservative property of the soluble bromide, but it is a fact, nevertheless.) So you see it will depend on the amount of developing you are likely to get through. If you are so constantly at it that an ounce of pyro will not last you much more than ten days, the acid is not necessary; if you only do a little developing now and then, it will have to be used; but omit it if you can, as it has a slight restraining action.

W. E. A. DRINKWATER.

(To be continued.)

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News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, April 14, at eight p.m., at 12, Hanover-square.

WE congratulate our friend, Mr. F. A. Bridge, who, on April 2, was married to Miss E. M. P. Harding, a lady well known and respected in the photographic world. She has been engaged in the practice of photography for some years, and formerly belonged to the old South London Society. We wish Mr. and Mrs. Bridge every happiness and success.

MR. J. A. C. BRANFILL writes: "I notice that, in your article on *The Use of the Swing Back in Enlarging* on the 20th ult., you say there exists no ready means for calculating the position of the negative in order to secure at once perpendicularity and sharpness. I think you will find the formulæ I gave you (see page 703 of your last volume) will provide a ready means for that purpose as well as for determining the position of enlargement."

A PHOTOGRAPHIC CLUB FOR DUNFERMLINE.—A meeting of those interested in photography was held in No. 1 Committee-room, St. Margaret's Hall, on Thursday, April 2, Mr. J. W. Robertson presiding, for the purpose of forming a photographic club for Dunfermline. The proposal was unanimously approved of, and Mr. William Hutton, Teller, Bank of Scotland, was appointed Secretary and Treasurer of the new Club, which it is thought will, ere long, have a membership of between forty and fifty.

MR. C. C. VEVERS, of Leeds, writes: "I shall be obliged if you will notify my change of address after April 1 to 163, Briggate (a few doors below Duncan-street), which I have had entirely refitted and lighted with electricity. My second-hand showrooms and printing and enlarging department are also on the premises. I have taken workshops, with provision for forty or fifty benches, in Lambert's-yard, behind shop, and Proctor's-yard, Call-lane, which I shall shortly have in full working order. Customers whose orders have been delayed during removal, please accept apologies and assurance that they shall now have immediate attention."

A BOOK FOR PAINTERS.—We are informed that Mr. Hector Maclean has now in the press a handbook, entitled *Photography for Artists*, which, adorned by many illustrations contributed by artists and photographers, will probably be not only a useful guide to all who lean upon photography for illustration, decorative design, or picture painting, but also a work which will contain much to please the eye. Especially interesting are Mr. Linley Sambourne's photographs, and the line work founded thereon. Amongst the several distinguished photographers whose prints are reproduced are Dr. P. H. Emerson and the late Colonel Stuart-Wortley.

PHOTOGRAPHIC INFLUENCE UPON PAINTING.—The reform and improvement brought about by the camera as regards truthfulness of rendition in the various walks of pictorial art have not of late been more emphatically illustrated than by the numerous scenes—numbering almost four hundred—by means of which M. Tirrot depicts the history of Christ. These are now on view at the Lemercier Gallery, 35, New Bond-street, and are well worthy a visit, not only on account of the consistent and vivid manner in which they tell the story of the Redemption, but because they typify the still-growing demand for complete actuality. This M. Tissot appears to have been able to supply, by means of a ten-years sojourn in Palestine. Other painters often find that they can satisfy the popular craving for realism by the more convenient method of working from photographs.

TO PREPARE A TRANSPARENT MIRROR.—The following process for producing a mirror which reflects from one side, but is transparent from the other, has been patented in Germany:—Dissolve 1 part by weight of silver nitrate in 10 parts by weight of water, and label No. 1. Prepare another 10 per cent. solution of silver nitrate, but in larger quantity. To this add ammonia water, drop by drop, stirring carefully until the precipitate formed at first is completely dissolved, and label No. 2. Now add solution No. 1 to solution No. 2 until the odour of ammonia is no longer recognisable, and the liquid has again become very turbid. Now add 100 parts by weight of distilled water for every part of silver nitrate originally used in solution No. 2, and filter until clear. Label this No. 3. Prepare a reducing solution by dissolving 0·8 part by weight of Rochelle salt in 384 parts by weight of distilled water, boil, and to the boiling solution add gradually a solution of 3 parts of silver nitrate in 10 parts by weight of distilled water, and filter when cool, and label No. 4. Clean the glass to be coated thoroughly, lay it on a perfectly level surface in a room at a temperature of about 25° C. (77° Fahr.). Mix equal parts of No. 3 (the depositing fluid) and No. 4 (the reducing fluid), and pour over the glass. The glass may, if preferred, be dipped into the solution. The time required for the deposition of the layer of silver of just the correct thickness has to be determined by the judgment of the operator in each case, and this may be aided somewhat by observing a piece of white paper below the plate of glass. When a sufficient deposit of silver has been made—and much less is required than for an ordinary mirror—pour off the silvering liquid, and rinse thoroughly with the distilled water, and stand the mirror on edge to dry; coat the silvered side with a solution of colourless shellac in alcohol, and finally frame the mirror with a backing of clear glass to protect the mirror surface from being scratched.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
13.....	Camera Club	*Bird Life.* R. B. Lodge.
13.....	Lantern Society	Exhibition of Members' Slides.—Exhibition of Selection of Commander Gladstone's Slides of Venice.
13.....	Oxford Camera Club	*A Talk about Successful Portraiture and Platino-bromide Papers.* Nahum Luboshez.
13.....	Richmond	Lantern Evening.
14.....	Hackney	*Pictorial Work with the Hand Camera.* W. Thomas.
14.....	Royal Photographic Society ..	Ordinary Meeting.
15.....	Leytonstone	Discussion: Outings, Season 1896.
16.....	Bradford.....	Exhibition of Apparatus.
16.....	Camera Club.....	*Elephant Hunting in the Nepaul Terrai.* Colonel F. T. N. Spratt.
16.....	Darwen	Platinotype Demonstration. S. Mitchell.
16.....	Leeds Camera Club	Social Evening.
16.....	Liverpool Amateur.....	*From Mount Blanc to the Matterhorn.* W. Lamond Howie.
16.....	Oldham	Enlarging. The Members.
17.....	Moseley and District	*Why?* Mr. Predden.
18.....	Leytonstone	Excursion: Boleyn Castle. Leader, A. Woodcock.

PHOTOGRAPHIC CLUB.

APRIL 1,—Mr. S. H. Fry in the chair.

Mr. HORACE WILLMER said that the widow of the late Mr. Bedford had informed him that she proposed to have an enlarged photograph of her late husband made, and she would offer a copy to the Club as a memorial of him.

The CHAIRMAN, in suitable terms, expressed the pleasure that he knew the members of the Club would feel in having a picture of their old friend placed in the Club-room.

Mr. GOTZ brought forward a proposition that there should be a summer outing of the members and friends of the Club, to take place somewhere about midsummer. He said that the outings of the Club, which were at one time a great feature of its life, had fallen somewhat into desuetude. He thought that a small committee, having the projected scheme at heart, could arrange for a whole day's outing, and that suitable arrangements for a meal in the evening could be included.

After some discussion as to whether the outing should take place upon a Bank Holiday or a Saturday, it was arranged that a whole day's outing of the Club should be held at or about midsummer. Arrangements would be made so that those who chose, or who could only spare half a day, could join the excursion. It was left to Mr. Gotz to bring the matter forward against an early date, when a committee could be appointed, and the final arrangements made.

In the absence of Mr. Wall, the paper of the evening fell through, but the question of the influence of

THE COLOUR OF A NEGATIVE UPON ITS PRINTING QUALITIES

was formally discussed.

Mr. JAMES CADETT, who opened the discussion, described, with blackboard illustrations, some of the principles upon which density measurements are made, and discussed the way in which the colour of the deposit affected these measurements. He said that the question of the colour of the negative as regards its speed was not an unimportant one, because it was often the case that the visual density of the negative was by no means an index of its printing density; in other words, the negative may appear very dense, and yet not be a good printer. He pointed out that the difference in colour of deposit of a

negative might appreciably alter the number of steps of gradation, while it would not affect that portion of the Hurter & Driffield curve which is known as the period of correct exposure, and so, in reading the speed by the graphic method, the straight-line portion of the curve would cut the base of the diagram at the same place, and the speeds would read alike. After dealing with the inertia of a plate, and explaining that, whilst the exposures increase in geometrical progression, the density deposit augments in arithmetical, he went on to say that, after considering the matter in its practical bearings, he considered the question of colour or stain was not a momentous one. It was possible there was a stain image, and also a silver image. If there were any advantage at all, it was in favour of an image with a certain amount of stain. He thought that, as far as portrait negatives were concerned, it was necessary that they should not be stained, but that they should be made in a colour as nearly as possible representing the pencil which was used for retouching.

Mr. A. COWAN agreed generally with what the previous speaker had said. He thought that the stain did go equally through the negative, although it might be more apparent in the shadows than elsewhere. Perhaps it was covered up by the heavy deposit in the higher lights. He instanced the case of green fog, which was only visually obtrusive in the under-exposed or shadow portion of the plate. Notwithstanding this, he thought the green fog did go right through the plate, but that it was less noticeable in those portions where there was more deposit.

Mr. FRY said that it was perhaps unfortunate for the Hurter & Driffield method, of the main principles of which he was entirely convinced, that certain statements had been attributed to the authors—whether rightly or wrongly—which did not affect the question and which statements were known to be, if not incorrect, at least exaggerated. He also took the occasion to deplore Mr. Cadett's own action in using the double series of speed numbers. He thought it most unfortunate that what was after all only an arbitrary standard for each maker's own plates should be confused by the addition of an extra set of numbers which could serve no useful purpose whatever. The value of the numbers consisted in the fact that, if one box of plates was marked 100 and another 200, the latter might be assumed to be twice the speed of the former, and no advantage that he could see was gained by doubling the numbers, but some confusion might well arise.

Mr. HODD agreed with Mr. Fry, and put his objections into a concrete form.

In reply, Mr. Cadett said that users of his plates had complained that they were under-speeded when he had used the standard ferrous-oxalate developer for arriving at the Hurter & Driffield number. He went on to say that, with recent samples of pyro, he had found the speed of plates to be three times as fast as with the Hurter & Driffield standard development, and he suspected that makers of this developer might be mixing it with one of the newer developers, such as metol, or in some way varying it. In any case, he noted the fact that, with some makers, or, rather, with some batches of pyrogallic acid, he got higher speed results than with others.

Mr. FRY said that he thought this entirely supported his argument that the second speed number was a mistake, as the only logical course for Mr. Cadett to adopt now would be to add a third set of speed numbers for the more rapid pyrogallic acid. This would tend to reduce the whole system to an absurdity. It was an interesting fact, however, to hear it stated on authority that one sample of pyrogallic acid worked faster than another.

Mr. COWAN said that the Committee of the Royal Photographic Society, which had dealt with the question of speed determination, was thoroughly agreed upon one thing, viz., that the only correct method of speed determination was that one which tested the particular plates with the particular developer with which they were to be used.

Mr. CADETT said that Hurter & Driffield were undoubtedly wrong when they said that all developers gave equal speed.

Brixton and Clapham Camera Club.—March 24.—Mr. R. C. WHITING, of the Ealing Photographic Society, spoke on the

IMPROVEMENT OF LANDSCAPE NEGATIVES,

having, on a previous occasion (February 25), dealt with the retouching of portrait negatives. At both meetings a good attendance was present to benefit by his instruction. In his introduction Mr. Whiting said most portrait negatives underwent retouching. The necessity for this can be understood when we consider the inadequate sensitiveness of the ordinary plate to such colours as red, green, and yellow, and its over-sensitiveness to blue and violet, although this difficulty is partly got over by using orthochromatic plates. Again, the camera has a tendency to exaggerate and accentuate lines and wrinkles such as are caused by age, &c., and to remove this exaggerated effect is the retoucher's work. Difficulties are also met with in lighting the subject and in development, and here once more the negatives are susceptible to after-improvement. It may be objected that this is not photography, and where an unlimited amount of work is put upon a negative, sometimes to such an extent as to destroy any characteristic likeness it may have possessed, there is good reason for this objection, but to legitimate retouching for the removal of blemishes there can be none. The great thing is not to attempt too much; to do too little is far better. Many retouching desks are faulty; they have mostly a want of size and stability, and have too much incline, which is tiring to the hand. The desk should be placed at such a height as will avoid stooping on the part of the operator, a practice which is not conducive to good work. The elbow must be placed on the table, the hand allowed free play, and care taken to place no weight on the pencil. All light, except that passing through the negative, should be cut off, and, in place of the ground glass usually placed behind the desk for a reflector, a piece of deeply flashed opal may, with advantage, be substituted, as this better shows the effect of the lead in relation to its printing value. The hand ought to be kept from the negative, as a better command over the pencil and more power of manipulation is obtained, and the negative should be lowered or raised, and placed at any required angle. The brush and colour and black chalk are useful for large work where a bold touch is wanted. The work requires fixing with isinglass, squirted from a scent spray, or with indiarubber solution. The pencil will, however, be more generally useful, those of B. S. Cohen being especially good. HB and HH will be found about right for average work. For retouching the face, the pencil is sharpened to a long, thin, needlelike point, a shorter point being used where a bold, heavy touch is wanted. A medium can be done without if the negative is coated with a soft varnish, allowed to dry, and then rubbed with the finger until rough, but the negative often won't take sufficient lead by this method. When a medium is used, don't rub in with the finger, but place a few drops on a handkerchief and allow to dry, then add a few drops more on the rag, and, placing the finger over, rub with a circular motion on the negative until the rag sticks and is difficult to move. If worked too much, the medium won't take the lead; if too little, it takes it too thickly, and in dots. Mr. Whiting next showed how retouching is carried out in practice, how and where the lead should be applied to produce the required grain and light-and-shade effect, how high lights could be scraped down with a sharp knife, Indian ink and Payne's grey used to fill in scratches in the film, &c. He also emphasised the necessity of a knowledge of anatomy and drawing to any one undertaking retouching. For retouching landscape negatives, a knowledge of the laws of art is essential to success. The most suitable process for a particular negative should first be chosen, then a print taken in that process, the same as that in which the finished picture will be produced. The principal point in landscape work is the proper light and shade balance. As a rule, the centre is the weakest part of the picture, and on no account should the strongest light come in that position. The print can usually be trimmed to avoid this, then the negative is retouched so as to strengthen the lines where advisable, or subdued so as not to over-assert themselves. As a rule, the sky also wants treatment. Even if clouds are present in the negative, they are mostly in a wrong position, and it is better to mask them out and print in clouds from a separate negative, or else to manufacture artificial clouds, which can be done by varnishing the negative with white hard varnish, thinned with turpa, allowing five or six hours to thoroughly dry, then rubbing the finger (dipped in powdered resin if handy) over the surface of the negative until it looks like ground glass, rubbing off the powder with a little cotton-wool. Clouds can then be placed in with a stump dipped in electrotyping plumbago, and the print rubbed on a bit of washleather. Clouds may also be put on the back of the negative, but are generally objectionable, inasmuch as they print with no definite outline, but with a woolly appearance, unlike any natural cloud form. A very non-actinic colouring for the back of the negative consists of putty mixed with yellow ochre and chrome yellow. This is dabbed on where required. Matt varnish can also be used, and should not be scraped away except where there are dark shadows (as the trunk of a tree). It is occasionally useful to cover the back of the negative all over with matt varnish, and work on it with the cravon stump, but better results can generally be got by working on the film. Mr. Whiting was listened to very attentively, and replied to numerous questions, also suggesting how various prints handed to him could be improved. Asked whether it is possible for an amateur to successfully retouch his own negatives, he said yes, as the ability to make good photographs would also enable him to exercise the required judgment and tasts in remedying their defects. Mr. Thomas, in proposing a vote of thanks to Mr. Whiting, testified to the great pleasure he had received from his address, and cautioned the inexperienced against attempting too much. The beginner should learn how to obtain such a control over his materials as to render little retouching necessary, there was nothing equal to "good old nature," after all, and in printing in clouds he considered far better results were generally obtained by using a real cloud negative than by working on the film. The subscription list opened in aid of Mr. W. H. Harrison was referred to. Mr. Harrison is a member and past Vice-President of the Society, and many members have pleasureable recollections of the great interest he has always taken in it, of his readiness to assist in filling up the programme, and of the many valuable papers he has read to the Club, papers which must have cost him an inconceivable amount of labour. It is certain that many members will desire to contribute to his assistance now the necessity for it has arisen, and any sums sent to the Secretary for this purpose will be very welcome.

Croydon Camera Club.—April 1, the President (Mr. Hector Maclean) in the chair.—The subject was

HOW TO MAKE A GOOD NEGATIVE,

being the second of this season's Novices' Nights. The matter was opened by a short address from the PRESIDENT, in the course of which he urged on amateurs that the well-worn advice, to "choose a plate and stick to it," should be discarded. Where, as with the ordinary amateur, the camera is turned upon all kinds and conditions of subjects, it is absolutely needful that one should be able to intelligently handle various makes of plates; to know what one particular brand will do, and how it needs humouring, is insufficient, the knowledge must be extended to a familiarity with several leading types, such as extra-rapid, slow, extra-slow (photo-mechanical), isochromatic, and anti-halation. Moreover, the amateurs should know why and when a thickly-coated plate is preferred over a thinly coated one, and *vice versâ;* he should also be aware that the two require some difference of treatment as regards development. Many of these points were touched on, which cannot be here reported. Messrs. S. H. Wratten, A. E. Isaac, W. H. Rogers, J. Smith, and others took part in the discussion; after which Mr. JENKINS gave a practical demonstration for the benefit of such novices as were present. Messrs. H. T. Marey, H. Davies, and J. C. Taylor were elected members.

Richmond Camera Club.—At the meeting on the 30th ult., Mr. Purcell presided, and a very full and interesting demonstration of

THE PLATINOTYPE PROCESS

was given by Mr. STRINGER, of the Platinotype Co. At a meeting on the 1st inst. it was decided to form a cycling section in connexion with the Club, with a general view to cycling and photography combined, and a provisional committee was appointed with Mr. Gibson as Captain, and Mr. Richards as Vice-Captain and Secretary.

Woolwich Photographic Society.—March 26, Colonel C. D. Davies pre

siding.—Mr. J. C. S. MUMMERY (President of the North Middlesex Society) gave a paper on

MOUNTING AND FRAMING.

He commenced by giving hints on suitable mountants and their preparation, his favourite being freshly made starch. This should be allowed to cool, with a cover over it to prevent the formation of a hard skin on top, which generally broke into little lumps when being applied to prints. A little cold water poured on the top effectually excludes air, and makes a good cover. Passing on to mounts, he said that white card, as a rule, was too strong and bare for ordinary prints; but, if one or more lines were ruled round print, after mounting, with lead pencil, this bareness was overcome. Sometimes the desired effect can be obtained by using an extra thickness of glass. This was illustrated by a print, one portion of which was uncovered, and other portions with one and two thicknesses of glass respectively. In cut-out mounts there should be no fancy curves or ornament, or the eye is taken away from picture to decoration on mount. In large subjects and bold effects strong contrasts are allowable, but in ordinary subjects harmony is necessary. The general effect of a mass of colour is emphasised by placing against the complementary colour and *vice versâ*. Mr. Mummery here showed the effect of an orange-red mount and a grey mount, the red mount sharpening up the print, and the grey softening and accelerating the atmospheric effect. To increase appearance of gloss, use rough mount, and, for increase of matt appearance, use glossy mount. Do not write titles in ink, and very best writing in conspicuous place, but use pencil in unobtrusive corner. Two to three is generally considered best proportion for cutting mounts, but each print must be considered and tested by itself. Increase of width of mount and frame gives square appearance to picture; width of mount showing must not equal width of picture. For frames, broad and simple moulding is the best. The frames and mounts should be rectangular; any variation of this at once attracts attention to the frame, and takes the eye from the picture. Originally no frames were used for pictures; they were painted on walls, &c. It should be well considered where the picture is to be hung—at an Exhibition, or on a fancy wall paper. If for exhibition, it may fairly take its chance, but the colours of wall paper must be taken into account. When finished, the picture should arrest and give satisfaction to the eye; it should appear complete, and not give the idea of being abruptly stopped or cut off, and the eye should be entirely unconscious of mount or frame.

Bath Photographic Society.—March 25, Mr. George F. Powell (President) in the chair.—Mr. GEORGE NORMAN gave his promised lecture, entitled

A TRIP TO THE BALTIC.

He said the portion of his trip from Bath to Scandinavia need not be dwelt upon, but he would commence with the landing at Christiania. Views of the harbour were shown, then the important features of the place were described in detail, the customs of the people, their industries, simple habits of life, religious observances, pleasures, educational work, and domestic architecture, &c. Passing on to Stockholm, the lecturer similarly treated his subject, the whole of his remarks being copiously illustrated with lantern slides from photographs he took as opportunities occurred. Several views of Cronstadt, with its practically impregnable fortresses, and many Russian ironclads were shown, and interesting details concerning them given; but here, said the lecturer, photographing was strictly forbidden. St. Petersburg was next in order, and upon the magnificence of this great capital, its fine churches with immense pillars of granite and gilded towers, gorgeous palaces, shrines, theatres, and fine streets, the audience was well entertained with information the lecturer had been able in his brief stay to collect. Journeying to Moscow, a still greater wealth of splendour was presented; but the illustrations here, as also at St. Petersburg, were of Russian production, owing to the stringent police regulations in respect to touring photographers. Upwards of eighty pictures in all were displayed on the screen during the delivery of the lecture, which occupied nearly two hours.

Leeds Photographic Society.—In consequence of the Ordinary Meeting falling due on the day before Good Friday, it was resolved it should be held in the Society's rooms on Monday, March 30, instead of April 2. Some of the most prominent manufacturers of photographic apparatus having sent down their latest productions for exhibition and criticism, the meeting was opened with a display of their goods an hour earlier than usual. Special approval was shown of time and instantaneous, snap-shot, studio (a beautiful arrangement for silently obtaining children's pictures), and focal plane shutters, the patented articles of the Thornton-Pickard Manufacturing Company; also their new automatic tripod. The metal dark slide and dark-slide adapter (Edwards's patent), as well as sundry devices for carrying, exposing, and developing films met with a good share of appreciation. Amongst other articles worthy of mention were a bromide lamp (Groom's patent), a model of an improved sectional print-washer, specially designed to keep prints or negative films from contact with each other during their cleansing from chemicals which would affect their permanency. The "Zoppo" shutter commended itself to the admiration of the members for its ready means of adaptation to different-sized hoods, and the silent working of the shutter (a clever one of the ever-set type). One little novelty would have commended itself to the lady members, who, however, were conspicuous by their absence on this occasion, the later business of revision of rules, it being suggested, having something to do with their non-appearance. We refer to the rubber sensitive finger covers. Over half an hour was spent in amending the rules of the Society, copies of which will be forwarded to the absent members in due course. The event of the evening, however, was Mr. J. H. WALKER'S (ex-President) lecture on the

PHOTOGRAPHIC CONVENTION AT SHREWSBURY, 1895.

In his opening remarks the lecturer said the great idea of the age was centralisation. In business, in trusts (mining and otherwise), they found it and its result in a convention—a coming together of men whose minds were bent upon a common object. Now, men could not meet without sooner or later exchanging experiences. Book wisdom was not so practical as actual experience, and the men one met at photographic conventions were largely men of photographic experience; tyros there might be, fossils of prejudice also, but still you found the majority were men whose experience was material, the result of knowledge assimilated, which had become part of themselves. Hints from men like these were valuable, and they could not, therefore, attend a photographic convention and go away no wiser. They derived ofttimes very quickly the results of a year's labour. The Convention at Shrewsbury was no exception to this rule. Not from papers so much as from contact on excursions, casual meetings with notables in one or other departments of practical photography, did one benefit, and he would like all who heard him to avail themselves of the opportunities afforded by the coming Leeds meeting for economical reasons as well as others. He hoped they should have above 200 members of convention, then, with a similar number of strangers, the city will break the record. Mr. C. M. Hayes, in the *St. Louis and Canadian Photographer* of last month, gave the following recipe for getting the greatest good out of a convention: "Mix a little application with a vast deal of comprehensive listening, add willingness to learn. When this is in the right condition, flavour it with a determination to profit by what you hear and see." The tenth Convention was held at Shrewsbury, the previous ones being held in London, Dublin, Derby, Birmingham, Edinburgh, Bath, Plymouth, Chester, and another town. What struck him at Shrewsbury was the variety of the place itself, the excursions to various places around, and the amount of detailed arrangement, which must necessarily have fallen on the local Committee, far more than would be the lot of the Committee over which he had the honour to preside. This multiplicity of attractive show places led to the Conventioners being divided into somewhat small parties. In the Leeds Convention he thought they would find larger parties would assemble, simply because there were fewer places in their immediate neighbourhood—plenty of railway journeys, but few by road. The Convention might be looked upon as partly of a business and scientific character, but the social element had, after all, the strongest hold on the community. Fifty per cent. might attend the business meetings, ninety per cent. the reception, and about twenty per cent. the scientific papers, the social function being the attractive feature. Here they witnessed the reunion of old friends, every one doing their best to make the meeting agreeable. Sometimes a jarring note was struck, but it only prepared the ear in a Wagnerian fashion for fine harmony, to say nothing of uproarious merriment. While introductions went on apace at the meeting-rooms at headquarters hotel all day on Monday (such introductions being obviously desirable), still the badge of membership was always a passport to free conversation, and it was considered the proper thing to wear the badge on all occasions during the Convention. After detailing the week's programme at Shrewsbury, the lecturer said he took the opportunity the other day of suggesting to Mr. Ives, of Philadelphia (the apostle of colour photography), how glad they should all be to see him in Leeds in July, and he said he would try to come, when he hopes to again have the pleasure of seeing his triple electric lantern for colour projection, as used in his demonstration at the Photographic Club in London on the 4th ult. There was a large gathering of Conventioners that evening. At the close of his address, Mr. Walker further entertained his audience by showing, by means of the oxyhydrogen light, 145 pictures of Shrewsbury, its inhabitants, its surroundings, and Convention visitors. Many of these slides were of great historical and architectural interest. Not a few were contributed by Messrs. Washington Teasdale, J. S. Teape, T. C. Hepworth, W. D. Welford, and Mrs. Catherine W. Ward, for the loan of which transparencies the lecturer acknowledged his indebtedness.

Liverpool Amateur Photographic Association.—The first excursion of the season took place on Saturday, March 28, when a large party, including several ladies, journeyed to the pretty village of Bidston, under the leadership of Mr. H. Holt. Unfortunately, the weather was all against good results; but, in spite of this, many good pictures were obtained, and the outing greatly enjoyed.

Sunderland Photographic Association.—This Association has, during the past month, made a record for itself in the number of specially interesting meetings arranged, all of which have been well attended. On the 12th Mr. W. Parry, of Shields, gave a paper on the retouching of both landscape and portrait negatives. On the 18th a non-competitive Exhibition was held, confined to members, when about 300 prints were hung, besides albums and stereoscopic slides. A number of lantern slides were also shown in the lime-light lantern. On the 26th Mr. John WATSON, of Newcastle, read a paper on

ROUGH-SURFACE PRINTING PAPERS,

treating of platinotype, mezzotype, Venus paper, &c. The chief attraction of the month, however, was the lecture, delivered on the 31st, by Mr. H. SNOWDEN WARD, on

THE RÖNTGEN X RAYS,

which was listened to with great delight by several hundreds of persons. At the conclusion of the lecture a child was brought which had run a needle into its foot. This was successfully radiographed by Mr. Ward, the result showing the position of the needle.

Edinburgh Photographic Society.—March 26, Mr. J. C. Oliphant, and afterwards Mr. A. Eddington, presiding.—This meeting is usually devoted to the exhibition of lantern slides, the work of members, done during the past season, and on this occasion about 160 slides were shown, Mr. JAMES PATRICK reading the notes in connexion with them. The exhibition of slides being over, Mr. H. SNOWDEN WARD gave a lecture on

RADIOGRAPHY.

Mr. Ward showed the latest improvements which had been made in the apparatus used in connexion with the New Photography, among others an improvement which he had himself made in the form of the vacuum tube employed. A number of slides were shown to illustrate the lecture, many being positive, instead of the usual negative, transparencies. Perhaps the slide which attracted the most attention was one made from a photograph taken by Mr. Ward himself, showing a child's hand with a supplementary thumb. By means of this photograph the doctors were enabled to decide whether amputation was advisable or not.

April 1, Monthly Meeting, Mr. J. Anderson presiding.—Mr. J. Ivesson Macadam, F.R.S.E., F.I.C., F.C.S., gave a lecture on

Light,

using the lantern [to illustrate. After the lecture, for which Mr. Macadam was heartily thanked, the medals won at the recent Exhibition were presented,

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is take of communications unless the names and addresses of the writers are given.*

FLUORESCENT SUBSTANCES IN X RAY PHOTOGRAPHY.

To the Editors.

Gentlemen,—For the last few months I have not been in the focus of X rays, and consequently not familiar with all that has been published on the subject. I note that Mr. Edison has been experimenting with various substances to render these mysterious rays visible, and that he has succeeded by the use of a calcium preparation. This reminds me that about ten or fifteen years ago I suggested and published some experiments I made with luminous calcium sulphide added to an emulsion of silver bromide, with the view of increasing its sensitiveness. This I succeeded in doing to a remarkable degree, but difficulties arose that seemed almost insurmountable. The only person I heard of who took some interest in the process was Mr. T. Bolas, and he suggested a vitreous preparation of the sulphide, doubtless to prevent a chemical action between the silver and sulphide. My object in penning this is to suggest that great rapidity, or some other effects, may take place by passing the X rays through a layer of the phosphorescent calcium sulphide.—I am, yours, &c.,

Monte Carlo, April 4, 1896. A. L. Henderson.

THE ARTIGUE PROCESS.

To the Editors.

Gentlemen,—In the last issue of your Journal, Mr. "Dogberry" gives us some interesting theories about the bichromated gum process. They are but theories; the whole discussion lies in a nutshell.

Mr. "Dogberry" allows that bichromated gum can give detail, but he maintains that it cannot give gradation and half-tones. I maintain that it can yield gradation and half-tone as well as any other process.

I have worked on this process patiently for more than a year; Mr. "Dogberry" has not. He gives us theory; I can talk from practice. He can show me text-books, but I can show him prints, and shall be glad to do so, if he will favour me with his real name and address.

I am certain that this gentleman, after having seen properly developed prints on properly coated paper, will go back on his wholesale condemnation, and allow that the delicate gradation of the moirée and the delicate rounding of a plump cheek are not forbidden to the worker of the bichromated gum process. If it *was* forbidden, nobody with the least artistic feeling would either use or advocate the process.—I am, yours, &c.,

13, *Rue François I., Paris, April* 6, 1896. Robert Demachy.

KINETOSCOPY ON THE SCREEN.

To the Editors.

Sir,—I have read the letter in your issue of the 27th ult. over the name R. W. Paul, but I decline to enter into a wordy contest with him. I will therefore content myself with a few statements.

Towards the latter end of 1894, Mr. H. W. Short (the Mr. S. of your correspondent's letter), who was a constant visitor at my house, informed me that he knew a man who was making Edison kinetoscopes, and who would do anything to get films, as the Edison Company would only sell films to purchasers of their machines. I believe that no patents were taken out on the Edison machine, the Company relying on the difficulty of the successful making of films, and, as machines were of no use without films, they made it a stipulation with the sale of films that they were only to be used with their own machines.

Mr. Short knew that I had invented an apparatus for taking (or printing, the principle is interchangeable) a number of photographs in rapid succession, and suggested that, if I were agreeable, he would introduce me to his friend, who would at his own cost make any machine I required, provided that I would supply him with films. Accordingly, Mr. Short introduced me to Mr. Paul. Mr. Paul admitted to me that he had no idea how to make such an apparatus, but that he would work out my ideas for me. I accordingly showed Mr. Paul how the thing could be accomplished, and made sufficient drawings to enable him to work the machine out. From that date until the machine was finished I attended at Mr. Paul's workshop every evening, modifying and superintending the manufacture of this machine. Mr. Short was only present on rare occasions.

I showed Mr. Short Mr. Paul's letter in your issue of the 27th ult., and he seemed very much surprised, and solemnly declared to me that he (Mr. Short) had not the faintest idea how to set about making such an apparatus before he saw my models and drawings, and he was equally certain that Mr. Paul had not; and, further, that he (Mr. Short) had had nothing to do with the designing of the machine.

Mr. Paul's letter would give your readers the impression that a kind of partnership existed between Paul and myself, and speaks of "our first saleable picture."

The truth is that, during the construction of the machine, Paul spoke of putting a large sum of money into the manufacture of films. I expressed myself willing, under such conditions, to give him a share in the venture, but, to my utter astonishment, when the machine was finished, Mr. Paul claimed a half share in it, and this without the slightest intention of putting a sixpence into it. I very well remember Mr. Short's surprise at this claim of Paul's. I finally agreed to appoint Paul agent, Paul agreeing to take a minimum number of films. Later on, Paul said he could not sell the minimum number, and so it became necessary for me to make other arrangements, which I accordingly did, having first cancelled the agreement with Paul.

If Paul thinks that he has any rights in the boat race or any other of my negatives, I would suggest that he makes copies of same in any shape or form, and publishes or makes any use whatever of such copies; we will then have an opportunity of deciding whose property they are.

In conclusion, I would only add that Mr. Paul has never seen one of my negatives, and has no idea, so far as I am aware, how I print and develop my pictures (my printing machine, which is a special one, being exclusively designed by myself and made on my own premises), my methods of handling film being also my own invention.

Apologising for trespassing on your space, but I could not allow such a letter to pass without laying the facts before you,—I am, yours, &c.,

Birt Acres, F.R.Met.S., F.R.P.S.

THE CATHODAL PLATE.

To the Editors.

Gentlemen,—We notice that on page 211 of your last issue you regret that little has been done in the direction of providing a plate for use with the Röntgen X rays. We would therefore bring to your notice our Cathodal plate, which we have specially manufactured, and are introducing for this work. This plate is made according to suggestions from Professor Oliver Lodge, and we hope it will greatly help the workers in this new photographic field.—We are, yours, &c.,

B. J. Edwards & Co.

The Grove, Hackney, London, April 7, 1896.

THE METRIC SYSTEM IN AMERICA.

To the Editors.

Gentlemen,—With reference to the above, you mention that several attempts have been made to introduce the metric system into photography, in this country, without success.

One cause for this is the inertia of the makers of plates, &c. For myself, I will *not* use grains, drachms, and ounces, which convey no sense of proportion, to my mind. On this account, I have asked several first-class firms to print the formulæ, which they recommend for their plates, in metric measures. In each case, the reply has practically been that they should like the metric system to be used exclusively, but that there is great difficulty, owing to the existence of weights and measures on the present system (or want of system), and that most photographers are accustomed to their use. I, personally, object to being coerced into using such a jumble as the apothecaries' weight, but should not desire to interfere with any one continuing to use it if so inclined. I would therefore suggest that plate-makers should give their formulæ in both measures, until the demand for the old method ceases.

If scientific writers would adopt the same plan, the value of their writings would be enhanced.—I am, yours, &c., Chas. Louis Hett.

March 31, 1896.

PHOTOGRAPHERS AND THEIR ASSISTANTS.

To the Editors.

Gentlemen,—In your issue of April 3 some very sound advice is given to assistants seeking employment. Much advice has been given—at different times—regarding specimens; but, may I ask, is there no need for a word of advice to masters? or is it a foregone conclusion that assistants are always to blame?

Your advice respecting marking specimens and enclosing stamps is very good, but even there I have found those, who will not, even under threats, restore the specimens sent. I think too it would be a boon to assistants out of employment if the advertisements were a little more explicit of the wants of the advertiser, and stated that important item, the wages to be paid, and, unless exceptionally long, the hours per day or week to be worked. In following the situations vacant from week to week, I often notice such advertisements as "Wanted————permanency to suitable man;' what kind of person is wanted I cannot tell, it certainly is not human, judging by the regularity some firms advertise the same want.

Some as regularly as the seasons have their advertisements, and always for permanencies. Assistants in work would do well to note such firms and beware.

Again, why should any respectable firm decline to state name and address? Often, and especially with assiatants who are married, the distance to be travelled is a matter of grave importance, and, had the assistant known the addreas, his specimens might not have been sent, and so saved that awful trouble of being returned.

To masters I say, State what you require, rate of pay and working hours, and honestly whether for permanency or season.

To assistants, Don't answer, and especially don't send specimens to constant advertisers or advertisements under cover, avoid all such, and don't send specimens above your average work; your average work is wanted, and your average specimens are least often stolen or "mixed."

There always will he the unscrupulous ones who will have an assistant travel from one end of the country to the other for two or three months' work, and assistants who over-state themselves, and are consequently soon "out" again; but much good may be done and trouble saved if those wanting assistants and those requiring situations, would each state clearly in the first instance what is required.

Those who act honestly and fairly are not the ones to be always changing or advertising; assistants in the present condition of trade are only too pleased to stay where they are treated respectably.

PROVINCIAL OPERATOR.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED :—

L. Varney, Bridge-street, Buckingham.—*Photograph of John Locke Stratton.*

F. R. Robinson, 138, Anerley-road, S.E.—*Two Photographs of Rev. Joseph Halsey.*

William J. Bishop, 15, Maygrove-road, Brondesbury, N.W.—*Photograph of Ribbon Lightning.*

J. Horsburgh, 131, Princes-street, Edinburgh.—*Two Portraits of the Most Rev. Angus Macdonald, D.D., Roman Catholic Archbishop of Scotland.*

RAYS.—C. RICHARDS. Your medical coil and battery are quite useless for experiments in the "New Photography," even if you added two more cells, or even half a dozen more, for that matter.

MOCK PLATINOTYPES.—SUSPICIOUS. The print sent is not a platinotype but a bromide print. If you immerse one of the others in a solution of bichloride of mercury, you will find the image will disappear. If it were platinum, there would be no change.

YELLOW TONES.—S. SHARMAN. If the gelatine prints sometimes turn out all right, and at other times they are "yellow, and of a bilious colour," it is clear that the combined bath is not in proper order. Why not use the sulphocyanide toning bath, and tone and fix separately?

REPAIRS.—M. McE. If the premises are held upon a repairing lease, the tenant will have to do the repairs, even if the damage is not done by him or his *employés*. The landlord is in no way responsible for the damage caused by mischievous or evil-disposed people from the ontside—that is the tenant's affair.

COPYING.—T. RAYNOR. The reason why you cannot get the image sharp when it is the same size as the original is that the camera does not extend sufficiently for the lens used. Either a shorter-focus lens or a longer camera is necessary. In copying same size the camera must extend to double the equivalent focus of the lens.

PHOTOGRAPHS ON CHINA.—W. WRIGHT asks: "Can you tell me the way to put photographs on china?"—The best way is the carbon process. Develop the picture on flexible support, and then transfer it to the china, which has previously been coated with gelatine containing a little chrome alum. Any manual on the carbon process will give working details.

TACKY VARNISH.—T. HANDLEY. As we do not know the composition of the varnish, we cannot say why it remains tacky instead of drying hard. Neither is it possible, without that information, to say what can be added to it to remedy the evil. The negatives, however, are not spoilt, for, if the varnish be cleaned off with spirit, they can be revarnished with another and harder varnish.

TONING.—E. F. PEALE writes: "I am glad to find I can get as good results with the separate solutions (toning and fixing), which you gave reply to a little time back. I can get better results if I place prints into toning without washing. Is there any harm in doing so?"—We certainly recommend the prints to be thoroughly washed before they are put into the toning bath, on the score of greater permanency.

TAX ON VEHICLE.—R. W. writes: "I have two places of business—towns five miles apart—and do a good deal of outdoor work. Last year I started a horse and trap to help me in the business—going from town to town, and conveying the apparatus for outdoor jobs. It has a cover, removable, on which my name is painted. This year I am taxed for it. Is that legal, as I require the horse and trap for my business?"—If the horse and trap is used exclusively for business purposes and no other, it is exempt; but, if it is occasionally used for pleasure, it is not.

CARBON PRINTING.—L. E. X. If the glass is clean, and it is well rubbed over with French chalk before the collodion is applied, there will be no difficulty in stripping the pictures off when they are *dry*. We imagine, from your letter, and as you do not care for the high gloss, that you have been trying to strip them before they are perfectly dry. If that is so, it is the cause of the failure. Let the pictures become perfectly dry before they are stripped; the high glaze can be destroyed afterwards by simply putting them in water for a few minutes, and then re-drying them.

COPYRIGHT.—WOODBURY PERMANENT PHOTOGRAPHIC PRINTING COMPANY write: "Having some recollection of a report of a case in your JOURNAL in which an operator claimed copyright in a negative made by him while in the employ of some persons who duly paid him for the same, and who was non-suited in his action, we should feel obliged if you could inform us where we could obtain a report of the case, or one of a similar sort."—We have no recollection of such a case having been taken into Court. Possibly some reader may be able to give the desired information.

PRINT CRITICISM.—ALPHA writes: "In your issue of February 7 you criticised some prints for me, so I venture to trouble you with a few more prints for criticism and advice."—In reply: 1 and 2. Fairly good studies of river scenery, that would have been improved by the addition of suitable clouds. 3. Poor in selection. 4. A very good study of children, but, in our humble opinion, vignetting for groups is best not attempted. This and No. 5 would probably have gained by being printed on a surface paper. 6. An excellent bit of interior work. 7. Spoilt by the vignetting. 8. Extremely good.

LENS, STYLE OF PORTRAIT.—FOCI puts the following queries: "1. What is the most suitable length of focus for lens to take cabinet head, such as frontispiece in ALMANAC? 2. What is the shortest lens (focus) that it is possible to use, having an eye to good results (artistic)? 3. What is the style of head known as the Richmond head?"—1. Twelve to thirteen inches. 2. This focus lens is very suitable for cabinet-size pictures, and one of shorter focus is not to be recommended if artistic pictures are desired. 3. Vignetted heads, about life size, slightly tinted, worked in the style peculiar to the late Mr. Richmond.

WATER SUPPLY.—S. W. B. says: "I am a photographer in town, and do the printing in the suburbs. The house there is a large one, and is very highly rated, and the water rate is based upon the rating of the house. As I use the water for business purposes, can I not compel the Company to supply a meter, and charge according to the quantity used?"—Yes, we believe you can; but we should advise you not to do so, for, if you did, you would probably find your water bill considerably increased, particularly if you wash the negatives and prints in running water. We strongly suspect that, if the Company knew that water was used for business purposes, they would compel you to have a meter and pay accordingly.

DEVELOPING.—J. B. WEBER says: "I have lately been using a very slow developer for snap-shots, as recommended by various papers some short time ago (a very dilute pyro developer), and the negatives are pretty good, but the gelatine is too much coloured yellow by the process. I have tried citric acid, but in vain. The negatives remain six to eight hours in the pyro solution, and under-exposed plates show more details than a rapid developer could produce. With more exposure, or rather better light, the negatives get a little too dense or opaque, which is made still worse by the yellow colour the gelatine gets in the bath. Can you suggest a remedy?"—Clear the negatives in a bath of saturated solution of alum, 20 ounces; hydrochloric acid, 1 ounce.

LINE DRAWINGS FROM PHOTOGRAPHS.—ALBERT STRAUSS says: "Some time ago (perhaps two years or more) there appeared in your JOURNAL a short description of a method by which a line drawing in Indian ink could be obtained from a photograph on ordinary drawing paper. The paper was salted and sensitised, and a print taken, which was then gone over with Indian ink, and afterwards dissolved away, leaving the line drawing only. Is it too much to ask for a repetition of the paragraph?"—We cannot trace the parsgraph. After having traced the outlines in Indian ink, the remaining parts of the photograph may be obliterated by converting them into silver bromide or chloride and dissolving out in hypo. Or the image may be simply bleached by means of mercuric chloride, which thus gives black lines on a white ground.

LENS—SHUTTER.—COLLEGE asks: "1. Will you kindly give me your advice as to a lens for a hand camera? I am unable to decide between Dallmeyer's stigmatic, working at *f*·4 focus, 5½ inches, and a Zeiss, working at *f*·6·3. I want the lens for general work, but principally landscape and street scenes. Does the lens at *f*·4 give as great a depth of focus as a lens at *f*·6·3? 2. How short an exposure is necessary to obtain street scenes that are quite sharp, showing no motion? 3. Is the Thornton-Pickard special instantaneous shutter as rapid as any shutter I can get, working in front of the lens? Would you recommend this form of shutter?"—1. A lens with an aperture of *f*·4 will not have the same "depth of focus" as one with an opening *f*·6·3. 2. About the fiftieth of a second will give a sharp picture. 3. Yes. It is a very good shutter indeed.

*** Several answers to correspondents, Editorial Table, and other communications unavoidably held over.

THE BRITISH

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EX CATHEDRÂ.

It is high time, we think, that a protest should be uttered against the class of illustrations appearing in many publications which depend on photography for the means of filling their pages with pictorial matter. It appears to be the aim of the conductors of these publications to get as near as possible to the line which separates riskiness of subject from downright indecency without actually overstepping it, and they seemingly experience no difficulty at all in obtaining negatives and half-tone blocks of subjects, the one and only effect of which can be to pander to and gratify the depraved appetites of the uncleanly and prurient-minded patrons of the cheap bookstall.

* * *

That third-rate music-hall artists, theatrical chorus girls, and vain females of that kind should freely accord photographers the "privilege" of photographing them, and pose, suggestively and scantily garbed, before the camera, with the certain knowledge that the resulting "picture" is to be circulated broadcast throughout the land, is indeed pitiful to contemplate; but we are less sorry for these coarse-minded libels on their sex than for the photographers and journalists to whom the conception and execution of such deplorable examples of modern illustrations are due. Nowadays, for a penny, the youth may obtain across the counter of a respectable bookseller's shop a number of "photographs" of vulgar actresses, vulgarly posed and vulgarly attired, which in former times would, happily, have cost much more, and, as a rule, were only obtainable in the restricted market of Holywell-street, Strand. These productions, moreover, have not even the saving feature of being artistic in arrangement or treatment; they offend against the moral and æsthetic sentiments, and rest their *raison-d'-être* solely on their close proximity to indecency. Even on the comparatively low ground of the considerations due to and demanded by public propriety, we are confident that no sensible man of the world will quarrel with our objection to the publications we are alluding to, and which it is not necessary to particularise.

* * *

We are sorry that the beautiful art of photography should be prostituted in this manner. The remorseless fidelity of the lens and dry plate confers upon such illustrations a degree of unmitigated realism which a draughtsman (and some members of this class of artists are just now, in certain papers, sailing dangerously near the wind) would tone down or avoid. That one of the papers we have in mind will ere long give publicity to a half-tone phototype which results in a prosecution, is our aspiration, for then, probably, a check will be given to the dissemination of the class of illustration we are referring to, and the reproach, that photography and photographers are responsible for the production of pictures that are only published by reason of their offensiveness and vulgarity, will no longer hold good.

* * *

The Annual Conference of the Camera Club will open on the 27th inst. Besides Captain Abney, the President, it is expected that Lord Rayleigh, Mr. Bothamley, Mr. Chapman Jones, Mr. Pringle, Dr. Eder, Mr. W. K. Burton, and Professor Norman Lockyer will take part in the proceedings. We learn from the Club *Journal* that apparatus for work with the Röntgen rays is at the disposal of members on the Club's premises. "It is also nothing but right," says the *Journal* with delicious complacency, "that the leading photographic Club in the world should show the way in matters of this kind."

The new season's *Handbook of Imperial Plates, Papers, and Films* has been sent us by the Imperial Dry Plate Company of Cricklewood. Useful information and hints with regard to the manipulation of the Company's sensitive preparations are given; and there are three articles, one by the Rev. F. C. Lambert, on "Outdoor Photography;" a second by Mr. E. J. Wall, on "Hints for the Dark Room;" and a third by Dr. Acworth, on "The Choice of Developers." We have read all three articles with great pleasure, for they are pithy and practial.

* * *

A well-known professional photographer, who was recently sojourning in Belgium, wrote us from there that he came across a photographer working a 12 × 10 snap-shot camera (very light), made by Loman, of Amsterdam. It was focussed by means of a reflector somewhat like the Vanneck, so that the picture could be seen until the instant of exposure. He was using a Goerz lens, working at *f*-16. We have been for some time expecting a development in the size of hand cameras, but we scarcely anticipated yet a while hearing that one of such comparatively mammoth dimensions as 12 × 10 would come into use.

* * *

Mr. F. K. Hurman, of 2, St. Nicholas-buildings, Newcastle-upon-Tyne, informs us that the partnership heretofore subsisting between Mr. E. W. A. Schumann and himself has been dissolved by mutual consent, as and from March 28 last. The business will in future be carried on by Mr. Hurman alone.

* * *

The Britannia Works Company send us two neatly got-up and instructive little pamphlets relating to the use of P. O. P. and the prices of their plates and films, and at the same time they make the following remarks with reference to the suggestion of a photographer, which we noted last week, concerning the provision of P. O. P. cut to four inches by five and a half inches. Our correspondent will see from the Company's letter that his wants have been anticipated: "Will you allow us to point out to a 'Practical Photographer' that we have listed and sold the size he names, with other professional sizes, for the last four years. Further, as you will see by our price-list, we pack *all* sizes, in gross boxes, for *professional use*, at popular prices. If your correspondent will write to us on a postcard, we shall be happy to give him full particulars."

* * *

A friend in New York has favoured us with some copies of the *New York Journal*, which waxes eloquent over Edison's "greatest gift to science." It is to be a gift to the scientific fraternity, we are informed, and the great genius, with marvellous magnanimity, not only declines to secure a patent for his invention, but he has given the right to manufacture it to a former *employé*. This "invention" is, of cōurse, the fluoroscope. We trust that Mr. Edison's fortunate *employé* will not have cause to set no higher value on his acquisition than that usually bestowed on most things obtained at the same rate of payment. It is a relief to turn from the indiscriminate and unearned adulation of our New York contemporary to the admirable paper by Mr. Herbert Jackson that appears in the *Chemical News*, of March 27, wherein that gentleman modestly narrates his experiments with several of some three hundred substances he has been experimenting with for two years in connexion with the examination of opaque objects through which the radiations from excited Crookes' tubes are allowed to pass. Mr. Edison is to be felicitated on his condescension in abstaining from patenting his invention.

PRISON PHOTOGRAPHY.

Some time ago we commented upon a new regulation that was made with regard to the photographing of prisoners. The regulation is now in force, and each prisoner is photographed in two positions on the same plate, one a direct profile and the other a direct full face, with the hands spread out on the front of the chest. These are the regulation positions, and the operator has no option in the matter. Why these set poses were adopted is because the powers that be at New Scotland Yard think that these views of the face afford a better means of identification than any others. Experienced portrait photographers, with some features, would, nevertheless, think otherwise.

Police photography, if one may judge from the portraits that are sometimes shown at the police stations of persons "wanted," is capable of considerable improvement. The portraits are printed from process blocks, together with the letterpress description of the culprits; but, however good the blocks may have been, they are completely ruined, as many other blocks are, in the printing and by the paper employed, which seems to be of the commonest description. Even that is made worse in some of the examples we have seen through the printing being done on the back—the web side—of the paper; indeed, some of the prints are mere blotches, and, instead of aiding the police, they are quite as likely to mislead them.

Portrait-process blocks always require careful printing on suitable paper, and there is no reason why they should not be so dealt with, except the cost. That need not, however, be greatly increased, as the portraits are but small, and they might be printed separately on good paper and mounted on the printed bill afterwards. An objection might be raised to that on account of a risk of the portrait coming off if exposed in wet weather. This can, however, be avoided by employing an insoluble cement, such as glue containing a little chrome alum or bichromate of potash, which would be rendered insoluble by exposure to light, or by a little formalin.

Stereoscopic Sciographs.—At a recent meeting of the Paris Academy of Sciences, MM. A. Imbert and H. Bertin-Sands exhibited stereoscopic photographs obtained by the Röntgen rays.

Invisible Radiations.—M. H. Becquerel continues his researches in this obscure phase of what, perhaps, may be termed light. We have, on a previous occasion, described the effects of radiations from artificial hexagonal blends that he had observed; but in his more recent communications to the Academy he has found, and M. Trovat has had a similar experience, that this body, which at first emitted most powerful rays, capable of readily passing through opaque bodies, gradually loses its power, and, after a series of excitations, gradually becomes inert and incapable of emitting any actinic radiation whatever.

Other Phosphorescent Bodies.—M. Becquerel finds that this radiation is of a peculiar nature, for the rays from phosphorescing calcium sulphide, for instance, were powerless to pass through opaque substances.

Invisible Actinic Radiations from Uranium.—M. Becquerel's most interesting work, however, is perhaps his investigations upon the emission from uranium compounds. He finds the permanence of these radiations is prodigious. Kept in the dark for fifteen days, free from any radiations of which we have any knowledge, he yet found the original emission power reduced in but the slightest degree. He considers the phenomena to be one of invisible phosphorescence, if such a term he not a misnomer. It is not all of the uranium salts that fluoresce or phosphoresce. The green uranous salts which he is working with exhibit neither phenomenon, though they act strongly upon the photographic plate through opaque obstacles. One very remarkable effect was obtained with some uranium nitrate, the phosphorescence of which disappears when the salt is heated or melted in its own water of crystallisation. Some of this he melted, and allowed to crystallise in the dark, yet, when placed over a plate covered by thick opaque paper, it acted as powerfully as crystals recently rendered active by light.

He finds the relative opacity of bodies to the rays emitted to be very different from the Röntgen rays. For example, with a thickness of two millimetres, water was very transparent, solutions of copper nitrate, gold chloride, uranium nitrate, chlorophyll solutions only moderately so, uranium glass was opaque, and aluminium sheet sparingly transparent. Tin was more opaque, and cobalt blue glass more opaque than any of the metals. Also again, unlike the Röntgen rays, he was able to obtain refraction. He placed some uranium nitrate crystals in a short tube attached near to the edge of a prism, then developed the plate (it could not be said to be the image), whereupon he found a distinct trace of a line indicating the edge of the prism, and a diffused effect in its immediate neighbourhood in the place where, if the rays had been refracted, it might be expected that the position they deviated to would be situated. Refraction was thus clearly shown.

Meteorological Predictions up to Date.—We are all familiar with the daily weather forecasts which we hunt for in the pages of our daily papers, where they appear with regular irregularity as to position; but the Americans are about to introduce something far in advance as to ready reference. We read that in a few weeks' time the stamper used at Washington for cancelling the postage stamps of letters, &c., in transit—which will, of course, be changed daily—will impress upon the stamp the weather forecast for the day, so that, instead of the irritating search in the newspaper columns, the anxious searcher after meteorological vaticination will merely have to look at his morning's correspondence to find all he requires.

New Source of Platinum.—The precarious nature of the supply of platinum was well shown a year or two ago, when a small combination was able to "bull" the price of this metal, till from a sum below 30s. an ounce it rose by leaps and bounds almost to the value of gold. It will therefore be good news to photographers that a new source of supply has been discovered of such large area that it may fairly be expected to bring down the price to a level never before reached. We read that in New South Wales a bed of platiniferous lead over a mile long has been discovered. It has been known for some time past that the metal was to be found, but it had not been properly worked. It is stated that the platinum is to be present to the large extent of 75 per cent.

Another Big Telescope.—These monster instruments appear to be part of the scientific achievements distinguishing the end of the century, and we are promised the advent of a new one under novel conditions of introduction. Hitherto, a princely benefactor has been the inspiring genius of their creation, but in this new telescope the fees of visitors are looked to, to take the place of millionaire donors. At the Berlin Exposition, which is to open next month, and continue for five months, it is proposed to exhibit in the rough one of the enormous objectives which has been successfully cast by Dr. Schott, and it is expected that enough money will be raised to enable this glass to be purchased and polished. The instrument is partly completed, but the largest objective, 110 centimetres in diameter, has to be paid for and polished. The mounting is arranged for the use of two separate objectives, the one already finished designed for precise visual work, and the other, of larger area and shorter focus, for photographic.

Forthcoming Sale of Old Masters.—The *Standard's* German correspondent says that one of the finest collections of paintings in Berlin is to be disposed of by auction at Cologne on the 28th and 29th inst. It consists of some two hundred and twenty pictures by old Italian, German, and Dutch masters, a good many of them being masterpieces. Amongst the works are Vandyke's portrait of Charles the First of England, formerly the property of the Duke of Hamilton; Rembrandt's celebrated large landscape, with *Judah and Thamar;* Paolo Veronese's *Catarina Cornaro handing the Crown of Cyprus to the Doge of Venice;* Titian's *St. Agnes*, &c. It is mentioned that hardly one of the great Dutch masters is missing in the catalogue. It will be interesting to see if any of this collection will find a home in this country. Not a few of them, we expect, if they leave Germany, will go to America, as wealthy Americans have been large purchasers of old masters during the past few years.

Colour of Negatives and Retouching.—A not unimportant point in connexion with the colour of negatives, more especially portrait negatives, was touched upon at one of the recent meetings of the Photographic Club, namely the advantage it was to the retoucher to have the negative of the same colour as that of the pencil to be employed in working it up. If the negative is stained yellow, for example, the retouching will be of a different colour from that of the image, and will have a different printing value, and in this way many retouchers, of unlimited experience, get misled in their work, the result being that the retouching shows very conspicuously in the finished print, which was not anticipated by the artist. It is a little surprising that this subject has not, before now, gained greater prominence than it has done. It just occurs to us that, if the negatives are not made the colour of the pencil, pencils can be made the different colours of negatives merely by the use of suitable pigments; but whether the pencil-makers would consider the business worth their consideration is another matter.

Variations in Pyrogallic Acid.—Mr. Cadett is reported to have made a very important statement at the Photographic Club the other evening. It was that in plate speed testing with recent samples of pyro he had found the speed of plates three times as fast as with the Hurter & Driffield standard development, and this led him to suspect that the makers of pyrogallic acid might be mixing with it one of the newer developers, such as metol, or in some other way varying it. He further said: "In any case, he noted the fact that, with some makes, or, rather, with some batches of pyrogallic acid, he got higher speed results than with others." This may possibly account for some of the discrepancies of the relative speed of the same brands of plates at various times in the hands of different workers. It also shows, as Mr. Cowan pointed out, that the committee appointed by the Royal Photographic Society was right in agreeing that the only correct method of speed determination was that one which tested the plates with the particular developer with which they were to be used. *Ergo* Messrs. Hurter & Driffield were entirely wrong in saying that all developers gave the same speed readings.

An Amusing Reply.—Last week we alluded to the amusing photographic queries and answers that often appear in an evening contemporary. In reply to the query, "What is the best and cheapest way to develop an ordinary negative?" a writer says he has used the following for years: "Washing soda (lumps), 2½ ozs.; *sulphate* of soda, 2½ ozs.; bromide of potassium, 20 grs.; hot water, 30 ozs. When cold, decant clear for use. To develop, take sufficient to cover the plate well in developing glass, and add pyrogallic

acid enough to cover a sixpence. Stir with a glass rod, and pour on the plate. Don't hurry it; it is sure to come. Let it come out till all details are well out, and add more pyro till you can hardly discern the subject in safe dark ruby light. Wash slightly, and fix in *hypophosphate* of soda, 4 ozs.; water, 10 ozs.; and clear in alum bath ½ oz. to 6 ozs., or 7 ozs. of water." The italics are ours. No size of plate is mentioned for the sixpence measure of pyro; so, presumably, it will be the right quantity for any size plate. It would be interesting to know how the learner has succeeded with the formula and instructions, also to see the negatives of the gentleman who has used it for years, especially as they are fixed with hypophosphate of soda.

HALF-TONE SCREENS BY PHOTOGRAPHY.

I.

From a theoretical point of view the reproduction of half-tone screens by photographic means, when a good original is available, is a matter of the greatest ease, involving only the ability to work with average cleanness and skill; but, when the process is put into practice, it does not, at the outset, turn out to be quite such easy work as it would seem in theory, and, in fact, to one who has had no previous experience in similar work, the first attempts will, no doubt, prove to be complete failures.

It may be asked, in view of the perfection to which modern diamond-ruled screens have been brought and their comparative cheapness, what inducement there is to resort to photographic reproductions. Of course, for all ordinary purposes and where an original screen is already available, there is no necessity for the photographic substitute, but it is only in large establishments and where unlimited capital is available that there can be any great choice of "rulings" to suit different subjects. It may be that to produce the best result a slightly coarser or finer screen may be desirable or one in which the ratio betweeen black and white is different, but to provide a complete collection of ruled screens would be a very costly matter, whereas to produce them as required by photographic means is not only possible, but costs no more than the price of the materials.

As to the means to be employed, I fancy there can be no two opinions on the subject of the preference for collodion over gelatine films. Though for ordinary process purposes it may be, to a great extent, a matter of taste whether collodion or gelatine plates are the more suitable, I think for actual screen purposes the greater transparency and freedom from colour of collodion give it an enormous advantage over gelatine. Indeed, I have never succeeded even with specially prepared gelatine films in obtaining a screen that was capable of use in the camera, whereas with collodion the clearness and transparency are equal to diamond rulings.

The choice, then, rests between wet and dry-collodion plates, and between the bath and emulsions. Although, no doubt, many old wet-plate workers will prefer to rely upon the bath and wet collodion, I think it can be shown that, for many reasons, a dry film is preferable to a wet one; but, if only for the greater cleanliness in working, and the greater ease with which a dry film free from minute defects can be prepared, the latter will recommend itself; besides which, the dry plate can be used in absolute contact with the screen if necessary. As to the choice between the bath and emulsion, that is only regulated by mechanical conditions. If an emulsion is at hand that will give a film of the needful uniformity, that is free from structure of any kind, and more particularly from mottling and similar unevenness in coating, then the emulsion film will be quite as good as one prepared in the bath; but I expect the average photographer will find it far easier to prepare a film possessing the requisite qualities by sensitising in the bath than by any form of emulsion. I do not mean to say that collodion emulsion is not suited to the purpose, but simply that, in unaccustomed hands, the bath method presents fewer difficulties.

For the purpose in question, everything depends upon the perfect evenness and uniformity of the film, and it is clearly far easier to prepare a structureless and perfectly even film of collodion than of emulsion, since the mere presence of the particles of silver bromide in the latter tend to militate against its even flowing and setting. The collodion, on the other hand, unloaded as it is, either with insoluble silver salts, or with water used in the process of mixing, flows perfectly smoothly, and sets evenly, after which the formation of the sensitive salt in a perfectly homogeneous form, presents no difficulties, assuming, of course, that the collodion in the first place is not over-salted.

If the films are to be used dry, for reasons that will be obvious to every collodion worker, the salting of the collodion will be better if it consist principally of bromide, or perhaps, for a reason I shall mention, solely of bromide. The dry films will, in the vast majority of cases, be developed by the alkaline method, for which iodide of silver has little, if any, value; but the presence of at least a small proportion of iodide in the film adds not only to the cleanness of working, but gives a colour and "body" that materially assist in preventing halation in any form. At the same time, it is quite possible to prepare a film of pure bromide that shall possess sufficient density to be quite free from danger from this source, and that will also be available for use where the "reversal" method is to be adopted, as for making a cross-line reproduction in a single operation. I do not know that the presence of a small proportion of iodide would exert any absolutely injurious effect in a film to be so employed; but, at any rate, it would not be an advantage, and, as the simple bromide film is just as easy to work, it may as well be omitted.

Assuming a simple bromised collodion to be used, the salting may consist of six grains of bromide of cadmium and two grains of bromide of ammonium to each ounce of plain collodion. The latter may be any ordinary wet-plate collodion, the only difference being in the salting. This should be kept at least a fortnight before use, but will be better after some weeks. The solvents should be of the best quality, both as regards purity and strength. The bath should not be of lower strength than forty-five grains to the ounce, and may with advantage be increased to sixty grains. Although with bromo-iodised collodion the latter would be injuriously strong, it is not so with a fairly strongly bromised collodion, which absolutely requires a stronger bath. If the collodion given above be sensitised in an ordinary thirty or thirty-five-grain bath, the film will be thin and transparent, no matter what length of immersion is given; but with a stronger bath, a three or four minutes' dipping will give a rich, creamy, and almost opaque film of great sensitiveness. The bath should be very faintly acidified with nitric acid, and, if "sunned" for a day or two before adding the acid, will be none the worse in working.

Although three or four minutes suffice to produce a rich, creamy film, it is just as well to give a little longer. Upon removal from the bath, the plate must be well drained, in order to save as much as possible of the strong silver solution, and is then transferred to a dish of distilled or boiled rain water, and thence into successive changes of ordinary water, until every trace of free silver has been removed. The perfect removal of the free silver is especially necessary if a "preservative" of tannin, pyro, or gallic acid, be used, but otherwise it is not so essential as in the days of dry plates, that had to be kept for any considerable time. It is better, however, to err on the side of care than in the other direction.

Before drying the film, it is necessary to apply some "preservative" or "organifier," that is, a solution of a gummy character, which serves the double purpose of filling the pores of the collodion film with soluble matter, that prevents its drying up into an impervious skin, and of conferring certain organic properties on the sensitive salt, that assist in giving density to the image. This preservative may consist of almost anything of a gummy or saccharine nature, and for our present purpose, as extreme sensitiveness is not a necessity, the choice is easily made. Nothing answers better than an infusion of ordinary tea or coffee, just as made for drinking purposes, only omitting the milk. A ten-grain solution of tannin, or a two-grain solution of pyro, may also be used when a "chemical" preservative is preferred, but, for general convenience, the tea or coffee will answer every purpose. W. B. Bolton.

EASTER IN EAST ANGLIA.

The toy railway from Halesworth to Southwold deposited a friend and ourselves at the station of the last named town at dusk on the evening

before Good Friday, and willing hands having taken charge of our photographic apparatus and other belongings, it was not long before we were comfortably installed in the peaceful hamlet, which is perched upon the cliffs that look out upon the German Ocean from the easternmost boundary of the county of Suffolk.

To the intense charm of its reposeful lethargy Southwold adds many other attractions for the wearied town worker. If its architectural features, with the single exception of its imposing church, reflect no lustre upon antiquity, it possesses the unique advantages of having in a marked and welcome degree escaped the advertising adornments of pill and ointment-makers, of being looked upon as beyond reclamation by the Salvation Army, of being left severely alone by the day excursionist and the excitement seeker. People go to Southwold to play golf, to indulge in the sweetness of doing nothing, to escape the irresistible distractions of less inaccessible and more pretentious watering places.

Many people also go to Southwold to take photographs, although in the large and straggling hamlet itself (for it is nothing more) the church—a fine Gothic structure, with a lofty square tower, characteristic of ecclesiastical edifices in East Suffolk—supplies the only work which awaits the camera. Southwold, however, is surrounded by wide-stretching and spacious commons, intersected by dykes and dotted by cattle, which afford every opportunity for the indulgence in pastoral photography of the kind to which Dr. P. H. Emerson accustomed us many years ago.

On Southwold beach the trained eye will discover many opportunities for picture-making by photography. Nestling under the cliff are the quaint and curious shanties of the fishermen, who, picturesque and simple-minded to a degree, and far removed from the sophisticating influences that beset their brethren on other parts of the coast, prove more docile and easily managed sitters, and provide one with plenty of scope for attempting artistic figure studies. The boatbuilder at work in his shed, the fisherman mending his nets or tarring his shanty, the inevitable group of weedy longshoremen at their eternal and almost sole recreation of gossiping and smoking, from which they seek temporary respite by ever and anon scanning the offing in their own peculiarly deliberate but mysteriously interested fashion, are ready to the photographer's hand, and almost dare him to produce negatives that do not possess at least the elements of pictorial charm or local interest.

Fishing is the one industry upon which the prosperity of Southwold appears to hinge, and the incoming of the little craft, with the subsequent examination and basketing of each sea toiler's small harvest at the boat's side, yields the photographer excellent chances of attempting studies full of natural variety. The man with the camera, however, has to be quick of perception, and no less expeditious in action, for these interesting incidents of the shore are of comparatively brief duration, and your Southwold fisherman, so soon as he has analysed his catch, evinces a laudable anxiety to set about disposing of it. Still, the men are a simple, kindly, albeit independent and self-respecting race, and a morning or two spent in their midst is certain not merely to be repaid by a crop of good studies for the camera, but to give additional pleasure to the companionable visitor who may delight in listening to the local dialect, and to interest himself in the ways and manners, the joys and grievances, and the legendary lore of the Southwold fishermen.

Northward of Southwold, and across a breezy stretch of common land, from which it is separated by a calm and sluggish river, the Blythe, lies the well-known village of Walberswick, which, with its red-roofed cottages, its flats and shallows, its charm of colour and picturesque grouping, is beloved of artists and photographers alike. For those who take delight in the more placid and not obvious photographicable beauty to be found in subjects relying for their success upon the introduction of marshy excerpts, reeds and ruts, misty effects, and clouds rising up from the quiet distance, into which the silent river steals away from this old-world little village, the vicinity of Walberswick is the ideal spot in which to idle away a day or two in company with a camera and a few dozen plates. It is essentially a place where one is called upon to make one's pictures, and hence it may be said to appeal rather to the photographer with some approach to cultivated perception in the selection of subjects than to the very numerous class which demands its picturesqueness ready-made, and, as it were, plainly labelled, "To be exposed upon."

During our stay at Southwold, we encountered several photographers whose names are household words in the world which interests itself in pictorial work, and we have little doubt that we shall make acquaintance with some of the results of their labours at the autumn exhibitions. Both for health-giving restfulness, as well as for the fine field it supplies for the practice of what may be termed the higher branches of pictorial photography, we can cordially recommend Southwold as an excellent centre of a district rich in the unconventional charm of ungroomed natural beauty and picturesqueness.

We availed ourselves more than once of facilities for changing plates kindly afforded us by Mr. J. Martyn, of Southwold, a professional photographer whose excellent portrait and landscape work, as well as the neatness, orderliness, and the apparent excellent adaptation of his studio for the production of good work, might excite envy in the breasts of photographers in much bigger towns.

DISCURSIVE NOTES ON CARBON PRINTING WITHOUT TRANSFER.

[Autotype Notes.]

During the past year or two a good deal has appeared in the photographic press on the subject of carbon printing without transfer, not a little of it being from the pen of Mr. Alfred Maskell, who should be credited with being a doughty champion of the non-transfer system of working. In his communications he has, on several occasions, had a mild fling at the *Autotype Manual*. In an article in the *Amateur Photographer* for the 6th ult., these ideas are reiterated. Alluding to the early workers, its writer says: "The contention that in the carbon process half-tone can only be obtained by the process of detaching the film from the unexposed surface is a notion much fostered in this country by the various issues of the *Autotype Manual* or virtual copies of that manual." The writer then gives Mr. Maskell's method of preparing the paper. This is precisely the same as that published by the late Mr. John Pouncy nearly forty years ago; and, in a recent number of The British Journal of Photography, Mr. Pouncy's son calls attention to the fact, and pertinently asks who is the author of that method?

As I know some experimentalists have failed to obtain an even coating by Mr. Maskell's way of applying it, I will give Mr. Pouncy's method as originally published by him, as it may prove useful to modern investigations. Three solutions are prepared: 1. A saturated solution of bichromate of potash. 2. A solution of gum arabic about the consistence of thin varnish. 3. Vegetable carbon finely ground in water. Mix four drachms each of Nos. 1 and 2 together, and add some No. 3. The paper being laid on a glass plate, "commence coating freely with a broad camel's-hair brush, laying on a copious supply over the whole surface, and then allow the paper to absorb for about two minutes. This done, remove the superfluous liquid thus: Take a painter's 4-inch hog's-hair 'softener,' and work it regularly over the paper, with an alternate vertical and horizontal motion, until the whole presents a smooth, even surface, partially dry. The drying may then be completed by the fire."

That good results can be, and have been, produced in carbon without transfer cannot be denied. Pouncy did show some exceedingly satisfactory prints by his method. I well remember that, at the meeting of Photographic Society in 1858 (and a stormy one it was too), when Pouncy brought his process before it, one of the, then, old workers in photography, and an opponent of the process, had to ask Mr. Pouncy which of two prints from the same negative was carbon and which was silver; and, when told, he remarked that the carbon was a very beautiful result. I just allude to this fact because it has been mentioned more than once lately that it is only within the last year or two that good carbon prints, without transfer, were a possibility.

When the carbon process was first introduced I well recollect that Mr. Pouncy had rather a rough time of it, for it was a pretty general thing at that period for the journals to "take sides." If one extolled a process, it was almost certain to be decried by the others, and so it was with Pouncy's process. *Photographic Notes* championed it, and *The Photographic News* lost no opportunity of disparaging it, and its inventor, both in editorial articles and in anonymous communications, particularly when it was suggested that the process should be disposed of to a certain number of subscribers for the sum of 100*l.*, not a very large amount after all. One of the arguments raised against the process, I remember, was that the pigment could not be got into a sufficiently fine state of division to properly render the delicate tints of a photograph. Another was—and that was a more legitimate one—that it would be impossible to obtain the same delicate half-tones as with silver. This was substantiated in practice unless negatives of an exceptional character were used, and they were not the kind in general vogue then.

There is no question, if Burnett, Blair, and others had not pointed out that, in order to obtain perfect half-tones, the exposure must be made from one side, and the unaltered pigmented coating washed away from the other, that "notion much fostered in the *Autotype Manual*," carbon

printing would never have assumed the proportions it has. When Swan's process was introduced, that of Pouncy was little heard of afterwards. There is, however, very little doubt that, if the transfer operations could be dispensed with, and equally as good results obtained as with them, the carbon would be the most generally practised of all the printing methods.

It is claimed for a process which has been considerably extolled during the last year or two, by some, that it fulfils the above end; I allude to the "Artigue process." That process, however, must not be confounded with that of Pouncy, as described by Mr. Maskell. It is quite a different thing. The paper is differently prepared, and is manipulated in a totally different way. By this method, and with suitable negatives, tolerably good results can be obtained, provided the exposure has been accurately timed. But are the results equal to those obtainable by the ordinary carbon process? Are the tones throughout the scale from the highest lights to the deepest shadows so perfect in gradation as they are by the ordinary process? I must say that, in all the examples I have closely examined, they were not, good though they were. If the scale were true, say, from the shadows to the middle tones, that from the middle tones to the high lights was not. On the other hand, if those from the highest lights to the middle tints were in perfect gradation, then the deeper tints were not. The ordinary carbon process would have rendered them more correctly. Possibly, however, I have been unfortunate in the various examples I have met with.

E. W. Foxlee.

VIEW-FINDERS WITH PRISMS OR SPHERICAL REFLECTORS.

Mr. G. F. Fraas describes the following plans of obtaining a bright image without the aid of a screen of ground glass or other material:—

1. By the combination of a lens or lenses with a prism in a suitable mount or setting.

2. By the combination of a lens or lenses with a spherical reflector in a suitable mount or setting.

On looking into the prism, or spherical reflector, at right angles to the axis of the lens directed towards any object, a distinct image may be clearly seen.

A prism only may be used, with or without any mount or setting. I do not bind myself to any particular form of prism, as the sides may be all plane or curved, or combinations of planes and convex or concave curves. The hypothenuse of the prism may be silvered or not, as preferred.

The curved surface of the prism is to magnify the image, and to collect the rays transmitted by the front lens, where one is used.

The most portable and convenient method of setting is a light metal box, but any other material can be used.

The lenses may be biconvex, or plano-convex, or "crossed" convex, as preferred.

The patentee claims:—1. A view-finder having a prism, or prism and lens, substantially as described. 2. In a view-finder for photographic purposes, having a combination of prism and lens or lenses. 3. In a view-finder the combination of a lens or lenses and spherical reflector.

A "SILVER CHROMATE PRINTING PROCESS."

This process is the invention of Herr Hrdliczka- Csiszar, of Vienna, who gives the following description of its *rationale*, and the method of preparing the emulsion:—

The known silver salt paper—for instance the so-called albumen paper, celloidin paper, the various known gelatine or Aristo papers, as also arrowroot and algeine paper and plates—when used for printing or reproducing negatives gives a print whose degree of brilliancy differs according to the kind of paper used; the so-called Aristo paper gives the most brilliant print, but "thin" and "flawy" negatives prepared with such paper yield in every instance but flawy and dull prints, *i.e.*, prints lacking contrast.

According to the present invention, certain substances are incorporated with a silver-salt preparation, and, by means of the resulting compound, good bright prints with high lights may be obtained even from the dullest negatives which cannot be reproduced by the processes at present resorted to. This is effected by adding ferrio-prussiate or monochromic, dichromic, or polychromic salts or chromic acid, or manganates or permanganates to the known preparation; for producing silver-salt paper, a chromate or dichromate of silver is thereby formed, either during the sensitising of the paper or during the preparation of the emulsion.

The printing, toning, and fixing of a ribbon prepared from such paper showed, on being tested in Professor Vogel's photometer, that it printed very rapidly, which in practice signifies that very thin, flawy, and dull negatives yield brilliant prints on such paper.

I shall now describe, by way of example, the employment of the above mentioned chemicals in combination with a celloidin or Aristo emulsion, although, for a person skilled in the art, no further explanation is necessary, seeing that the print is rendered brilliant by adding any one of the substances above mentioned, while the determining of the amount of such substances to be added for producing various degrees of brilliancy, as also the employment of the proper paper or plate prepared according to this invention for a certain flawy negative, is a matter which experience alone can show. First, the known solution of 1·3 grammes of lithium chloride, 1 gramme citric acid, and 50 cubic centimetres alcohol is prepared by heating 4 cubic centimetres of a 4 per cent. solution of celloidin-collodions being then added; 12 grammes of silver salt are now dissolved in 5 cubic centimetres of hot water, 150 cubic centimetres anhydrous alcohol added and then heated to boiling point; the resulting solution of silver nitrate is now gradually poured into the chlorous collodion mixture. The known emulsion of chloride of silver collodion is thus obtained.

According to this invention, however, about 1 gramme ammonium chromate, or bichromate, is dissolved in 10 cubic centimetres of water and mixed with as much alcohol as the solution admits without being made turbid; the other chromates, or compounds of ferric-cyanates may be prepared in like manner. This solution is now allowed to drip into the known emulsion (which is at the same time vigorously agitated) until tests show that positives of the desired brilliancy may be obtained from the thin and flawy negatives to be printed. By following this procedure, it is possible to obtain a series of silver paper or plates of different printing properties.

Aristo paper, which does not print very readily, may also be produced in the same manner. The employment of said salts in connexion with the various salted papers, such as albumen, arrowroot, resin paper and the like, is not so difficult, it being only necessary to add a few drops of the solution of above-mentioned salts to the emulsion preparation, the reaction with the silver nitrate not being effected until the paper is sensitised in the silver bath.

Although it is taken for granted that the silver-salt preparation is known, it may be well to give one of the compositions of 4 per cent. celloidin collodions, *viz.*:—

A { 100 grammes Schering's celloidin dissolved in
2 litres of alcohol of 96 per cent.,
2 litres ether of 0·725 specific gravity; to this is added

B { 100 grammes silver nitrate dissolved by heat in
60 cubic centimetres water and
350 cubic centimetres alcohol (96 per cent.) added.

B is brought to such a temperature that an elimination of silver crystals is no longer perceptible; the following is then added:—

C { 25 grammes citric acid, dissolved in
250 cubic centimetres alcohol (96 per cent.) and then a solution of

D { 12 grammes chloride of strontium,
12 grammes chloride of lithium, dissolved in
250 cubic centimetres alcohol 96 per cent..

Finally, 20 grammes of castor oil and 30 cubic centimetres of glycerine are added.

The above emulsion may be successfully employed, although it will be evident that it may be varied in numerous ways according to the different properties required of same, *i.e.*, according to the particular purpose for which it is destined. As already stated, the success of the present process is by no means dependent on the particular composition of the above emulsion; the emulsion as ordinarily prepared is rendered capable of yielding brilliant prints by adding the attenuating and retarding substances.

An emulsion yielding well-defined and strongly contrasting prints may be easily produced by adding the following substances to a known emulsion, prepared, for instance, in the manner above mentioned. A solution of the additional substances is prepared in the proportion of 1: 10 of the known emulsion and then added drop by drop in the latter until a more or less strong colour is imparted to same; the resulting emulsion is rendered more and more effective by dropping a correspondingly greater quantity of the solution into same. In practice, the additional solution added to the known emulsion is limited by dropping about 8 cubic centimetres of the 10 per cent. solution of chromic acid or dichromate to each litre of the known emulsion and constantly agitating same all the time.

While the afore-mentioned known emulsion registers 15° in Vogel's photometer, on adding 2 cubic centimetres of the chromic solution it registers 10°, on adding 4 cubic centimetres 8°, and 8 cubic centimetres 6°; hence a most effective emulsion is obtained. The same effect may be obtained with ferric-cyanates, manganates, and the like, whether the emulsion is used on paper, glass, porcelain, wood, leather, silk, or like substances.

The following is a good Aristo gelatine emulsion: 100 grammes of gelatine is put for half an hour into 500 cubic centimetres of water and then heat applied until the gelatine dissolves. To this solution is added

20 grammes citric acid dissolved in
100 cubic centimetres of water and
2 grammes seignette salt dissolved in
10 cubic centimetres water; and finally
50 cubic centimetres of a 10 per cent. solution of chloride of ammonium.

The whole is now heated to 40° Centigrade, and a silver solution com-

posed of 30 grammes silver nitrate and 500 cubic centimetres of water at 30° Centigrade added drop by drop to same, the emulsion being thoroughly stirred all the time.

The above gives the ordinary Aristo emulsion, which, on adding more or less of the additional substances, as before described, may be brought to the desired state of perfection. The inventor claims:—

1. The herein-described process of making a silver-salt preparation for photographic purposes, consisting in adding to a known silver-salt preparation substances such as ferric-cyanates or chromates, which attenuate or retard the effect of the resulting emulsion.

2. As new articles of manufacture, silver-salt preparations or paper for photographic purposes prepared from an emulsion made by adding ferric-cyanates, chromates or the like to a known silver-salt preparation.

ON A NEW METHOD OF PREPARING PLATES SENSITIVE TO THE ULTRA-VIOLET RAYS.*

V.—The Development.

The development is carried out solely and alone with pyro and soda prepared according to Dr. Eder's formula (vide *Photographie mit Bromsilber-gelatine und Chlorsilber-gelatine*, 4th Edition, 1890, p. 294)—

I.

Crystallised soda sulphite	100 grammes.
Pyrogallic acid	14 ,,
Sulphuric acid (to neutralise the alkaline sulphite)	6 drops.
Water distilled	500 c. c.

The sulphite is dissolved in the water, the acid added, and finally the pyro.

II.

Crystallised soda carbonate	50 grammes.
Water distilled	500 c. c.

If anhydrous carbonate be used, only half the above will be required.

The developer should only be used greatly diluted, otherwise spots and fog appear on the plates. I use for each volume of pyro and soda solution 3 to 6 volumes of ordinary water and some potassium bromide. The image appears in about twenty to thirty seconds, and is finished in two to three minutes. If the development is carried on longer, fog comes on, notwithstanding the dilution of the developer, and sometimes even earlier. If the image is to show clear glass, then the plate must be washed as soon as the fogging begins, and fixed immediately afterwards. In my experiments the fogging frequently began after the development had gone on for 90 to 100 seconds. If the negative does not come up completely in this time, another plate must be taken with longer exposure. It is no use trying to attain the object by forced development.

It is only by observing this precaution that a clear picture can be obtained with these plates sensitive to the ultra-violet.

For spectrum photographs, which particularly require delicate delineation, especially for bringing out closely packed lines, I have lately followed another method of developing. I take no heed of what appears on the plate—it would, in fact, soon be impossible, because the lines could not be seen in the development on account of their exceeding fineness; so I leave the plate in the developer for a certain time, which I have ascertained by experience. It is true I do not succeed with a single trial. As a rule, the first negative I take in this way does not do, because the lines are too broad, and lines lying together are either massed together or insufficiently separated. In such case I take the negative again. Although I keep to the original exposure, I shorten the development by some seconds. In this way I obtain frequently, but only after the third or fourth exposure, line pictures of a fineness which I cannot obtain with ordinary development. This way of working takes up a good deal of time, but the beauty of the resulting negatives richly repays the great expenditure of time and trouble.

The fogging of the plate can be restrained with potassium bromide, but care is necessary with it. Potassium bromide exerts a decided influence on the size of the silver particles which form the negative or the so-called "grain" of the plate. I take 5 to 10 drops of ten per cent. solution of potassium bromide for 60 to 180 c. c. water, 20 c. c. pyrogallic acid and 20 c. c. soda solution.

With gelatine emulsions, it is assumed that the grain of the emulsion is the same size as the grain of the image. If this is not strictly the case with such plates, as is shown by the microscope, it is still less so with plates sensitive to the ultra-violet rays.

* Continued from page 235.

The negative grain of a plate sensitive to the ultra-violet is in most cases a combination of several, often even of a great many, grains of emulsion, which together form a blackish-brown cluster of varying form and size. The size of this cluster depends on the nature of the sensitive coating and on the composition of the developer. It will be increased by silver iodide, but still more by potassium bromide in the developer. In general, silver bromo-iodide in a developer containing potassium bromide gives a coarser negative grain, while silver bromide in a developer free from bromide gives a finer one.

How much the size of the grain sometimes depends on the potassium bromide is shown by the following uncommon case. I cut a bromo-iodide plate into three parts, and, without exposing to light before doing so, developed the first part without bromide, the second with a small addition of potassium bromide, the last with five times as much, and each until a strong fog appeared. The three plates show on a transparent ground a series of negative grains in turn 0·02 mm., 0·14 mm., and 0·27 mm. in size, besides, it is true, many smaller grains also. All these grains have the form of a disc, and the distance between them increases with their diameter. These plates, especially the coarse-grained ones, quite produce the impression that the silver bromide, which at first covered the ground of the plate, had been used up in forming the larger clusters. Whether, and to what extent, the solubility of the silver bromide in potassium bromide is connected with the enlargement of the grain, I must leave undecided, because I have not occupied myself further with this question.

The gelatine appears to have some influence on the formation of the usually angular or round-shaped negative grain. Silver bromide containing agar-agar gave me coarse, moss-shaped forms.

The size of the negative grain of a bromo-iodide plate developed with a developer containing potassium bromide depends further on the nature of the cause which brings about the decomposition of the developable silver haloid. An unexposed plate developed to the point of fogging, gives the coarsest grain, and an exposed plate the finest; between them lies the grain which is given by a moderately exposed sensitive film.

If the washing of the plate after the first drying is omitted, then it always carries with it a small quantity of potassium bromide after leaving the silver solution, and also certainly some potassium nitrate besides. In this case the appearances are more or less similar to those which follow the addition of potassium bromide. I have not studied the effect of potassium nitrate on development. There is no fear of free potassium iodide in the sensitive film, because, during the precipitation of the silver haloide, it will be completely changed into silver iodide and potassium nitrate before the bromide can separate itself out.

If potassium iodide is added to the developer, then the image appears very quickly, seldom, however, without fog. If the development is not stopped at the right time, the fog increases until the image disappears from sight, notwithstanding that it is still easily visible by transmitted light on account of its unusual density. In most cases the fog begins at the edges of the plate, so that the middle of the plate is also more transparent after fixing.

The quickness with which the image appears and its great intensity, in consequence of which more details are visible in the developer than on a less intense plate, led me at first to the belief that potassium iodide would allow of a notable decrease of exposure; but comparative trials showed that the gain is small. The increase of density is of greater importance. Only the lines developed with potassium iodide have such fuzzy edges that they are badly adapted for sharp measurements. Their grain is enlarged, and, partly on account of the foggy ground, not sharply defined. In other cases, plates which are wanting in intensity and too transparent under the microscope to permit of being distinctly focussed, answer the purpose better if developed with potassium iodide than is otherwise possible.

The addition of iodide to the developer should only be very small, otherwise the plates may become covered in a few seconds with such a thick fog that only the high lights of the image remain perceptible. I use a solution of one per cent., and for each 3 c. c. of pyro solution one to two drops of it.

Potassium bromide checks the foggy tendency of the iodide, but only slightly. With six drops of bromide solution (1 : 20) to 3 c. c. pyro solution, the fogging caused by one drop of potassium iodide (1 : 100) could only barely be checked.

Potassium chloride lessens the fog, but also the sensitiveness and intensity. The disadvantages, unfortunately, outweigh the advantages. It is so at least with silver bromide, with which alone in this case I have any experience (one trial).

A developer containing gelatine tends to a fine-grained image and also

checks the formation of fog. Towards the end of the development potassium bromide may be added without fear of enlarging the grain. If the bromide be present from the commencement, the image acquires great clearness, but comes up slowly. If the plate contains silver iodide, then the grain enlarges under the influence of the bromide. My developer contained 2 c. c. of solution of gelatine (1.50) to 3 c. c. of pyro (one trial).

Ammonia employed as a preliminary bath heightens the sensitiveness and intensity of the silver bromide. The lines will be clearer, the ground of the plate lighter, although it shows larger spots than an unbathed plate does. This mode of sensitising does not answer in practice because the bathing (15 minutes in 150 c. c. water and 1 c. c. ammonia) and the subsequent drying take up too much time (one trial).

The general result of my experiments in developing can be summed up—in using a largely diluted developer and little bromide, with a good exposure, but, above all, short development. VICTOR SCHUMANN.

(*To be continued.*)

PLATINOTYPE PRINTING.

[Dundee and East of Scotland Photographic Association.]

PLATINUM printing is certainly very popular with those who practise this process, and why beginners do not use it more is, I fear, due to the fact that the name at first sight carries with it some suggestion of expense in connexion with special apparatus, such as calcium tubes, rubber pads, hot baths, thermometers and stoves, gas or otherwise.

Those who have up to the present held aloof from the process on this score may at once put these scruples aside, for I assure them that no expense need be incurred in procuring any of the above-named articles, as they are not required in the "cold-bath" process about which I am speaking with you this evening.

There are three things that we look for in any printing process, viz., (1) simplicity of manipulation; (2) beauty and variety of results; and (3) permanence.

Under the heading of simplicity, I may safely say that no process can compete with this one. The image not being altogether a latent one, no actinometer need be used, and there is no single or double-transfer process that the amateur need fear. Nothing could well be more simple than the process of printing, developing, and clearing; there is no toning.

I may here mention that, with a suitable negative, it is possible to print by daylight, develop, and mount a print complete in half an hour. If printing is conducted by artificial light, this time can be reduced considerably, so that I think it will readily be admitted that a process which can be worked so rapidly cannot be other than a simple one.

Under the second heading of beauty and variety of results, I must say that, in using the cold-bath process, we are more or less restricted to black tones. The effects that can be produced, however, with these tones will compare with any other black-and-white process, and, although it may be equalled by the carbon process, it certainly is not excelled by it. Platinum does not enjoy the advantages attendant with the carbon process of almost unlimited choice of tones to suit all the artistic, fashionable, and other outrageous demands made by those workers who wish to establish a school of their own, and hand their names down to posterity as the benefactors of the dealers in photographic apparatus.

Of all the printing processes which we possess, platinum and carbon stand out pre-eminently for their permanency, although I cannot help thinking that the permanence of any process is very much dependent on the substance that the emulsion or salt is coated on. The process itself may be divided into three stages, viz., printing, developing, and fixing or clearing.

I am confining my remarks to platinum paper manufactured by the Platinotype Company, of 22, Bloomsbury-street, London, although there are several other good makers. The papers are of several grades or kinds, viz., H.H. and C.C. are manufactured for the cold-bath process, and refer to the surface, texture, and thickness of the paper. As the paper has a great affinity for moisture, every precaution should be taken to keep it perfectly dry. The paper is put up by the manufacturers in tins which are sealed up, and the contents kept air-tight, and in this condition will keep for an indefinite period. A small supply of calcium chloride is enclosed with the paper. This is done in order that any moisture that may have been in the paper itself, or the tin, at the time of packing, may be absorbed. The calcium chloride having a great affinity for moisture, the contents of the tin are thus protected. As these tins do not lend themselves readily for the purpose of keeping the paper in after once being opened, owing to the fact that it is rather difficult to render them air-tight again, it is advisable to transfer the paper to another receptacle known as a calcium box or tube. This is a box or tube which has a space for keeping a supply of calcium chloride in, in addition to the paper. Specially made receptacles may be bought of the dealers, but they are an unnecessary luxury, as any one can, in a few minutes, make one answering every purpose for a few pence by procuring two tins such as are used for putting up cocoa in, one a little larger than the other. In the inner place the paper, and in the outer space put a small quantity of the calcium; put on the lid of the larger box with a piece of waxed paper underneath, and a tube answering all practical purposes is the result. I may here make a few remarks from my own experience regarding the keeping qualities of the paper.

The paper will keep a considerable time in the maker's tins, previous to being opened, and little, if any, difficulty is experienced in keeping the paper in the calcium tin if the tin itself is stored in a dry atmosphere. The ordinary calcium tin is, however, useless for the purpose if kept in a damp atmosphere, even if the calcium be dried once a week. Indeed, if the paper has to be kept in a damp atmosphere, I prefer to keep it in a tin without any calcium at all, but sealing up the tin as securely as possible, for, if moisture *can* find its way into the tin, the presence of the calcium is only an inducement for it to do so; so that it cannot be too strongly urged upon users to keep the tins in a dry place, and not trust too much to the calcium to protect the paper from moisture. If one is continually using the process through the season, there is no reason why the paper should remain for a long enough period in the tin to deteriorate; but it is advisable to put the tin containing the calcium near the fire occasionally (having previously removed the paper), in order to keep everything as dry as possible. If these points be attended to, there will, I am sure, be no difficulty in keeping the paper in good condition. If, however, it is required to keep the paper for a long period through the winter months, the best method is to wrap the paper up in waxed paper (such as some makers use to wrap dry plates in) and place the whole in the calcium tube, which has been previously dried; the joint around the tin should be sealed up securely with wax, and the whole put away in a cool, dry place. The effect on the finished print is very marked when the paper has been subjected to moisture (as you will see from the sample prints which I have passed round), the image having a flat, muddy, sunk-in appearance.

One of the first things which demands consideration is the sort of negative required to yield the best results. This is very much a matter of opinion, but it may be taken for granted that any good negative having a normal exposure, with clear gradations from high lights to shadows, with harmonious half-tones, will give a good print. I myself always develop to get a thin plucky negative, which generally yields a good print if over-exposure has been avoided. Very thin negatives do not give good results on the H.H. paper, but the new C.C. paper is said to be specially suited for such negatives.

Having got a suitable negative, the next step is to prepare the printing frame for its reception. It is well to be on the safe side, and thoroughly dry both frame and back with the padding (especially the latter) before a fire. The negative is placed in the frame in the usual way with the paper in contact, and, in order that the paper may be protected from moisture whilst in the frame, it is usual to keep in contact with the back of the paper some waterproof material, generally vulcanised indiarubber. There is, however, no necessity to go to the expense of procuring this, as a sheet of oiled paper, such as is used in offices for the copying of letters, is, in my opinion, far more efficient for the purpose, besides being much cheaper. Several thicknesses of paper are put behind this, and the back put on and secured in the usual way.

As the paper is much more sensitive to light than the ordinary P.O.P., this operation should be conducted in subdued light, as the effect of short exposures to light does not appear until after development.

The paper before exposure to light, as you will see, is of a pale lemon-yellow colour. As printing proceeds, the shadows begin to appear, gradually gaining in strength and depth. First showing a tint of bluish or greenish-grey, printing will proceed until these dark portions are a decided blue-grey, and, if the negative is a very plucky one, with a wide range of contrasts, it may be necessary to carry the printing on until the shadows are of a slight orange-brown. By this time the other portions of the print will have advanced, according to the quality and gradation of the negative, the high lights being just visible. If the shadows become bronzed before the high lights are visible, it may safely be taken that the negative is too harsh, and, if not under-exposed, should be reduced.

It will be seen from this description that the process is not, strictly speaking, a print-out one—that is to say, the image does not print out to completion in the frame.

Printing takes about two-thirds the time P.O.P. would have taken to give a print ready for the toning bath. If printing be carried beyond this stage, no apparent change takes place, as no over-printing is seen until the print is developed. For this reason printing is the only vital point throughout the process, and it is only by practice that the beginner will acquire the small amount of skill necessary to judge when printing should be stopped. This is, however, not a difficult matter, for, after a few trials, the necessary skill will be acquired.

Several types of actinometers have been invented to aid the beginner, but they are really of very little service unless several prints are required off one negative, when they are of use, inasmuch as they help to ensure that all the prints shall be printed to the same depth. It is advisable to develop the prints as soon as possible after being removed from the printing frame, although, if care is taken to preserve the prints in a dry condition, they may be kept for a few days before being developed. This, in my opinion, has a deleterious effect on the finished print, which seems to lack the fresh brilliancy of the print that has been developed soon after printing. As the developing process is such a simple and brief

operation, there is no reason why the prints should be kept any length of time after printing.

The developer consists of a solution of neutral oxalate of potash, and is best made up as a stock solution of—

Oxalate of potash	16 ounces.
Water	54 „

For use make up in a separate bottle a solution of one part stock solution and two parts water. This used solution should be kept separate from the stock solution, and, in consequence of its dilution, will deteriorate after a certain number of prints have been developed. When defective development is observed, it should be thrown away, and a new one made up from the stock.

If the bath is slightly alkaline, it gives warmer tones than when acid, in which case the tones are colder. The bath should not be too alkaline, but just sufficient to blue-red litmus paper. Carbonate of soda or potash should be used for this purpose, and, if the bath is required acid, oxalic acid should be added. I may mention that the developer which I am using to-night is almost neutral.

The prints are developed by first floating face downward on the developer, when they may be turned up so that progress of development may be observed, which should be stopped as soon as the desired result is obtained by passing the print into an acid clearing bath made up of—

Pure hydrochloric acid	1 part.
Water	60 parts.

The pure acid should be used, and not the commercial. The prints should remain face downward in this bath for five minutes, after which they should be put into a second bath for about ten minutes, and finally into a third bath for about fifteen minutes. The above is the time recommended by the makers as necessary for the clearing of the prints, but I have never left them in longer than ten or fifteen minutes altogether, and I have never found the prints suffer any ill by curtailing the time. The last bath should be quite colourless when the prints are removed.

The prints should be washed in running water for half an hour or three-quarters, after which they may be dried between blotting-paper, or allowed to dry in the open.

The Company prepare a special developing salt known as the D salt. A stock solution is made up of—

D salt	½ pound.
Water	50 ounces.
For use of stock solution	1 part.
Water	1 „

They claim that this developer gives colder tones than the oxalate developer, and also more half-tone.

For intense black tones use—

Stock solution	2 parts.
Water	1 part.

Development usually takes about thirty seconds or more. The developer is used cold, that is, to say, at a temperature of from 60° to 100° Fahr. If the developer is used colder, it tends to give coarse granular prints, and, if it is too hot, it tends to give brown, muddy tones when correct exposure has been given, although under-exposed prints may often be saved by heating the bath.

The question may be asked as to the relative costs of printing on P.O.P. and on platinum.

Taking P.O.P. quarter-plate size, we have thirty-six sheets, 1*s.*; 3 gr. gold chloride at 2*s.* for 15 gr., say 5*d.*; sulphocyanide, 45 gr., ½*d.*; hypo, ½*d.* Total cost, 1*s.* 6*d.* for thirty-six prints, or ·5*d.* per print. Against this we have for the platinotype process twenty-four sheets, 1*s.* 6*d.*; oxalate bath, ½*d.*; acid bath, ½*d.* Total cost 1*s.* 7*d.* for twenty-four prints = ·79*d.* per print. Therefore platinum is fifty-eight per cent. dearer than P.O.P., or, in other words, 100 platinum prints cost as much as 158 prints on P.O.P.

These figures may appear at first sight rather appalling to the thrifty mind, but then we have not taken into our calculation the expensive language used, and that still more expensive item in all photographic operations, viz., failures! The very words silver and gold spell failure and stumbling-block for the beginner, and I do not suppose that among our oldest workers there is one who will be bold enough to say that he has overcome all the defects of the silver process, and can always rely on the results as permanent and lasting. The platinotype process is simplicity itself, and the results are certain and permanent.

I think that if two beginners were set to work at the beginning of the season, one working silver and the other platinum, it would be found at the end of the season that the cost per print (after throwing away failures) would be as much, if not more, for the silver print than for the platinum print, and perhaps the worker in platinum might have a medal in his possession, whereas the worker in silver would probably have earned a certificate (for West Green).

I know of no better method of comparing the costs of the two processes than the above.

Local Development.—The developing process which I have just demonstrated is the simplest for the beginner, but greater latitude is put into the hands of the more advanced worker by the "Brush method" of development, either the oxalate developer or the Company's special developer may be applied by brush. The prints themselves will bear a considerable amount of brushing without injury. Developing is, however, much easier if the developer is mixed with glycerine; the surface of the paper is better preserved, and the image penetrates less.

A stock solution is made up of—

Oxalate of potash, 1 ounce	1 part.
Water, 3 ounces 3 drachms	„
Glycerine, pure	„

For use, mix 1 part of stock solution with an equal volume of water.

The salts with which the paper is coated are almost insoluble in pure glycerine, and the addition of glycerine to the developer slows its action. This property places considerable power into the hands of the worker, as an over-printed portion of the print, such as the sky, may be retarded by the proper application of glycerine and developer, until the other portions of the image have gained full strength. W. H. Tittensor.

EXHIBITION OF THE BELGIAN PHOTOGRAPHIC ASSOCIATION.

The Musée Moderne at Brussels, which is the scene of the second Exhibition organized by the Association Belge de Photographie, just opened, is a most suitable building for the display of all kinds of pictures. It has evidently been built strictly for this purpose, and therefore, in the way of lighting and convenience of hanging, is all that can be desired.

The Salon principle here obtains, viz., a selection committee and no entry fees or awards, but at Brussels each accepted exhibitor receives the medal of the Society as commemorative of that acceptance and the occasion. From details supplied by the Secretary (M. Vanderkindere), it appears that some 2300 pictures were sent in by 225 exhibitors, the work of the jury reducing these to 500 frames by 182 exhibitors. These were divided up as follows:—

Great Britain.—Mr. & Mrs. Anckorn (Arbroath), Ernest R. Ashton (Tunbridge Wells), Harold Baker (Birmingham), E. Evelyn Barrow (London), Chas. S. Baynton (Birmingham), Harold E. Brightman (Bristol), John Carpenter (London), C. Casstine (Swanley), Chaffin & Sons (Taunton), S. Chapman (Swansea), H. J. Claque (Sheffield), Chas. E. Cowper (Sunderland), W. Dawes (Plumstead), Fred. Dean (Burgess Hill), Donald Dove (Glasgow), A. R. Dresser (Bexley), Thos. E. Ellis (Woolwich), Henry Everett (London), John H. Gear (London), H. J. Godbold (Hastings), Miss L. Halliday (London), Arthur Hands (Leytonstone), Geo. L. Hankins (London), Martin J. Harding (Shrewsbury), G. J. Harris (London), W. M. Harrison (Falmouth), Miss L. Harvey (Liverpool), Hedges & Sons (Lytham), E. Cecil Hertslet (London), Alf. J. Jeffreys (Chelmsford), Chas. Job (Lindfield), Johnson Bros. (Henley), J. F. Lloyd (Liverpool), Reg. B. Lodge (Enfield), E. Lumsden Brown (Edinburgh), Fred. Marsh (Henley), Sam. G. Mason (Birmingham), W. Mawer (London), Wm. Norrie (Fraserburgh), Chas. H. Oakden (London), Henry W. H. Palmer (Forest Hill), Hubert Palmer (Great Yarmouth), Charles A. Russell (London), Chas. Smerdon Roe (Cambridge), Ernest Spenser (New Southgate), G. V. Taylor (Plumstead), G. E. Thompson (Liverpool), Henry Tonkin (Penzance), Miss M. Watson (Florence), R. S. Webster (Edinburgh), Mrs. Jeanie Welford (London), Walter D. Welford (London), J. C. Warburg (London), Alfred Werner (Dublin), West & Son (Southsea), F. Whaley (Doncaster). The total number, with a few who have sent lantern slides only, of 59.

Belgium.—V. Bennert (Brussels), Eugene Boule (Ghent), J. Bouvart (Antwerp), Leon Bovier (Brussels), Alb. Canfyn (Ghent), Jos. Casier (Ghent), H. Colon (Antwerp), Désiré de Clercq (Grammont), Louis de Clercq (Ghent), Albert de Gryse (Courtrai), Ad. de Kemmeter (Ghent), Ed. de Meuler (Brussels), Ad. de Penaranda (Brussels), C. de Wit (Antwerp), Edwin Ganz (Brussels), Charles Gaspar (Arlon), A. Gautier (Saint Pierre), Georges Hina (Brussels), Raymond Geruzel (Brussels), Georges Glorieux (Brussels), R. Ickx (Courtrai), A. Jossart (Fosses-la-Ville), Alphonse Leirens (Ghent), Hyacinthe Lentz (Tournai), Leon Noel (Antwerp), Alberic Lunden (Antwerp), Jos. Maes (Antwerp), Ferdinand Michel (Namur), Leonard Misonne (Gilly), Georges Oury (Liège), Commandant L. Pavard (Louvain), Henri Peltzer (Brussels), Chas. Pullemans (Brussels), R. Rousseau (Jambes), A. Rubot (Brussels), Edm. Sacré (Ghent), Victor Selb (Antwerp), J'Serstevens (Uccle), Gust van Bellingen (Antwerp), Désiré Vanden Hove (Ghent), Marcel Vanderkindere (Uccle), Jules van Grinderbeek (Louvain), Charles van Loo (Ghent), Gust van Raveslyn (Turnhout), Hermann Wiener (Brussels), Jules Willenz (Antwerp), Zeyen (Liège). The Belgian Association has its various sections at Antwerp, Brussels, Ghent, Liège, Louvain, and Namur, and it will be seen, that in this total of forty-six accepted exhibitors, the three first towns largely predominate.

France.—Baillot D'Estivaux de Willemoune (Chatesuroux), Paul Bergon (Paris), Madame Binder Mesbro (Paris), Paul Bourgeois (Paris), Augustin Boutique (Douai), Victor Bracq (Boulogne), Maurice Bremard (Paris), M. Bucquel (Paris), Auguste Charrel (Le Vesinel), Ferd. Coste (Lacanche), Louis Courtois (Auby), Arth. da Cunbia (Paris), Jules Des-

champs (Boulogne), Pierre Dubreuil (Lille), Oscar Dumont (Lille), René Le Beque (Paris), Emile Leprêtre (Lille), Paul Leroux (Paris), Henri Magron (Caen), L. Mairesse (Lille), Carle de Mazibourg (Paris), Joseph Millon (Boulogne), Lucien Pasquier (Maubeuge), Robt. Pauli (Lille), E. Piaget (Lyon), M. F. R. Pineiro (Paris), J. Quentin (Arrsz), Claudius Tocranchal (Paris), Jules Turlotte (Lille), Ernest Vrac (Caen). Total, 31.

Austria.—Oscar Berl (Vienna), Carl Florianschulz (Vienna), Hermann Heydenhauss (Vienna), Ernest de Juhos (Vienna), Helmer Koch (Vienna), Joh. Langer (Vienna), Leopold Rosenberg (Vienna), Baron Alb. de Rothschild (Vienna), Philipp von Schœller (Vienna), Adolph. Stenicka (Teplitz), Severin Warteresicwicz (Vienna). Total, 11.

America.—John E. Dumont (Rochester), A. L. Eidemiller (St. Paul), Chas. E. Fairman (Washington), Eugene Lee Ferguson (Washington), W. A. Fraser (New York), Hinsdale Smith (Springfield), H. A. Latimer (Boston), Herbert A. North (Philadelphia), W. B. Post (New York), Dexter Thurber (Washington), Henry Troll (Philadelphia), Floyd Vail (New York), Geo. L. Wilson (Jersey). Total, thirteen.

Germany.—Fritz V. Abercron (Hamburg), Gust Haeyn Wilms (Bielefeld), Max Junsnickel (Rathenow), Wilhelm Klementz (Frankfort), Carl Leibrock (Saarbrucken), H. Rosenthal (Guben), Otto Scharf (Crefeld), Edward Zinsel (Darmstadt Hessen). Total, eight.

Holland.—B. Albach (Amsterdam), Ignace Bispinck (Amsterdam), Jan de Grijs (Amsterdam), Baron de Pallandt Rozenheuvel (Arnheim), H. E. Scheidius (Arnheim), Georges Singling (Amsterdam), J. H. B. Wylmans (Middelsburg). Total, seven.

Italy.—Horace Consoli (Giarre, Sicily), Giorgio Goselli (Venice), Comte Louis Primoli (Rome). Total, three.

Switzerland.—Fred Boissonnas (Geneva), Alfred Sules (Bâle), A. Wicky (Berne). Total, three.

Russia.—De Golovallchewsky (Baloum), G. Raieff (Kislovoosk), A. Sohst (St. Petersburg). Total, three.

Portugal.—Joachim Basto (Porto).

To reduce 2300 frames down to 500 shows that the jury dealt unsparingly with the pictures. At the same time, the large number of exhibitors shows a slight tendency to selecting at least one exhibit, even if nine were rejected, and we should say that this has been done to some extent. Certainly to bring the average quality of the work to some extent up to our own Salon, at least another 250 frames would have to be rejected.

The general feature of the English work is that of landscape and seascape, with a tendency towards *genre* in that from our American *confrères*. Amongst the Continental workers, however, there is a good deal of *genre* and portraiture. The English and American work occupying one entire room gives an easy opportunity of comparison with the general run of Continental work; but, as there is no sort of division in the remaining two rooms, it is difficult to follow this any further so as to compare Belgium with France, Holland, &c.

The hanging has been carefully done, the general arrangements providing every convenience, and there is, moreover, a complete absence of skying or flooring. As a rule, the English frames run smaller, and certainly show, as a whole, greater taste in mount and frame. Green plush, blue serge, enamelled cream and gold, and other obtrusive mounts, mar many of the Continental frames. This is made worse also by over-elaboration of frame, and, in some cases, by a howling wilderness of margin. We think the photographic visitors to the Exhibition will learn from the English exhibit that it is better to trust to the merit of the print than to attempt any bolstering up in the mount or frame, which catches the eye and draws the attention away from what should be the centre point of attraction. Some of the exhibits might well be described as a white enamel and gold frame with elegant plush mount containing a photograph.

The catalogue is a very handsome production. The names, alphabetically arranged, are printed in red, with the descriptive matter in black; a rough surface and raw-edge paper is used, and the cover has the inscriptions impressed and not printed. It is, in fact, quite a creditable result for both the Association and the printer. The titles of the pictures are, in most cases, translated into French; but in some cases, where exact translation is difficult or impossible, the original English, Dutch, &c. is quoted. Another point is, that not only are the names given alphabetically, but the numbers follow consecutively, so that, as far as reference to the catalogue goes, it is perfectly easy to follow the frames on the wall.

Space will not allow of a detailed criticism of the exhibits, and a few general notes must suffice. Prominent amongst the English exhibitors are Ernest R. Ashton (Scenes in Cairo), E. Evelyn Barron (Seascape), Harold Baker and Charles H. Oakden (Architecture), Chaffin & Sons (Large Portraiture), John H. Gear, Thomas E. Ellis, W. Dawes, John Carpenter, G. L. Hankins, R. S. Webster, E. Cecil Hertslet, A. J. Jeffreys, Charles Job, and others, with the class of landscape that is now so much in vogue in England, West & Son (Marine), Reginald B. Lodge (Bird Studies), Fred Marsh (Large Flashlight Pictures). We have seen better work by A. R. Dresser, and there are a few other English exhibits barely worth hanging.

The tendency of the American work is towards *genre* and figures, and there are good examples by A. L. Eidemiller, Charles E. Fairman, John E. Dumont, Eugene Les Ferguson, Dexter Thurber, and Floyd Vail. W. B. Post is largely represented, and by some very excellent work; but he, together with George L. Wilms, sticks closely to landscape.

Amongst the Continental workers, the most striking pictures are those of B. Albach (Holland), Fred. Boissonnas (France), A. Bouligne (France), Leon Bovier (Belgium), Victor Bracq (France), Louis Courtois (France), Désiré De Clercq (Belgium), Ad. de Kemmeter (Belgium), Giorgio Goselli (Italy), Hermann Heydenhauss (Austria), R. Ickx (Belgium), Leon Noel (Belgium), L. Maviesse (France), Carle de Mazibourg (France), Georges Millon (France), who seems to follow the Millet school, Georges Owry (Belgium), Commandant Pavard (Belgium), R. Rousseau (Belgium), Edm. Sacré (Belgium), Victor Selb (Belgium), Claudius Touranchet (France), Gust Van Bellinger (Belgium), Ernest Vrac (France), — Zeyen (Belgium), and, to single out two or three of those endeavouring to strike out into new paths for themselves, we should mention Messrs. Bovier and Sacré.

The display of slides sent in for exhibition took place, on Sunday last, at the rooms of the Association, in the Palais du Midi. From England there were Architectural and Marine, by Bertram C. Wickisson, London; Flowers and Marine, by J. T. Field, London; Street Scenes, by Walter D. Welford, London; and Various, by Algernon Brooker, Hastings. Amongst the more striking exhibits from abroad were the Figure Studies of Edward Ganz, Brussels; the Flower Studies of William A. Fraser, New York; Marine Studies of J. Latimer, Boston; and *Genre* Subjects of Leonard Mizonne, of Gilly, Belgium.

In the evening a private dinner took place at the Hotel de Vienne, when the officials, the jury of admission, and Mr. and Mrs. Welford were present—an enjoyable but informal evening. Mr. Welford was presented with a special souvenir medal of the Society, for his efforts in England on its behalf.

For the souvenir album of reproductions, works by the following have been chosen: England—Geo. Hankins, W. M. Harrison, Chas. Job, Chas. Smerdon Roe, Geo. E. Thompson, R. S. Webster, Mrs. Welford, Alf. Werner. America—J. E. Dumont, H. A. Latimer, Eugene L. Ferguson, Geo. L. Wilms.

NOTES FROM THE WEST OF SCOTLAND.

Judging from the spirit, in fact almost enthusiasm, with which our local photographic societies have entered into the idea of holding conversaziones in lieu of lantern demonstrations for their popular nights, it would appear as if, in future at least, so far as the West of Scotland is concerned, there will be much fewer lantern exhibitions.

The recent social meeting of the West of Scotland Amateur Society was quite a big thing, and must have cost a considerable sum to organize; but, then, this popular Society is flourishing, both as regards numbers of members and its funds.

The Paisley Exhibition, which has been open for the last month, has just been brought to a close. Among other good things provided by the Council was a grand display of animal studies by Mr. Charles Reid, of Wishaw, who attended personally on the occasion, when about two hundred of his best pictures were thrown upon the screen.

With the fine weather experienced during the holidays, there has been quite a flutter among amateur workers, who are mere *en évidence* this year than ever. Hand cameras are seen everywhere, and some of these are of considerable size. The modest quarter-plate, so universally adopted as the handiest size for what was originally designated detective cameras, is fast being supplanted by the half-plate, for many of the best workers in the district have found out that a heavy camera is easier held steady than a feather-weight one.

Among the new forms of hand cameras just placed on the market is one made by Messrs. Vérel, of the Albion Albumenising Company. The main feature of this excellent arrangement consists in the camera folding up in such a manner that all cases or covers, and other adjuncts, so often seen in such instruments, are entirely dispensed with by an ingenious device, the dark slides are stowed away inside the camera, and, when such is folded up, no one would ever suspect that a camera was being carried, its appearance resembling a lady's bonnet box of small dimensions.

Mr. William Riddell, late of Riddle & Rae, has started business on his own account, and has just issued a very comprehensive catalogue which contains some up-to-date novelties.

The X rays craze is dying down among photographers generally in this district.

Mr. William Carmichael, of the chemical department of Messrs. George Mason & Co., has recently been giving some very interesting demonstrations on the making of acetylene gas.

PHOTOGRAPHIC EXHIBITION AT BEVERLEY.

The Beverley Photographic and Sketching Society held its third annual Exhibition in the Assembly Rooms on Easter Monday, the opening ceremony being performed by the Rev. Dr. Nolloth, who was formally introduced by Captain Forrest, one of the Vice-Presidents of the Society.

The exhibits were effectively staged in tiers on stands draped with art muslin, and the large room was rendered the more picturesque by the introduction of a number of choice palms and plants in bloom, together

with a quantity of bunting kindly lent by Mr. C. J. Newbald. The specimens exhibited included excellent examples of the photographic, painting, and kindred arts, and in the competitive section numerous silver and bronze medals were awarded as prizes. The entries were very large, and many of the competitors were of high standing, having gained distinction both at home and foreign exhibitions. The side rooms were set apart for lantern exhibitions of the prize slides, given at intervals, and for an interesting demonstration on "Photo-ceramica," given by Mr. W. Ethelbert Henry, C.E., of London. One attraction which had been announced, a lecture and demonstration of the Röntgen X rays, had unfortunately to be postponed, in consequence of the inability of Mr. T. W. Ireland, who was to have given it, being unable to procure certain of the requisite apparatus in time. The Society, however, intend to hold it at an early date.

The following were the awards:—

OPEN CLASSES.

Landscape, Seascape, and Architecture.—Silver medal, W. J. Warren, Leeds; extra silver medal, George L. Wilms, Jersey, U.S.A.; bronze medal, W. Smedley Aston, Birmingham; extra ditto, Charles Rumbold, Great Yarmouth; certificate, Floyd Vail, New York, U.S.A.

Portraits, Figure Study.—Silver medal, T. Lee Symes, Tyldesley, Lancashire; extra ditto, Fred Marsh, Henley-on-Thames; bronze medal, E. Lee Ferguson, Washington, U.S.A.; certificate, Mrs. W. D. Welford, London, and J. H. Coath, Liskeard.

Hand-camera Work.—Silver medal, W. Thomas, London; bronze medal, C. F. Inston, Liverpool.

Enlargements.—Silver medal, Albert Durn, Wooton-under-Edge; certificate, J. B. Briggs, Lancaster.

New Photography.—Silver medal, T. E. Freshwater, London; bronze medal, A. Campion, Royal Indian Engineering College, Staines.

Lantern Slides (set of six).—Silver medal, G. Hankins, London; bronze medal, E. R. Bull, London; extra bronze medal, J. H. Gear, London; certificate, John Ward, Erdington, Warwickshire.

Paintings, Drawings, and Sketches.—Mr. Tempest, Beverley; Mr. T. L. Flather, Scarborough; Miss Bessie Cross, Hull; Miss E. R. Marshall, Reverley; Miss Ethel Beaumont, Beverley.

MEMBERS' CLASSES.

Landscape, &c.—1. Maurice J. Stephenson, Beverley; 2. C. Goulding, F.C.O., Beverley; 3. G. Dawson, Beverley.

Portraits.—1. Mrs. W. Thompson, Molescroft; 2. G. F. Duck, Bishop Burton; 3. G. Dawson.

Excursion Work.—Bronze medal, C. Goulding.

Enlargements.—Silver medal, H. J. Mann, Beverley; bronze medal, T. Tanfield.

Instantaneous.—Bronze medal, C. Goulding; 2. R. Railston Brown, C. E. Bridlington; 3. J. Kinsley, Bridlington Quay.

Lantern Slides (set of six).—1. A. E. Hobson; 2. C. Goulding; 3. R. Railston Brown; 4. Thomas Tanfield.

THE W. H. HARRISON FUND APPEAL.

	£	s.	d.
Amount already acknowledged	30	3	0
F. Beasly, Esq....	1	1	0
A. Horsley Hinton, Esq.	1	1	0
Hon. Percy Wyndham	5	0	0
J. H. Martin, Esq.		5	0
R. Hawkins, Esq.		10	0
W. R. Tomlinson, Esq.		10	0
"Grip"		5	0
Alfred Watkins, Esq.	1	1	0
	£39	16	0

Further contributions will be gratefully acknowledged by

FREDK. H. VARLEY, 82, *Newington Green-road, London, N.*

The Inquirer.

**** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

PHOTOGRAPHY IN BARBADOES.—"BARBADOES" asks: "Could you give the names of some of the best photographers in Barbadoes? Do you think there is any opening for an operator of ability? and what salaries are given? Is there any chance of opening up on own account, or is it overrun? What is the distance, and which is the best route?"—Perhaps some travelled reader can supply the desired information.

CHLOROPHYLL.—W. H. G. writes: "Allow me to thank Mr. F. E. Ives for his reply (p. 208) to my previous query. It seems I have been unnecessarily worrying, not only myself but others, in a vain search after 'blue myrtle' which nobody recognised, while I have bushels of the article I want, but under another name, in my own garden. Now that the common names of the 'blue myrtle' are placed on record—Vinca minor, or the common periwinkle—many others like myself may be saved a lot of trouble. I want to use the chlorophyll chiefly for collodion films, but do I understand Mr. Ives to mean that it is of no use in conjunction with gelatine, however applied? Of course, I know it will not dissolve so-well-in-the emulsion, but may it not be effective when applied as a bath?"

CARBON PRINTING.—J. C. writes: "I have recently taken up carbon printing, which seems to me a process specially adapted to the wants of the amateur. Although I have mastered the technical difficulties of development and transfer, I cannot say that I am by any means satisfied with the general results I obtain. My negatives are of ordinary average density and give good brilliant prints with the gelatine or collodion print-out papers, especially the latter, but in carbon they are either weak and flat or heavy, and free from sparkle according to the depth to which the printing is carried. I have tried all depths of printing, in fact from the same negative I have made different exposures each with a different 'tint' of the actinometer, and the results have been as I have stated, all unsatisfactory and only varying in degree of exposure. Does the process require a special kind of negative? Any help you can give me I shall greatly appreciate."

Our Editorial Table.

THE PHOTOGRAPHIC REFERENCE BOOK.

Compiled by W. A. Watts, M.A. London: Iliffe & Son, 3, Bride-street, E.C.

THIS is a work of nearly 300 closely printed pages, mainly compiled from those columns of our contemporary, *Photography*, which are devoted to the eliciting of information by means of questions and answers. The information has been classified into twenty chapters, thus facilitating reference. For example, we have treated, under separate sections, "cameras and apparatus connected therewith," "lenses (stops and optical matters)" "process work" "varnishes and cements," &c., &c. The matter has been very judiciously selected, and the photographer will pick up many a useful hint from the book, which teems with valuable information and suggestions on photographic technique, partly new, but chiefly the outcome of past experience and experiment.

THE KOH-I-NOOR RETOUCHING PENCILS.

L. & C. Hardtmuth, 12, Golden-lane.

A SET of the Koh-i-noor retouching pencils has been submitted to us by Messrs. Hardtmuth. These pencils, which are made of compressed lead, have a useful range of softness and hardness for retouching work, for which purpose, according to the evidence of expert retouchers, they are well adapted.

RÖNTGEN PHOTOGRAPHS.

By Professors Waymouth Reed & J. P. Kuenen. Dundee: Valentine & Sons.

THIS is a series of well-executed collotype reproductions, by Messrs. Valentine, from negatives made by the gentlemen named, who are attached to the University College, Dundee. The pictures, of their kind, are very good, and the subjects are somewhat uncommon: a star fish, a flounder, a frog, tortoises, a cat's tail, and a baboon's hand being among those of which the osseous structures have been laid bare by the remorseless Röntgen rays.

THE CATHCART DRY PLATES.

F. W. Vérel & Co., Cathcart, near Glasgow.

FROM Messrs. F. W. Vérel & Co., Cathcart, near Glasgow, we have received, for trial, samples of their plates, the Cathcart "ordinary," and "special rapid." The former is a plate of medium rapidity, and is a useful, clean, and easily developable plate for all-round studio and outdoor work. The "special rapid" is extremely sensitive and fine in the grain, and, for very quick exposures, will be found to yield excellent results. Judging by the samples, the Vérel plates are prepared with scrupulous care, and are therefore well qualified to hold their own in the estimation of photographers.

Fitch's Special Extra Rapid Films.

E. H. Fitch & Co., Seldon House, Fulwood's-rents.

During the holidays we tried some of Mr. Fitch's latest make of celluloid films, and, as heretofore, found them beautifully clean and regular, and of a degree of rapidity which should satisfy all reasonable exigencies in the way of speed. The size we used was the once popular $7\frac{1}{2} \times 5$, and the films remained perfectly flat in an ordinary dark slide. Mr. Fitch has certainly mastered the art of turning out a celluloid film upon which, in the way of technical excellence, it would be difficult to improve.

Encyclopëdie der Photographie, Vols. XVIII. and XIX.

Wilhelm Knapp, Halle a/S.

These two volumes are valuable additions to this comprehensive work on photography. No. XVIII., entitled *Der Silberdruck auf Salzpapier*, by Baron von Hübl, treats of the preparation of the various kinds of salted papers, and the processes involved in their use for the production of photographs. Albumenised, gelatinised, resinised, and other varieties of salted paper are described, and those who still see beauty in a silver print (and are there not many?) will find in these pages reliable information for making, keeping, and toning. At the close of the second part, the author gives a short but appreciative expression of opinion on the value of salted papers compared with other printing surfaces, in the following terms: They are not of universal use, but they will be utilised where their advantages recommend them. They may be used instead of gelatino-bromide paper, because of their safety in printing and simplicity; instead of matt collodion paper, because of greater ease of preparation; and, lastly, instead of platinotype, where the negatives are unsuitable, when brown or blue-toned prints are required, and to avoid uncertainty in printing. Volume XIX., *Die Anwendung der Photographie zu Militärischen Zwecken*, by Premier-lieutenant Kiesling, treats of the many applications of photography in military affairs. It contains chapters on the reproduction of maps, plans, &c., photogrammetry, balloon, kite, and rocket photography, microscopic reductions, the photographing of bullets in flight, and other subjects. There is also an account of the experimental use of photography in the Prussian army before and during the Franco-Prussian War, and its subsequent use by other nations for military surveys, &c. The work contains a number of illustrations, and is a good reference book for those interested in the subject.

Die Chromo-lithographie.

By Friederick Hesse. Halle a/S.: Wilhelm Knapp.

We have received the first number of this work, which promises to give a comprehensive account of chromo-lithography in its several branches, with practical directions. The number describes the principles upon which lithography and chromo-lithography are based, and gives an account of materials, tools, &c. There are a number of illustrations in explanation of the text, and the work will contain fifteen specimens of chromo-lithography, two of which are issued with the first part.

Catalogue Received.

Andrew Riddell, 139, West George-street, Glasgow.—Mr. Riddell's catalogue is in some respects novel in its arrangement. The first few pages are devoted to illustrations of some ninety odd hand cameras, and are followed by descriptions of them. Studio and field cameras are also described in the same section, which is printed on pink paper. Lenses, photographic stationery and sundries have each separate sections, printed on distinctively coloured papers. By these and other means, Mr. Riddell's catalogue, which is very complete, is made extremely easy of reference—a feature that should be highly appreciated.

News and Notes.

On Saturdays, April 18 and 25, at 7.30 p.m., Mr. E. J. Wall will deliver two lectures on *Colour Photography as applied to Printing* at the Photographic Process School, Central Art Department of the Technical Education Board, 6, Bolt-court, Fleet-street, E.C.

Our Japanese contemporary the *Shashin Sowa*, in its last number, was troubled by the failure of its printers to render a half-tone block successfully. It thus apologises:—"Dur illustration, showing difference the two brands of P. O. P. did not came out well as we have seen in proof, so we shall renew the insertion of the same by comming number."

Royal Photographic Society.—Photo-mechanical Meeting, Tuesday, April 21, at eight p.m. *Photo-mechanical Notes of Historical Interest*, by T Bolas, F.I.C., F.C.S.

Queensland Amateur Photographic Society, Brisbane.—The following office-bearers have been elected for the ensuing year, viz.:—*President:* Mr. D. Mactaggart.—*Vice-Presidents:* Miss Stennett and Mr. M. E. Brookes.—*Council:* Dr. Thomson, Dr. Wheller, Mr. C. J. Pound, and Mr. D. R. Eden.—*Treasurer:* Mr. W. Connolly.—*Hon. Secretary:* Mr. J. J. Campbell.

Walworth Junior Postal Camera Club.—The Hon. Secretary and Treasurer, P. C. Cornford, 36, Inville-road, Walworth, London, S.E., writes: "There are now two vacancies for membership in the above Club, and the mention of the fact through the columns of your valuable paper will be deemed a favour. I shall be pleased to send all particulars on receipt of a post card."

New American Photographic Publications.—The *Practical Process Worker* is the title of a new monthly publication devoted to process work; it is published by the Scovill & Adams Company, New York.—The first number of the *Professional Photographer* has been sent us. It aims to be a practical journal for professional workers, and is published by the Nesbitt Publishing Company, Buffalo, N.Y.

Acetylene.—A German writer remarks that, for the production of a light of one normal candle power, 0·6 litre of acetylene is required per hour if a proper burner is used. For the same lighting power with ordinary gas burners ten to twelve litres of coal gas are consumed. There are, however, various qualities possessed by acetylene which are of a somewhat dangerous nature, namely, its action upon copper or copper alloys. For instance, with copper alloys it forms a brownish substance which is very highly explosive; therefore such metals are unsuitable for use within the conduits or for glow bodies if acetylene is employed as a lighting material. Iron is of neutral conduct towards acetylene. It is well known that a certain mixture of acetylene and air is explosive, the highest explosive power being reached in a mixture of one part of the gas to twelve parts of air. Also, like all carburetted hydrogen gases, acetylene is poisonous, though not so poisonous as ordinary coal gas in even lesser quantities. The danger of liquefied acetylene gas is considerable, for, if it is stored in a steel cylinder at six to seven hundred pounds' pressure, in the event of a fire breaking out in a building containing it, it would be decomposed, forming carbon and hydrogen; the latter would have a pressure of 20,000 pounds per square inch, which would burst the cylinder and cause widespread damage. Even a slight leak in the cylinder would be very dangerous, for three or four per cent. of the gas in the air would cause a violently explosive mixture. Acetylene gas can also be exploded by fulminate of mercury, and the gas also makes explosive compounds in coming in contact with copper.

Central Art Department, Bolt-court, Fleet-street, E.C. (Guild and Technical School of the National Society of Litho-Artists, Designers, and Engravers, under the joint control of the Technical Education Board L.C.C. and the National Society of Litho-Artists, &c. Spring Session, 1896).—The Schools reopened on Monday, April 13. The Sketching Class will be held, as usual, on Mondays, from 7 to 10 p.m. The Committee wish it to be thoroughly understood that members of the Life, Antique, and Design Classes can join the Sketching Class without extra fee. The arrangements for this class are in the hands of the students, and the Art Director would be glad to meet intending members to consider the subjects for the ensuing session, and to form a strong Committee. Life Class, Tuesdays and Thursdays, 7.30 to 10 p.m. Antique, Wednesdays and Fridays, from 7 to 10 p.m. Study and Practice of Design, Fridays, from 7.30 to 10 p.m. Process Drawing, Tuesdays and Thursdays, 7.30 to 10 p.m. Perspective Class, Mondays, 7.30 to 9.30 p.m. Study and Practice of Litho Drawing, Tuesdays and Thursdays, 7 to 10 p.m. Study of Aquatint Engraving, as applied to Letterpress Printing, Tuesdays, from 7.30 to 10 p.m. Photo Process School, Session 1895-96. The Second Term commenced on Monday, April 13. These Classes meet as follows:—Mondays, 7 to 8.30 p.m., Line Etching on Zinc; Tone Etching on Zinc, Copper, and Brass. The Class is limited to Twelve Students; should there be a greater number of entries, an extra class will be held from 8.30 to 9.45. Tuesdays, 7. to 8.15 p.m., Photo-lithography in Line and Half-tone. Tuesdays, 8.15 to 9.45, Half-tone Negative-making. Wednesdays, 7 to 8.15 p.m., Line and Half-tone Negative-making. An additional class will be held from 8.15 to 9.45 if there are more than twelve entries. The Secretary will be in attendance every evening from 7.30 to 9.30, and will gladly furnish any further information.

Patent News.

The following applications for Patents were made between March 25 and April 8, 1896:—

Film Cameras.—No. 6489. "Improvements in Film-changing Photographic Cameras." Complete specification. C. Beck, W. Beck, jun., and J. T. Clarke.

Projection Apparatus.—No. 6503. "Improvements in the Mechanism of Chrono-photographic, Kinetoscopic, and Lantern Projection Apparatus." G. W. de Bedts.

Cameras.—No. 6582. "Improvements in Photographic Cameras." L. J. R. Holst.

Kinetoscope.—No. 6604.—"Improvements in Apparatus for Exhibiting Photographs to obtain the appearance of Objects in Motion." A. G. Bessemer, jun.

The Parastudio.—No. 6608. "The Parastudio for controlling the Light in connexion with Photography, as being applicable to Outdoor Portraiture." W. Watson.

PHOTOGRAPHIC PRINTS.—No. 6651. "Improvements in Chemical Compositions to be used for Preparing the Surface of suitable Material for Photographic Prints." Complete specification. P. E. SCHOENFELDER and E. KEHLE.

REPRODUCING DRAWINGS.—No. 6657. "Improvements in Photographic Apparatus for Reproducing Drawings, Engravings, and the like." E. POTHIER.

COPYING ENGRAVINGS.—No. 6662. "Mode of and Means or Apparatus for Producing Photographic Negatives from Engravings and the like." F. H. WOOD.

PRESSURE FRAMES.—No. 6766. "Improvements in Pressure Frames for Photographic or other Purposes." L. A. MARION, H. GUIBOUT, G. BISHOP, F. BISHOP, and J. P. KIRK.

CAMERAS.—No. 6791. "Improvements in Hand and other Photographic Cameras." W. J. LANCASTER.

CAMERAS.—No. 6805. "Improvements in Cameras for Photographic Purposes." G. H. BANISTER.

PHOTOGRAPH FRAMES.—No. 6907. "A Frame for Photographs made of Perforated Cardboard, with or without a Design for Needlework printed on it." E. GRIFFITHS.

PRINTING FRAMES.—No. 6977. "Improvements in Photographic Printing Frames." W. TYLAR.

MOUNTS.—No. 7141. "Improvements in Picture Frames, Photographic Mounts, and the like." N. MYRSTEDT.

PHOTOGRAPHIC APPARATUS.—No. 7172. "Improvements in Photographic Apparatus." F. TOWNSEND.

AUTOMATIC PHOTOGRAPHS.—No. 7271. "An Apparatus for Automatic Production of Photographs." Complete specification. H. F. C. SASSE.

SHUTTERS.—No. 7309. "Certain Improvements in Photographic Shutters." E. UNDERWOOD.

SPRING LENS CAP.—No. 7314. "The Spring Lens Cap (Photographic)." E. HODGSON and E. HODGSON.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

April.	Name of Society.	Subject.
20	Camera Club	*The Coming Total Solar Eclipse.* Captain E. H. Hills, R.E.
20	Richmond	Open Evening.
21	Bournemouth	Discussion on Exhibition.
21	Gospel Oak	Exhibition of Prize Slides.
21	Hackney	Prize Slides.
21	Leeds Photo. Society	Discussion on Developers. Opened by Dr. Thresh.
21	North Surrey	Annual General Meeting.
21	Royal Photographic Society	*Photo-mechanical Notes of Historical Interest.* T. Bolas, F.I.C., F.C.S.
22	Croydon Camera Club	*An Introduction to Photo-stereography.* G. W. Watson.
23	Bradford	Open Night.
23	Camera Club	Sixth Annual General Meeting.
23	Ireland	Lantern Slides by Members.
23	Leeds Camera Club	Annual Meeting and Election of Officers.
23	Leigh	Business Meeting.
23	Liverpool Amateur	Explanatory Show of Photographic Novelties. James A. Sinclair.
23	London and Provincial	*Micro-photographic Reductions.* G. W. Atkins.
23	Woolwich Photo. Society	*The Chemistry of Every-day Photography.* W. H. Dawson.
24	West London	*Mountain Scenery.* Leslie Selby.
25	Borough Polytechnic	Excursion: Blackheath and Chislehurst.
25	Camera Club	Last day for sending in Pictures intended for Annual Exhibition.
25	Leytonstone	Excursion: Richmond Park. Leader, B. Harwood.

ROYAL PHOTOGRAPHIC SOCIETY.

APRIL 14,—Ordinary Meeting,—Captain W. de W. Abney, C.B., F.R.S., in the chair.

Seven new members were elected, and eight candidates were nominated. It was announced that the Isle of Thanet Photographic Society and the Leeds Camera Club had been admitted to affiliation.

The ASSISTANT SECRETARY (Mr. R. Child Bayley) read a note on a method of ascertaining

THE MELTING POINT OF GELATINE SOLUTIONS.

He said that any one who had had to ascertain the temperature at which various solutions of gelatine passed from the solid to the liquid state knew that it was by no means easy to do so with any great amount of accuracy by the means usually employed—a test tube, thermometer, and water bath—while the time occupied in making a number of such determinations was considerable. Having to examine a number of jellies with a view to ascertain the influence of alum and other hardening agents upon them, he had devised a simple apparatus which he exhibited, and which, after repeated use, had been found reliable. It consisted of a water bath capable of being heated by a spirit lamp or Bunsen burner without the hot air or products of combustion reaching its largest side; along this side, at a distance of one inch from the top, was ruled a straight line, and one or more thermometers were so supported in the bath that their bulbs were as close as possible to the position of the line on the metal, but inside the bath. To use the apparatus, the vessel was laid upon its side, and, by means of paper tubes, the jellies to be tested were allowed to solidify in discs, with the bottom edge of each just upon the line on the tank. When the gelatine was set, the paper could be removed, and the tank stood upright and filled with water, and all that was then necessary was to heat the water and note the temperature at which the discs of jelly commenced to slide down the side of the bath.

Professor W. C. ROBERTS-AUSTEN, C.B., F.R.S., then described a method of

RECORDING HIGH TEMPERATURES BY PHOTOGRAPHIC MEANS.

He first referred to the fact that for measuring temperatures exceeding about 400° it was neccessary to resort to methods other than the ordinary mercurial thermometer, and mentioned two such methods which could be readily adopted. The electrical resistance of a platinum wire could be ascertained, and the increase of its resistance caused by heating would be a measure of temperature; or wires of two dissimilar metals could be twisted into a junction, which, being heated, would behave as a battery and generate electricity, the strength of the current so generated being again a measure of temperature. The method which he had found best suited for the purpose, was then illustrated by means of a series of drawings. The free ends of a thermo-junction, formed of wires of platinum alloyed with iridium or rhodium, were attached to a galvanometer enclosed in a camera. From a source of light external to the camera a ray was reflected from a mirror through the lens on to a movable mirror of the galvanometer, another ray being similarly thrown on to a fixed mirror, the light from which could be periodically interrupted. Both rays passed through fine vertical and horizontal slits, and thence on to a photographic plate contained in a carrier capable of being moved upwards by means of a driving or water clock. When the thermo-junction was heated it became a battery, and the strength of the current generated was a measure of the temperature to which it was raised. The result was that, if both spots of light started fair, the one from the fixed mirror would remain in a definite position, while the one from the movable mirror of the galvanometer would register the temperature to which the thermo-junction was heated. It is difficult in this brief report, and without the use of diagrams, to adequately describe Professor Roberts-Austen's method, by which he said it was possible, at a temperature of 1000 degrees, to obtain a record trustworthy to a tenth of a degree. He proceeded to show a series of slides illustrating the industrial application of the apparatus in connexion with the ascertaining of the temperature of the air supplied to blast furnaces; and, as an example of the service which photography had thus rendered to industry, he stated that in some cases it had rendered possible a reduction in the consumption of coal at the rate of one hundredweight per ton. With regard to investigations generally, it was known that, if a salt was placed at the bottom of a cylinder of water, the salt would gradually diffuse upwards until it was uniformly distributed through the water, and precisely the same thing occurred with metals. Experiments had proved that, if a heavy metal was placed at the bottom of a molten, mass the heavy metal would be diffused up, against gravity, throughout the mass; and it was of extreme importance to metallurgists to be able to measure the temperature at which the diffusion took place, and photography had rendered it possible to do this with great accuracy. For all his measurements he referred finally to the air thermometer as an arbiter.

After some remarks by the EARL OF CRAWFORD and Mr. HEARSON,

Professor ROBERTS-AUSTEN, at the suggestion of the Chairman, referred to the diffusion of metals in the cold, and mentioned some curious instances of solids "walking into" one another. For example, if a diamond was placed on a piece of iron, and the whole heated to about 800°, the diamond would gradually "walk into" the iron; similarly, if a cylinder of pure lead was fused to a plate of gold, and the whole heated to 90° or 100° below the point at which the lead would melt, in about a month an appreciable quantity of gold would be found at the top of the lead. Further, if cylinders of lead and gold were placed accurately together in a vacuum tube, and heated only to 40°, in a day they would unite so firmly that a strain equal to one-third of the breaking strain of lead would be required to sever them.

The CHAIRMAN referred, in complimentary terms, to the utility of the methods adopted by Professor Roberts-Austen, to whom a cordial vote of thanks was then passed, and the meeting closed.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APRIL 9,—Mr. T. E. Freshwater in the chair.

DEFINITION OF LENSES.

The HON. SECRETARY showed a print of a 7½×5 negative, taken with one of the new Ross-Zeiss convertible anastigmats used as a single lens. The focus of the single combination was 11½ inches, and an exposure of one second was given with full aperture, *f*-12·5. In answer to a question, he said the two combinations of the lens were not of the same foci, being 9 inches and 11½ inches respectively, and forming together a lens of 5¾ inches focus. Until the introduction of this lens, he thought there was no single lens which at full aperture would give such fine definition as that shown in the print.

The opinion of those present was that it was of very fine quality. The full aperture was equal to the open tube.

The HON. SECRETARY said that one advantage was that all flare was done away with, there being no stop used.

Mr. ATKINS showed what the old form of Ross's rapid symmetrical would do in the way of copying black-and-white subjects, and passed round several examples. The lens was of 8½ inches focus.

HALATION.

The HON. SECRETARY raised the question as to which gave the most halation, exposing through the glass plate or in the ordinary way.

Mr. A. MACKIE said presumably there would be less in exposing through the plate.

Mr. R. P. DRAGE referred to a suggested method for the prevention of halation, which was to place a piece of thin silvered glass in optical contact with the back of the plate with the aid of glycerine. He also mentioned an old experiment in which the emulsion was coated on a silvered plate.

A discussion as to the practical utility of this method ensued, it being

mentioned that the oblique rays would be reflected on to a different part of the film than that through which they entered, the effect being less noticeable the nearer to the centre of the plate.

The HON. SECRETARY believed that the use of films got rid of a lot of halation, and said that, of three exposures recently made on one subject with a backed and an unbacked plate and a film, only the unbacked plate showed halation.

DEVELOPMENT.

A discussion took place on the question of protracted development.

Mr. HARVEY had tried watering the developer, but generally got fog through long development, although he was in the habit of covering up the plate. He asked whether, under the following circumstances, intensification would be practicable. In developing a plate he had accidentally allowed twice the proper amount of pyro, and consequently got a fearfully dense negative. This he had reduced, but prolonging it too much had reached the opposite extreme. He had tried printing under green glass, but with no better success.

It was thought that intensification might improve it, and it was recommended to try bromide paper as likely to give a better result than gelatine, which was the paper used.

A short discussion followed on the relative permanence of albumen and gelatino-chloride papers.

PHOTOGRAPHIC CLUB.

APRIL 8,—Mr. Frank Haes in the chair.

Mr. J. R. WILLIAMS asked the members' opinion upon a recent experience he had had in

PHOTOGRAPHING MICROSCOPIC SUBJECTS.

He found that for certain subjects, viz., more or less opaque objects upon a clear ground, there was a large degree of solarisation or halation, and that the outlines of the image became blurred. He had tried the experiment of substituting for the ordinary caramel backing a piece of silvered glass, brought into optical contact with the sensitive plate by a film of glycerine. He obtained by this means results in which there appeared to be little or no halation or blurring, and he asked for some explanation of it.

Various possible explanations were suggested.

Mr. MACKIE thought possibly that, owing to the extra thickness of glass behind the plate, the light became reflected from the silver backing in so diffused a manner as to be less noticeable, in the same way as a flare spot in a lens is modified by altering the position of the diaphragm, although the flare is not actually done away with.

Mr. WILLIAMS said, in reply to further questions, that he preferred the caramel backing, and had only adopted the other method for experimental purposes.

A member referred to the recent show of lantern slides by Mr. Evans, and said it was noticeable that this gentleman had succeeded in avoiding all the defects generally due to halation, although he had worked both plates and films without backing upon most difficult subjects. Mr. Evans's explanation at the time was that he gave sufficient exposure, and always developed his plates in a tentative manner. In addition to this, he always made the photographs at a time when the incidence of the light was suitable.

Mr. FOXLEE drew attention to the fact that Mr. Evans also used a very long-focus lens, and it was pointed out that this might assist in minimising the spreading action of the light through the film.

Mr. MACKIE pointed out out that in the recent Watkins's competition, which had been held under the auspices of the Club, it was quite clear, from the results, that halation was influenced by development to a certain extent. He instanced the case of negatives where all the effects of halation which were likely to occur were overcome by the use of a very highly restrained developer. He also said that it was notorious that some men could not make a negative without the effect of halation being noticeable, whereas others with similar makes of plates and similar subjects contrived, by manipulating their exposure and method of development, to avoid the defect altogether. Halation was not due to any one particular cause, but to an aggregation of causes.

Brixton and Clapham Camera Club.—March 31.—Messrs. Milne & Co., of Balham, demonstrated the working of their

VENUS ARTISTIC PRINTING PAPER.

This paper somewhat resembles Mezzotype, but is prepared in an entirely different way, and is said to give prints which are really permanent. It is supplied in four grades, from a smooth matt to a rough Whatman's surface, and the working is very similar to that for ordinary silver papers. Vigorous negatives give the best results, and printing should be done in a strong light to the depth wanted in the finished picture. The prints are soaked in water to get rid of free silver, and then toned in the combined bath specially prepared by the Company, or in any gold or platinum bath suitable for silver papers. Toning takes from six to ten minutes, a good range of tones—sepias, browns, purples, blacks, &c., being got according to the bath used and time taken in toning. The prints are next rinsed in water and fixed in :—Hypo, 2 ounces; borax, ½ ounce; water, 20 ounces; and afterwards washed for about two hours. Drying can be done by heat, the paper containing no gelatine. The working of the paper, as shown by Mr. Milne, was very easy and certain, and the rendering of detail, good tones, and purity of the whites were specially noticed and indicate the paper to be a very useful one.

Bromley Camera Club.—On April 10 a lecture was given by Dr. CHARTERS-WHITE on

PHOTO-MICROGRAPHY

at the School of Science and Art, Tweedy-road, Bromley. The members of the Club turned up in full muster with their friends, nearly 200 being present altogether, including a great many of the local doctors. The lecture, which was illustrated by the lecturer's own slides, including, among others, anatomical subjects, parts of insects, and crystals, proved to be most interesting and highly instructive, and was greatly appreciated by the audience.

Camera Club.—The members of the Camera Club, like all other mortals who are not under the necessity of keeping their noses to the grindstone, have mostly been away holiday-making, and consequently the place has been almost empty save for the visitors who have been attracted by Mr. Henry Stevens's remarkable exhibition of pictures, which still occupies the walls of the large room. But of evening meetings there have been few, the last one of importance before Easter being devoted to a paper by Major Lysaght and Mr. Henry E. Davis, which attracted a good many interested listeners. Mr. DAVIS was the spokesman, and described, with much felicity and an occasional little joke, a series of peregrinations which he and his gallant comrade had made among the beautiful environs of London. This paper was an object-lesson to those on pleasure bent, who in a few days would be running across to the Continent, or to far-off resorts, in search of beauties which can be had in plenty within half an hour's rail of the metropolis. But not only were the views of topographical interest, for some of them were highly artistic, and the section devoted to the details of hop-picking were instructive as well. On April 2 Captain Wilson Barker was down for a paper entitled,

CLOUD FORMS AND TROPICAL WEATHER,

but so many members had by this time fled from town that it was deemed advisable to postpone the reading of it until the coming Conference, when a large audience may with confidence be counted upon. It was a pity that so few members assembled last week to hear Mr. A. Mallock's discourse concerning the advantages of being able by the camera to secure a true vertical line. Some may have thought that there was no necessity to raise such a question, because rectilinear, symmetrical, and other lenses of the same type are constructed with the express object of reproducing vertical and other straight lines with the utmost exactitude; but that is not quite what Mr. Mallock intended to convey when he gave to his interesting paper the somewhat alarming title,

ON A PHOTOGRAPHIC METHOD OF FINDING A TRUE VERTICAL LINE, &c.

His real object was to point out how the camera can be made into a most vigilant detector of any line in a building which ought to be vertical, but which, from any cause, has deviated from the perpendicular position which the architect and builder intended it to have. There are hundreds of such buildings, some of which have bent down under the weight of their own top hamper, some owing to faulty materials, and a larger class to the giving way of weak foundations. The leaning tower of Pisa is not the only example of the "slantingdicular" style of architecture; it has representatives in every capital, from the stately Parthenon to the ugly little dissenting chapel at Little Peddlington. Such deviations from the vertical may be great or small, and they are sometimes so small that they cannot be readily detected, nor can it be ascertained, without much calculation and the help of a theodolite and scaffolding, how far the error extends. There are few architects or builders who care to go to much expense to show that the stones which they have put together are wanting in verticality. It is like expecting a man to buy a guillotine with which to operate upon his own unfortunate neck; but when both architect and builder have long returned to the dust—dust which is possibly a component part of mortar for newer erections—it often becomes necessary, as a matter of precaution, to find out whether a building is straight or leaning. Mr. Mallock's process for doing this with the camera is really a new application of photography, upon which he may be congratulated. He uses a quarter-plate camera, and it is placed on a base-board, having room in front for a small tray or tank filled with glycerine and water. This gives him an artificial horizon, and in this miniature sea every line of a building which it is desired to test is reflected. In a negative so obtained it is easy to ascertain if his verticals are right or wrong; but first a datum line must be obtained, from which measurements can be made by means of a micrometer. This is provided by a single fibre of natural silk, just as it comes from the cocoon, which is stretched across the plate and fastened with wax at each end. The rest of the operation is a simple question of exact measurement. Mr. Malloch showed a number of interesting examples, and also explained how errors due to aberrations of the lens, inequality of the glass plate, &c., could be detected and remedied. This new method of conducting by simple means an operation which used to be both tedious and costly is likely to have many applications.

Croydon Camera Club.—The meeting on Wednesday, April 8, was devoted to the consideration of

HALATION IN DRY PLATES, AND ITS CURE.

The PRESIDENT, in introducing the lecturer, stated that halation is very much more often present than is suspected; a high speed, *i.e.*, coarse-grained film, produces general veiling of the shadows through the granular particles radiating light on to the back of the glass, which becomes reflected and strikes in varying degrees all over the back of the film. Mr. J. T. SANDELL then read his paper, which dealt with both halation and latitude, in the course of which he explained with much clearness—not to say special knowledge—the variations in chemical and physical properties which different emulsions are liable to, and how these variations made fast plates more subject to halation than are slow ones. But the most rapid plate possible will always be the favourite, hence some means of counteracting the extreme tendency to halation in such plates is called for. Mr. Sandell reviewed and criticised various remedies, as the sienna and caramel backing, the potassic permanganate substratum, the ammonium picrate staining of the film, and then proceeded to explain his own invention, namely, the multiple-coated plate. In these two or three sensitive emulsions are superimposed. The top one is of the highest possible speed, the lower ones are of ordinary slow speed. It hence follows that, whilst the top film will register an image with very short exposure, the fine grain and opacity to actinic light of the lower film prevents light radiated from the coarse-grained top film from falling on the back of the gloss and producing the defect known as halation. Mr. Sandell also explained how his device ensured a much larger amount of latitude as regards error in exposure, and referred to two prints of negatives shown, in which, while one of the latter had an exposure of one minute, the other was exposed for fourteen hours. Mr. Sandell subsequently developed three plates which he had exposed for two, four, and six minutes respectively, using a weak metol solution; the

above were successfully developed. Using a diluted developer as aforesaid, the time is about twice or thrice that usual for completion of negative, twenty to thirty minutes being the normal time needful with the developer recommended.

Hackney Photographic Society.—April 7, Mr. W. A. Hensler presiding.—Excursion matters were discussed. It was announced that the first outing for the especial benefit of beginners would take place on Saturday, the 18th inst. Party to meet at Snaresbrook for River Roding, by the first train after 2 p.m.

South London Photographic Society.—April 8, Annual Meeting, the President (Mr. F. W. Edwards) in the chair. Twelve new members were elected, and six more nominated. The HON. SECRETARY presented his report, showing that the Society had maintained its position, and that a considerable number of interesting and instructive papers had been read at the bimonthly meetings during the year. The Seventh Annual Exhibition had been held, and was very successful. The number of foreign competitors was more than double that on former occasions, and one of the Judges' awards was to an American competitor. The excursions had been better attended, and two three days' outings had been carried out, when a large number of members were present. There had been a good number of hirings of the camera sets (12×10 and whole-plate), and also the club lantern. Some useful additions to the library had been made, and two original enlargements (*Ginx's Baby* and *Happy Days*), and also two original prints by the late O. G. Rejlander had been presented to the Society. The election of officers resulted as follows:—*President:* Mr. F. W. Edwards, F.R.P.S.—*Vice-Presidents:* Messrs. S. W. Gardner, Maurice Howell, W. Rice, F.E.I.S., W. F. Slater, Dr. T. G. Munyard.—*Committee:* Messrs. M. Boxall, W. C. Boyce, C. F. Dickinson, H. Esler, A. Fellows, F. W. Grigg, B. Lyon, G. A. Maull, W. D. Welford.—*Curator:* Mr. G. H. Moss.—*Hon. Lanternist:* Mr. J. T. French.—*Hon. Treasurer:* Mr. A. E. Whitby.—*Hon. Secretary:* Mr. Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.—*Hon. Assistant and Excursion Secretary:* Mr. A. E. Allen, 27, Princes-square, Kennington, S.E.—*Delegates to the Affiliation of Photographic Societies:* Messrs. Charles H. Oakden and W. D. Welford.

Tooting Camera Club.—April 7.—M. LUBOSHEZ, of the Eastman's Photographic Materials Company, Limited, delivered a lecture upon

THE MANIPULATION OF BROMIDE PAPERS.

The lecturer also treated the audience to some very lucid ideas upon the subject of lighting in portraiture. At the finish, several members owned to the articles of their photographic creed being severely shaken, especially regarding the effects of bromide salts in development, and the permanency of bromide prints toned to an artistic brown by M. Luboshez' method, the effect of which is undoubtedly obtained by sulphur toning.

Aintree Photographic Society.—April 10.—The room was well filled by friends and visitors, who responded to the invitation of hearing a lecture on

GLASGOW AND THE VALE OF CLYDE,

illustrated by about 180 slides, kindly lent by the Glasgow and West of Scotland Photographic Association. The Vice-President, Mr. W. B. Hellon, undertook the descriptive part. Many of the slides called forth loud praise. A series of outings have been arranged for the summer months, the first to take place on Saturday afternoon, April 18, to Thornton, Crosby, Crosby Hall and Park (by permission of Colonel Blundell), Ince, Blundell, and Sefton.

Liverpool Amateur Photographic Association.—April 9.—Mr. PAUL LANGE gave a demonstration of the production of

ENLARGED NEGATIVES

from smaller-sized plates, and exhibited about a dozen fine examples of his skill in this direction, the enlargements being 15×12 inches, mostly from 5×4 inches hand-camera shots, and gave minute details of his method of procedure. Te lecture was listened to with interest by a good number of members, and it is hoped many will take advantage of the means placed at their disposal to produce a good show of pictures at the next annual competition.

Moseley and District Photographic Society.—April 10, Captain Davidson in the chair.—Mr. WALTER GRIFFITHS gave a paper, entitled

MISCELLANEOUS.

The lecturer suggested the title would cover anything he would have to say or could be said, so he plunged then into the mysteries of plate-making as a first subject. He set a piece of gelatine to soak in H_2O. Having dissolved some potassium bromide in hot water and some silver nitrate, the bromide solution was added to the gelatine, which, being reheated, the gelatine dissolved. The silver nitrate was then added slowly, when the matter immediately assumed a milky appearance, and, of course, was sensitive to light. From the adding of the silver nitrate downwards, the emulsion must be made in the dark or red room, although the lecturer did it in gaslight to show the members more plainly, so the emulsion would be useless. The lecturer did no more now, but explained how the emulsion should be washed and boiled, and the plate should be coated, levelled, and dried, when they would be in a fit state for exposure. Then you have a dry plate, good or bad, according to the emulsifying and the absence of fog, &c. The lecturer then took his audience through the mysteries of isochromatism, explaining how the difference between the visual and actinic differences of the spectrum were more evenly balanced. He then called attention to lenses, showing the crown and flint glasses of uncemented lenses; how they fitted together perfectly, and the exactness of the curvatures (the lenses were of his own manufacture). He went on to explain the action of long and short-focus lenses, advising a long-focus lens, as giving more pleasing perspective, and warning against short-focus when possible, as giving strained perspective. Having explained the rising front, swing back and front, the lecture came to a close.

Dundee and East of Scotland Photographic Association.—The seventh monthly meeting of the Dundee and East of Scotland Photographic Association for the session 1895-6 was held in Lamb's Hotel, Dundee, on Thursday, the 9th inst., Mr. A. Stewart in the chair. Three new members, nominated at last meeting, were admitted, and five additional names were submitted for consideration a month hence. It was explained that the lease of the old Chess Club-rooms as the rooms of the Association was now prepared, and only awaited signature. Mr. W. H. TITTENSOR gave a demonstration of platinotype development, including the cold-bath process, and showing also a development with glycerine and a brush. This paper appears on page 248.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

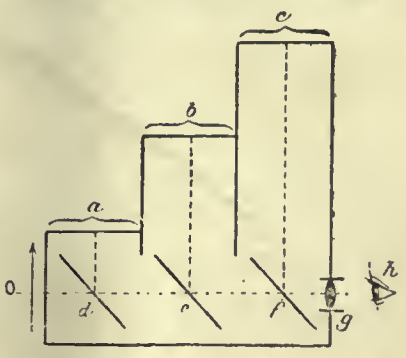
PHOTO-CHROMOSCOPES.

To the EDITORS.

GENTLEMEN,—Without in any way wishing to reopen the discussion on this subject closed by you in your last issue, will you allow me to point out that Mr. Ives has omitted from his notes all mention of Zink's photo-poly-chromoscope, a diagram of which was published by you in your issue for July 26, 1895, as an illustration to my paper before last year's Convention.

The following passage from *Die Darstellung der Natürlichen Farben durch Photographie*, by Hermann Krone, fixes the date of its construction, and this will be interesting in future and complete Mr. Ives's useful notes:—

"In the early part of 1893 Carl Zink, photographer of Gotha, without knowing anything of Ives's photo- or helio-chromoscope, constructed an apparatus which can be used for the same purpose as the latter, which he called the photopoly-chromoscope, and which, on account of the great simplicity of its arrangement with greater lightness, appears to be able to



accomplish the same as Ives's apparatus. In the Exhibition of the twenty-third Convention of the Deutschen Photographenvereins in Frankfurt a/M., in August 1894, Zink publicly showed the first specimen of this, his photopoly-chromoscope, and, after it had been tested, a silver medal was awarded to it by the jury of the Convention."

The photo-chromoscope of Ives here referred to is the old form, U. S. Patent, No. 475,084, May 17, 1892, which, of course, antedates Zink's machine.—I am, yours, &c.

E. J. WALL.

ASSISTANTS AND THEIR GRIEVANCES.

To the EDITORS.

GENTLEMEN,—You published in your issue of April 3 a very able article, giving some good advice to assistants seeking employment.

I sincerely hope it will be of some service to the many assistants now out of employment.

Cannot some competent writers on the staff of the JOURNAL take up the brief on behalf of the poor sweated assistant? I am sure, from the letters which have appeared in the JOURNAL during the last twelve months, their grievances need remedying, and well deserve serious attention. Take the sweating which goes on in one large firm of cheap photographers. On Good Friday and all Bank Holidays operators slave away from nine till five, with no time for meals, taking from sixty to seventy sitters; then, I am told, have to stop to do the developing, or be bullied. I am aware the firm is well known to London assistants, and is boycotted by them. The result is, this firm are always changing (assistants either give notice or take French leave)—are compelled to rely on assistants "green" from the country. I am sure if a member of your staff could interview the hands employed by this firm he would be able to publish some painful revelations as to the treatment of the assistants. They are, I am told, afraid to write to the JOURNAL in case of being "spotted," and so they work year in and year out, having to put up with this harsh treatment. So bad is the treatment becoming, it is nothing, so I am told, for assistants to go out to tea and not return any more.

Obviously it is necessary something more should be heard on the subject.

I was hoping to see an article in this week's JOURNAL on the assistants' grievances.

I think the time has arrived when something should be done to redress their grievances.

Is it too much to ask Mr. Randall to try another shot at forming an Assistants' Union, and thus bring these sweating firms to book.—I am, yours, &c., A North Wales Operator.

[We are always happy to throw open our columns to operators and assistants who may desire to discuss their position and prospects, with the view of improving them, and a perusal of our pages for years past will show that we have never neglected an opportunity of endeavouring to help them in their legitimate aspirations and grievances. We ask, as we have many times asked before, why do not photographic operators, assistants, and *employés* generally combine to form a union for mutual support and assistance?—Eds.]

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

To the Editors.

Gentlemen,—It may be a matter of interest to some of your readers to know that instruction meetings are held monthly by the above Society, when elementary photographic subjects are treated in a manner specially adapted to the requirements of beginners and junior workers.

Gentlemen taking up the study of photography are always welcome to attend, and I shall be pleased to render information to inquirers.—I am, yours, &c., W. Taylor, *Hon. Sec.*

38, *Palace-road, Hornsey, N., April* 3, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

Received:—Marion & Co.; Edgar Scamell; "Elphin;" H. A. Aylward; T. J. Evans. These, and others received too late, in our next.

Cut P.O.P.—P. and D. Thanks for your letter.

Address.—E. G. We are unable to supply the address desired. We do not find the name of the firm in any of the foreign journals we have.

Spurge's Sensitometer.—C. S. says: "I should be much obliged if you could inform me where I can procure Spurge's sensitometer."—Write Mr. J. B. Spurge, care of Mr. Clarkson, Bartlett's-buildings, Holborn.

Developer.—Anxious. Some workers prefer pyro ammonia, and others pyro soda. With some brands of plates the one developer is said to give better results than the other. It is, however, much a matter of opinion. Both are good.

Out of Focus.—C. Walkden. If the lens gives perfectly sharp negatives with one camera and not with the other, it is pretty clear that the focussing screen and dark slides of the latter are not in accurate register. The remedy is obvious.

Enlarging.—S. W. Carbon tissue is too slow for enlarging upon direct, even if the limelight with a mixed jet be employed. With a powerful electric light under favourable conditions, enlargements can be made direct, but the exposure is then long.

Reversed Negatives.—T. Leach. The most general way of taking reversed negatives is by using either a prism or a mirror. Some, we know, take them through the glass; that is, instead of putting the plate in the camera film side next the lens, the glass side occupies that position. The disadvantage of this method is that any scratches on the back of the glass, or air bubbles in it, are reproduced in the negative.

Patenting an Invention.—Patent. 1. Write to the Comptroller of the Patent Office, Southampton-buildings, London, W.C., and you will obtain the necessary form to fill up. 2. A drawing will suffice. 3. Provisional protection will cost you 1*l.*, and will last for nine months. As you appear to have very little experience of such matters, we should recommend you to place yourself in the hands of a respectable patent agent.

Addresses of Exhibitors Wanted.—M. Lavington. We believe that a later edition of the book you name has been published. Failing that, a copy of our Almanac will give you the names of the manufacturing firms, and the section devoted to photographic societies supplies a ready means for the distribution of your circulars, which would reach exhibitors through the medium of the secretaries of their societies.

Nitrate of Silver.—The green colour of the crystals is due to the presence of copper. That is always the case when the nitrate is made from old silver plate, unless means are taken to get rid of the copper. You would have found it more economical to have sold the silver to the refiner than to have converted it into the nitrate. You can now only sell the salt to the refiner, as no one would purchase it for photographic purposes.

Right to Photograph.—Visitor. Although the owner has a perfect right to make a charge for permission to photograph the ruins when taken from within the grounds, he has no such right when they are photographed from the public roadway. The caretaker exceeded his rights in attempting to prevent you from taking the picture from the outside. We are glad you persisted in the face of the threatened summons, which was mere "bluff."

Head Rests.—Davis & Sons ask: "Can you inform us the address of the successor to the business of the late Mr. Emmerson, of Briggate, Leeds, who was a maker of a specially light head rest?"—In reply: Our correspondents probably allude to Mr. G. Day, 11, Edward-street, Lady-lane, Leeds.

Agreement.—R. W. H. If the three years' agreement expires on May 1, you can leave without giving your employer any notice at all, unless there is a clause in it that notice is to be given. It will, however, be more courteous to tell your employer of your intention, particularly as he has an impression you will remain in his service.

Residues.—H. Casey. It is no use whatever saving the old developer from dry plates, or that from bromide paper, as neither of them contains silver. The old fixing solutions are worth saving, but they will contain much less silver than you used to get from the albumenised paper which you sensitised yourself. Nothing is better than the sulphide of potassium for throwing down the silver.

Studio.—R. Will's. You will not improve on the design. If, however, you can get it two or three feet longer, you will find it more convenient at times in working. Decidedly, have iron sash bars in preference to wooden ones, as the studio will be a brick building. By all means submit the plans to the Council's surveyor before commencing to build, not that we think that there will be any objection to the structure, but it may avoid any after-quibbling.

Toning Collodio-chloride Prints.—G. P. writes: "Would you be so kind as to tell me Paget's formula for toning collodio-chloride prints, as I don't know it? I always prepare my own paper, as I have done for many years, and toned it with the sulphocyanide bath, but I can't get the right tone for matt paper."—In reply: See this Journal for September 13, where very full working instructions are given. The toning formula is simply: Ammonium sulphocyanide, 30 grains; gold chloride, 2 grains; water, 16 ounces.

Blisters.—Amateur in Trouble writes: "I have to-day, for the first time, used the sensitised paper, and I find it blisters very much. I first washed the prints in several changes of water, then toned in carbonate of soda, 10 grains; gold, 1 grain; water, not distilled, 10 ounces; then washed in two changes of water; then I put them into a fixing bath of hypo, same strength as for plates, five parts to one; then washed in two changes of water, when the blistering came, but only two out of the four. What is the reason, do you think? Why are not the other two blistered? Was it because I left them for a while to soak after fixing, or was the fixing bath too strong? If you could help me in this, I would be much obliged."—Some papers are more prone to blistering than others. There is nothing in the formula used to cause it, presuming that in the fixing bath our correspondent means one part of hyposulphite of soda to five of water. Blistering may be avoided, with blistering paper, by immersing the prints, before they are washed for toning, in methylated spirit for a few minutes, then washing and toning as usual.

Renovating Silver Bath.—Henry Ryan writes: "I should be glad if you would tell me the easiest, at the same time the best, method of making new silver baths from old ones. I generally dilute to twice its bulk, filter, and boil down till all the nitrate is fused, then make up to strength again, neutralise, and sun for some time. I use a fairly good-sized bath—about 160 ounces; but, after working about forty 8½ × 6½ size plates, it gets over-iodised, and I have to keep always boiling it down. Would the addition of barium nitrate do any good, or is there anything else you could recommend? Last week a piece of putty somehow got into a bath, and has discoloured it very much. Filtering is not of any use. Would you kindly tell me how to eliminate it?"—Putty is certainly not a good addition to the silver bath for wet collodion, and it may have quite ruined it. Our correspondent seems to have begun at the wrong end at renovating the bath. It should first be diluted, then neutralised, and afterwards sunned, filtered, and then boiled down and fused. The silver, then dissolved, will make a new bath, which may or may not require acidifying. This treatment will, doubtless, restore the "putty" bath.

Stereoscopy, Radiography, &c.—Photophil writes: "You are so generous to your cloud of interrogators that I am tempted again to seek your aid, "Bis dat qui cito dat," though I feel I am almost abusing your indulgence. However, it will probably cost your serene encyclopædicity little to reply to one or more of the ensuing queries: 1. In what place in Europe should I get most cheaply a quantity of the coloured spectacles required for viewing stereoscopic projections made? 2. In what place, also in Europe, should I get a quantity of fairly effective prism glasses for the ordinary stereoscope? In 1 and 2, cheapness would be a *a sine-qua-non.* A job lot might suit. 3. Röntgentype. I should be glad of an impartial (not commercial) approximate estimate of the cost and weight of such electric apparatus as is necessary in order to obtain with ordinary photographic appliances effective Röntgentypes such as would be useful in surgery. I. (*a*) Is a coil necessary? (*b*) Is an accumulator necessary? (*c*) Is a battery necessary in absence of machine electricity? or (*d*) Would a plate machine do, and of what diameter? II. Cannot the coil, the battery, and the plate machine be home-manufactured, leaving only the Crookes' tube to be bought? Price is not so much the difficulty as importation expenses and difficulties. III. Is there a pamphlet as to the *modus operandi* in detail? 4. Was there not given in a back number a cutting board for dividing any plate in halves?"—In reply: 1. Messrs. Newton & Co., Fleet-street, supply such spectacles. 2. Probably Messrs. Sharland, Thavies Inn, Messrs. A. E. Staley & Co., 35, Bucklesbury, or Messrs. Clement & Gilmer, Rue de Malte, Paris, would be able to help you. 3. Roughly speaking, an outlay of about 22*l.* would, so far, be necessary. The essentials are coil, battery, and vacuum tube. See article (page 134), which answers your other questions. 4. Have no recollection of it.

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EX CATHEDRÂ.

The arrangements for the Leeds meeting of the Photographic Convention, which opens on Monday, July 13 next, are now nearly completed. Mr. Drage, the Hon. Secretary, informs us that the Reception Committee, comprising seventy of the leading residents in the district, headed by the Marquis of Ripon, K.G., have expressed great interest in the forthcoming gathering, and the Executive Committee, presided over by Mr. J. H. Walker, Mr. Herbert Dennison acting as Treasurer, and Mr. Godfrey Bingley, of Thorniehurst, Headingley, Leeds, acting as Local Hon. Secretary, will spare no pains to make the Leeds Convention thoroughly successful. The Mayor of Leeds, the Right Hon. W. L. Jackson, M.P., will receive the members of Convention, in the City Art Gallery, on Monday evening, July 13, at half-past seven.

* * *

Important papers will be read and discussed, and demonstrations of great interest and utility to all photographers will probably be given in the evening throughout the week, for which the commodious rooms of the Leeds Philosophical Society have been engaged, the central position and conveniences of which will be greatly appreciated by all Conventioners. The Excursion arrangements are eminently satisfactory, and the districts surrounding Leeds are perhaps unsurpassed for general interest and picturesqueness. A prominent feature of this year's Convention, and likely to prove a very great attraction, will be an exhibition of a hundred modern pictorial photographs, kindly got together and arranged by the President, Mr. H. P. Robinson, comprising pictures by the leading exhibitors of the last few years. There will be also an exhibition of the newest forms of apparatus in use for photography, and of photographic material and processes by some of the leading trade exhibitors of this country. Everything, therefore, promises well for a successful meeting, and we trust that the efforts of the Executive will be be rewarded by a very large attendance.

* * *

A photograph of lightning, characterised by an unusual feature, has been submitted to us by Mr. W. J. Bishop, who took the negative. The flash presents the usual ribbon-like appearance, but, instead of being, as are most, if not all, such photographs, simply a clear bright line on a dark ground, the flash has both detail and half-tone, imparting to it the effect of being modelled. The suggestion is that what may be regarded as the equivalent of a time exposure was given, hence the detail. The negative, which clearly indicates the phenomena mentioned, well bears enlargement, and the result appears to us so uncommon as to deserve mention.

* * *

A few weeks back we took occasion to congratulate Mr. Thomas Keig, photographer, of Douglas, Isle of Man, on his elevation to the position of first Mayor of that town. We are sorry now to have to record that Mr. Keig did not long live to enjoy his dignified position. He died last week from the effects of cancerous complaints, which resulted in congestion. Mr. Keig was sixty-seven years old.

* * *

We have received the May number of a light and amusing periodical, called *In Town*, the editor of which draws our attention to the fact that, among its many illustrations, not a single photograph is to be found. There are distinct signs in the illustrated press of a reaction against the use of photographs, the objections to which are so well summarised by our ably con-

ducted contemporary, the *Publishers' Circular*, in its last number, that we reproduce some of its remarks on the subject.

* * *

"THERE still remains something to be said on the subject of art and photography in connexion with newspaper and magazine illustrations. To place any ordinary, inartistic photographer in the place of a trained artist, substituting for the imaginative and picturesque the commonplace, unpicturesque, mechanically made photograph, is to degrade the art of illustrating to its lowest level. It is utterly impossible, for instance, with the assistance of ordinary models, to pose living figures satisfactorily in the representation of incidents requiring the expression of passion or the more impressive actions and impulses dealt with in a tale or novel. Yet this practice is becoming more and more common in the illustrating of our magazines and periodicals, as well as books.

* * *

"ARTISTS are frequently, however, largely to blame for the innovation; they themselves so often give us mere portraits of models, as wanting in feeling, expression, and action, as if they were produced by the camera, that editors and publishers think it folly to pay as many guineas for drawings as they would pay shillings for photographs. There are now before the writer some childishly ridiculous specimens of these story photographs, or photograms, as they should really be called. In one the figures are arranged with considerable effect, but they are associated with painted accessories no better than the worst we have seen in a penny stage booth at a country fair. On the other hand, we see no reason why photographic views, landscapes generally, and architectural subjects, street scenes and news incidents of actual occurrence, taken on the spot, together with similar subjects, should not come well within the province of the illustrating photographer. But even here special training and knowledge are required."

* * *

"THE photographers employed on work of this kind should have some practical experience of printing technique, as well as a fair share of artistic taste and feeling—rare faculties, yet many of the wood and copper-engravers possessed them, and more. In a landscape the prevailing sentiment should be caught as well as the actual forms, and this never can be if the operator regards his subject with no more thought or feeling than his lens has. We want, in short, a new class of photographers for such work—operators who not only know the best kind of negative necessary for the production of a photogram block, but the kind of process block which will enable the printer of a paper or magazine to show his most successful work."

* * *

OUR contemporary is conspicuously impartial in its strictures, for it will be observed that, besides the photographers, the artists come in for their share of criticism. The remarks of the *Publishers' Circular* amount virtually to a plea for the combination in one individuality of the artist and the photographer, a desideratum partly met by the growing practices of subjecting process blocks to hand work, and of "preparing" photographs for reproduction. But there is much comfort in the reflection that the spread of pictorial photography through all classes of camera-workers is not insensibly helping forward the movement our contemporary has at heart.

HALATION.

IT was very truly remarked, in the course of the discussion on halation at the Photographic Club a fortnight ago, that this defect in negatives is not due to any one particular cause, but to an aggregation of causes. In spite of this, however, the tendency undoubtedly exists to seek for remedies which shall be universally applicable, and, while the inventor or promoter of any particular plan upholds its infallibility because it answers under one set of conditions, others may totally condemn it because it is useless under entirely different circumstances.

Then, again, it is too commonly the practice to regard all kinds of photographic films as the same in character, and to attempt to apply to each alike the same remedies, whereas, as a matter of fact, almost every kind of film is subject to a different form of the disease, and, consequently, requires an entirely different remedy. Roughly compare, for instance, the effects produced respectively upon thin and transparent, and dense, and comparatively opaque films; if the former, which represent the older dry-collodion films, were subject to halation, how much more so are the thick, almost opaque, gelatine films of to-day. And yet it is expected that the same remedies will answer in both cases, and, in fact, it is assumed that the defect is similar in character in both. How far this is from being the case, a little consideration of the facts will prove.

If the reflection from the back theory were the correct and only explanation of the trouble, then we should certainly find that thin films were hopelessly subject to halation, while the thicker gelatine films were comparatively, if not wholly, free from it; but, as a matter of fact, the very reverse is the case, and, even without going to the extent of comparing collodion and gelatine, it is a well-known fact to old dry-plate workers that some of the denser and least translucent of collodion dry plates were far more liable to halation, or "blurring," as it used to be termed, than others which were absolutely transparent. For instance, the old Hill-Norris plates of three decades ago, which were so clear and transparent that to the modern dry-plate man it would seem impossible to get any result on them at all, were almost entirely free, even under the most aggravated circumstances, from any tendency to halation, while the thick, creamy films of Major Russell's bromised collodion process were peculiarly liable to the defect, although they more nearly approached in character the gelatino-bromide plate.

At the same time it must not be supposed, because a film which is transparent enough to allow the image formed by the lens to pass through it and suffer reflection is not affected by halation, that, therefore, the theory of back reflection fails, nor, in the case of a thicker film that does show halation, that the effect may not be at least partly due to reflected light attacking the under side of the film. The fact is that, while this influence of back reflection is always more or less present, it requires other conditions to work in with it and bring it into prominence. In the case of the transparent collodion film, for instance, it is its very transparency which allows the light to pass freely through it without being arrested, combined with the comparative insensitiveness, that ensures its immunity when such is found to be the condition of affairs; and it is the denser character of the gelatine film which causes it to stop and break up the light rays in their passage, together with its far greater sensitiveness, which renders it infinitely more susceptible to the action of very feeble diffused and reflected light, that the almost opaque modern dry plate owes its peculiar proneness to a defect from which it might be expected to be absolutely free.

It is impossible within the limits of one article to touch upon the different varieties in which the defect of halation is met with, or even to dwell at any great length upon the different forms in which it is met with in collodion and gelatine films respectively. The three chief causes may be set down as: (1) reflection from the back, (2) internal irradiation or reflection from the particles composing the film, and (3) solarisation or excessive action of the light. The two last are indirectly, or it may be directly, affected by the first, which, if not the sole, may therefore be considered as the most important, element to be considered, for, given a certain amount of action from either of the two latter causes, it must obviously be intensified by any additional action of reflected light.

Any method, therefore, which prevents or reduces the reflection from the back of a glass plate must tend to lessen the liability to halation in any form or from whatever cause due. But what are we to say of the reverse method, mentioned at the meeting above referred to as well as at the London and Provincial Association, in which the back surface of the glass plate is converted into a reflecting, instead of an absorbing, one, by silvering? So far as we remember, this idea was first mooted as far back as 1874 by Canon Beechey, the idea being, that, by sending back the transmitted rays in direct lines to act upon the back of the film, the effect was to shorten the exposure without producing any blurring of the original image. But in this calculation the effect of refraction was entirely overlooked; by this influence, and in proportion to the thickness of the glass plate and the distance from the axis of the lens, the image would be doubled, simply because the reflected rays would strike the back of the film in a different place from where they passed through. Under ordinary conditions, such as foliage cutting against a bright sky, or the fine tracery of a window in an interior, the effect would simply be ordinary halation intensified, since the mass of light reflected would obliterate the foliage or tracery. But, if the conditions be reversed, and a number of fine slits in an opaque screen be photographed upon a silvered-glass plate, it will be found that a sharp double image of each slit will be produced, and that, in proportion as the distance from the centre of the plate or the axis of the lens is increased, so will the distance between the two images become greater.

We have before us, as we write, a photograph of a window sash, looking out into a clear sky, taken upon thin silver mirror glass by means of collodion. It is perfectly clear and free from halation, because the exposure was not long enough to cause any tendency in that direction, but it affords an instructive commentary on the value of silvered glass for the prevention of the defect in question. Standing in front of a light, if the plate be examined at an acute angle, it will be found that the direct and reflected images can be made to so overlap that the sash bars are entirely obliterated. Where, then, the utility as a preventive?

PHOTOGRAPHIC SOCIETIES: PAST, PRESENT, AND FUTURE.

THERE are now, in the United Kingdom, something like three hundred photographic societies, and, as others are continually being formed, one cannot help speculating as to what will be the position of many of them a few years hence. As we hear of the formation of new ones, so also we hear of the demise of others. Before speculating on the future it will be as well to look back on the past, and contrast that with the present state of societies. The Royal Photographic Society was established, in 1853, as "The Photographic Society." Soon afterwards other societies were formed in different parts of the Kingdom. Reference to the journals of that early period shows that, as a rule, the meetings were well attended, and the matters brought before them were principally those of a technical character, and original research, for which, as photography was quite in it infancy, there was ample scope. This made the meetings of considerable interest.

Photographers then had to prepare the greater part of the material they used for themselves. There was, of course, no ready-sensitised paper; the user had to sensitise, and at one time even to albumenise, it himself. There were no commercial dry plates; hence the worker had, perforce, to make them by one or other of the bath, or collodion emulsion processes, and their modifications, as then in vogue. Papers, and demonstrations, on the various methods of working were always looked forward to with interest, and the meetings were well attended. It will, however, be noted, when consulting the reports of meetings as given in the journals—say twenty years back—that the interest in the meetings was then flagging somewhat. But, when gelatine photography was introduced, it got a wonderful fillip, and to it must be credited the extraordinary number of societies now in existence. At the time referred to, the chief theme at the meetings was the preparation of gelatine plates, the composition of the emulsion, the method of mixing, cooking, washing, drying, &c. All these formed fruitful topics for investigation and discussion, and much valuable information was brought before the meeting.

After a time, as might be expected, there remained but little original matter to communicate. The manufacture of plates became a settled trade, and few afterwards thought of making their own. Ready-sensitised albumen papers and gelatine, both bromide and chloride, came into the market, hence everything was supplied ready to use, and little interest is now taken by the majority of users in the technics of their production. That is the existing state of affairs.

When a paper is now read, or a demonstration given, it is generally on a method of using some commercial material. It is seldom now that anything like original research in the technics of photography, as in former times, is brought forward, or at least in any of the minor societies. Pabulum for the meetings, is however, frequently provided by manufacturers and dealers by the exhibition of, or demonstration of the use of, their wares, of course for advertising purposes. Many of the meetings are taken up by lectures on a particular district, illustrated by the lantern. But these can scarcely be considered as photographic meetings, as photography is only used as an adjunct to a lecture on, perhaps, architecture or, maybe, archæology, or, indeed, anything else. However, many interesting and entertaining evenings are thus filled up, but, as we have said before, they are really not photographic. The majority of these societies are healthy enough at present, but will they continue to be so in the future—that is, as photographic societies?

Already we have heard of the demise of several societies, and, if one can form an opinion from the annual reports and balance-sheets of some others, they are by no means in a very flourishing condition. The financial state of any photographic society must not, however, be taken as a criterion of its healthiness or otherwise. It is from the attendance of its members, and the subjects brought before its meetings, that an opinion can be

formed. As an illustration of this, we might mention that the old North London Photographic Association, many years ago, died of sheer inanition, while it had nearly 120 paid-up members, at half-a-guinea yearly subscription.

One thing is very certain, namely, that at the present time there are an unnecessary number of societies. By this we mean they are located too thickly. In some districts there are several where one only would suffice. One strong society is worth half a dozen weak ones. Subject-matter for one society may be forthcoming, but not for several. Those who have novelties to bring forward do not care to do so before small societies, and, for that simple reason, an entire district may not see them at all, though, if there were but one society, the case would be different. This is a subject that many societies would do well to take into consideration while they are yet in a healthy condition, and not defer it till they get into a more or less moribund state as some appear to be drifting into.

The Quickest Röntgen Sciographs yet Made.—These have, according to the *New York Electrical World*, been made by means of a new form of tube devised by Professor Woodward, of Harvard University. His induced currents were of 50,000 volts, and the exposures he needed were only five seconds for a hand. His new tube is made almost entirely of aluminium, in the form of a cone, strengthened against collapse from external pressure by the presence of a circular wood disc. The cathode pole is in the form of a platinum disc placed towards the base of the cone a little to one side of the centre, and its plane surface parallel to the side of the cone. It is anticipated that, with a still further increase of the voltage, instantaneous sciographs will be produced, and that it will be easy to obtain the whole of the human skeleton.

Combustion of Acetylene.—At a meeting of the Paris Academy of Sciences, on 13th inst., M. Gréhan gave some useful details upon this subject. He found the combustion in a "Manchester burner," gave a most brilliant flame, and the products of combustion did not contain any trace of unburnt gas. He gives a note of warning against the accidental admission of atmospheric air into the gas-holder, for a mixture in certain proportions is a dangerous explosive. We must, however, point out that other experimenters have advised the addition of a certain proportion of oxygen to increase the luminosity, and diminish the chance of smoky flames But this addition, made of set purpose, would naturally be safeguarded by proper precautions being taken that the due proportion should be observed. The exact ratio of air to gas which is found to be most explosive is nine volumes of the former to one of the latter.

Novel Iodine Test.—If it be desired, for example, to test for the presence of iodide of silver in a dry plate, M. G. Denigé's new method would be to dissolve the silver salts and precipitate the metal from the solution by the addition of sulphuretted hydrogen, and examine the filtrate. The latter is acidified with hydrochloric acid, boiled to expel the gas, and then supersaturated with ammonia. To the solution thus obtained is added a little caustic soda solution and a few drops of mercuric chloride solution, the whole being well shaken up. If a precipitate of a more or less deep red be observed, the presence of iodine is indicated. When no iodine is present, the deposit is white or yellowish white. It is possible to prepare a ready-made test by mixing 1 c. c. ammonia, ½ c. c. soda lye, and a few drops of solution of corrosive sublimate. Iodine in such a solution as above is indicated by the appearance of the characteristic precipitate of mercuri-ammonium iodide, mercuric oxide. It is, in fact, a fresh application of the Nessler test.

Mr. Herbert Jackson's Researches.—It is singular that an English investigator should have been working for many months previous to Röntgen's discovery without making the same generalisation as the latter. His work was with the phenomena of phosphorescence by means of the radiations from a Crookes' tube, the various substances being experimented upon both inside the tube and outside in the more familiar manner. It was during the course of his investigations that he devised a now well-known form of tube termed a focus tube. This consists of a globular tube, of which the cathode is constructed of a piece of aluminium, concave in form, the centre of curvature being sensibly in the centre of the tube. He finds the cathode rays are emitted from this concave surface in the form of a cone, whose apex lies at the centre of curvature. At this centre is placed a small platinum plane at an angle of 90° with the axis of the cone, and the Röngen rays emanate therefrom governed by certain peculiar conditions. If the tube be fairly well exhausted, the Röntgen rays appear to radiate in a cone from this centre, but, as greater exhaustion is given to the tube, this cone narrows till it becomes apparently a straight line, when the exhaustion necessary for the production of the highest phosphorescence outside the tube is attained.

The Best Phosphorescent Surface.—Mr. Jackson has tried a very large number of substances, but finds platinocyanide of potassium to be the best. This salt crystallises with three molecules of water, and should be used in its hydrated condition. As it is subject to efflorescence, special methods have to be made use of either to keep it moist or to supply moisture when required. This is rather a drawback to the employment of such a screen in actual contact with the film of a plate for increasing the photographic power of the radiations, as some reactions inimical to the production of a clean negative might be brought about.

A CORRESPONDENT, writing to *Nature*, describes another material for a luminous screen which, while not equal to a platinocyanide, is still very useful and capable of materially reducing the exposure needed. It is, moreover, a cheap substance, and compares vastly favourably with platinocyanides at sixty or seventy shillings an ounce. The substance in question is scheelite, a native tungstate of calcium, which possibly may prove to be the particular salt with which Edison's name has recently been connected. The experimenter in question powdered the material, and coated a piece of black card with it. He obtained a most notable reduction of the exposure.

Anti-halation Plates.—A correspondent senda us a suggestion for the preparation, in an easy and convenient form, of films that shall be free from all tendency to halation, and which, he considers, would be more effective in use, and more perfectly freed from any colouration in the shadows after development, than others at present employed. Briefly, the method consists in first coating the glass plate with a thin emulsion of silver chromate, which, after drying, is recoated with the sensitive emulsion of bromide of silver. The preliminary film, as our correspondent points out, will be of a deep rich red colour, quite impervious to the passage of any rays that may penetrate the bromide film; but this red colour is immediately discharged by a soluble bromide, which converts the chromate into bromide of silver, or by hypo, which dissolves it, and therefore, after development, the anti-halation colour can be as completely got rid of as if it had never been present.

WE are very sorry to put a damper on our correspondent's hopes, but, in the first place, his suggestion is by no means a new one, having been made several years ago by Mr. W. K. Burton, with the very same object in view. But, unfortunately, one or two chemical points are overlooked in the calculation. The first is, that chromate of silver is reduced without exposure to light by alkaline pyro or similar developers, and consequently, unless it was converted before reduction, the negative would be equally blackened all over. A preliminary immersion in a weak solution of bromide of potassium would effect the necessary conversion before the developer was applied, or, probably, an extra dose of bromide in the developer itself would have the the same effect; but, as this would entail the forma-

tion, by double decomposition, of potassium chromate, another influence altogether would be set at work. Potassium bichromate, as is well known, is employed in the process of emulsion-making for the removal of fog, and is recognised as a powerful destroyer of the developable image. What, then, can we imagine the effect to be upon the exposed negative image, on one of these "anti-halation" plates, of the conversion of the underlying film of chromate? Simply, that the image would be destroyed, and development rendered impossible. We repeat, we are really sorry to throw cold water on a very nice-looking process—on paper.

Chromate of Silver as a Medium for Dark-room Windows.—There is another application of chromate of silver of which greater use would be made if only the proper method of working were understood, as the emulsion of silver chromate—which was also first recommended by W. K. Burton at a meeting of the Photographic Club—is very easily made, and is, at the same time, very effective as a light filter. It is necessary, however, for dark-room purposes, to provide adequate protection against chance and flashes of chemicals, which act with very great rapidity upon the gelatino-chromate film, either to reduce or convert the chromate into bromide; but all danger is easily obviated by enclosing the film between two sheets of glass, by which it is securely protected against all chance of accident.

The only objection we have heard raised against chromate of silver films for the purpose under notice is, that they gradually become darker by exposure to light, until, at last, it is impossible to work by the small amount of light transmitted. This was for some time quite contrary to our own experience, and it was only in the course of conversation with one who complained of the gradual darkening that we hit upon an explanation of the apparent anomaly. There are two chromates of silver corresponding in their composition to the corresponding potassium salts, so at least the text-books teach us. If a solution of silver nitrate be added to one of potassium bichromate, a dense red precipitate of silver chromate is formed, and, if this be allowed to subside, the supernatant liquid will be found to exhibit a deep yellow colour, and a similar colour will be imparted to the washing water if the precipitate be treated with repeated changes of that agent, showing that the silver salt is partially, if slightly, soluble. But, if instead of the bichromate the neutral chromate of potash be employed, the precipitate formed will differ slightly in colour, tending more to purple in tint, and will settle down, leaving a colourless, or practically colourless, upper liquid; it may also be washed in repeated changes of water without loss of bulk, or without colouration of the water, showing that it is practically insoluble.

Whether these are really two definite chromates of silver, or whether the apparent solubility of the precipitate formed by bichromate of potash is due merely to the presence of excess of acid in the decomposition, it is impossible to say, but it is quite clear that an emulsion containing the more or less soluble chromate with probably an excess of silver nitrate would be more likely to change, with time and exposure to light, than one in which the chromate was in the insoluble condition. The moral, therefore, is obvious: In forming such an emulsion, employ the neutral chromate of potash, and, while keeping as near to the equivalent proportions of the two salts as possible, avoid an excess of silver nitrate. If these directions be attended to, the result will be a colour filter that, under ordinary conditions, will be practically permanent.

JOTTINGS.

The series of lectures on photography with the chromium salts organized by the Affiliation of Photographic Societies has not, so far as I can gather, filled my favourite room at 12, Hanover-square with overflowing audiences. The lectures look like being more or less of a fizzle, and I take leave to say that there is no room to be surprised thereat. Surely, carbon printing is a subject upon which it would be difficult to say anything new; collotype has been hacked to death; and Woodburytype, beautiful process though it be, is as likely to secure increased adoption as Daguerreotypy is of being revived to-morrow.

Photographic Scraps, a useful little publication, in each number of which one is tolerably sure of lighting upon a serviceable practical hint or two, has, in its April issue, a well-timed word of objection to the excessive and unnecessary degree of speed towards which several modern plate-makers are veering. It seems to me that for practical purposes we do not want plates whose sensitiveness is so great that, to quote poor Traill Taylor's favourite phrase, it has reached the condition of "tottering equilibrium," and therefore renders the avoidance of fog a matter of extreme difficulty. My own recent experiences of some high-speeded plates were that, even under the most carefully judged conditions of exposure, development, and dark-room illumination, they were so unmanageable as to render development an irksome anxiety instead of an intellectual pleasure. With phenomenal speed the fog factor assumes a prominence it does not possess with plates that will stand full exposure and normal development without resenting such treatment.

Time, in its flight, has nearly brought another Convention meeting round, and ere many weeks have passed some hundreds of us, I hope, will have assembled at Leeds under the presidency of Mr. H. P. Robinson. May I ask as many of my professional readers as can spare the time to set aside the week commencing July 13 for a visit to the Convention? To those who have never attended such a gathering I promise a happy combination of pleasure and profit, upon which, in years to come, they will look back with none but kindly feelings. Mr. R. P. Drage, of 95, Blenheim-crescent, W., is the Honorary Secretary and Treasurer. He is never so happy as when taking subscriptions (*5s.* per annum) or giving information about the Convention.

I observe, from a short article in last week's Journal, that the editor passed his Easter at Southwold. Happy man! In reading the account of his wanderings, I came across a geographical slip, which I may perhaps be permitted to correct, because it will afford me the opportunity of smuggling in a reference to a somewhat similar slip of a more remarkable nature. Walberswick is spoken of as being *north*ward of Southwold. Of course, it should have been *south*ward. The other blunder I mention was made, I think, by Mr. Rider Haggard in one of his novels. In the particular passage I refer to (I quote from memory) he spoke of a noble ship steaming out of the mouth of the river Thames *towards the setting sun*. The sun usually sets in the other direction, I believe.

I have had a note made for some time to say a nice, pleasant word of Sir George Newnes, in recognition of the handsome manner in which he does justice to the many photographs he reproduces in his publications. Better blocks, better printed, of the ships, sailors, and soldiers that figure in *The Navy and Army Illustrated* would be hard to provide; while the same remark applies to *Round London*, in which one sees architectural studies of surpassing photographic excellence that deserve to be taken by the young photographer as guides for outdoor work. If all photographs were so well reproduced as they are in Sir George Newnes' establishment, photographers, block-makers, and printers would be relieved of much of the condemnation to which they are exposed at the hands of a growingly critical public.

Photographers who are compelled to adopt artificial light for projection, illuminating, studio, or domestic purposes generally, would do well to keep an eye on acetylene. It gives a beautiful white, virtually smokeless flame, and, employed without pressure, it is on all hands infinitely to be preferred to any oil lamp, to the incandescent light, and is only just sensibly inferior to oxyhydrogen with a blow-through jet. The sweet simplicity of the generating system, which merely demands that a small perforated metal cage should be filled with a chalk-like substance, and placed in a metal holder containing water, which, in contact with the calcium, disen-

gages a highly luminous gas, that has only to be conducted through rubber tubing to a suitable burner and kindled in the usual way, places the light within the reach of all. During the coming autumn we may possibly see the calcium carbide down to the price of hypo; in any event, a considerable number of cheap and handy generators will be on the market, so that photographers will have every inducement to try the light. Personally, I am charmed with it. If my readers have access to the LANTERN SUPPLEMENT of this JOURNAL for January 3 last, they will find an admirable and instructive article on the subject by Mr. Edwin Banks, probably the best article on the subject that has yet appeared.

Some of the most valuable and, at the same time, amusing information in photographic matters appears in the columns of the JOURAL devoted to the Society reports, and therefore (I fear) escapes notice on account of the dry-looking nature of the matter. For instance, at page 206 in the report of the Moseley Photographic Society, there is narrated a delicious bit of comedy, which casts a bright and instructive light on the proceedings at the meeting referred to. Dr. Radcliffe had given a lecture on *Home Portraiture*, and, the report proceeds, "the Hon. Secretary then made a few remarks respecting various points that had been raised, and made a few further suggestions which he thought might be useful to the beginner or home portraitist. Mr. Williams then said that he thought it quite unnecessary to make comments on what the lecturer had said, and thought it very presumptuous of the Hon. Secretary to take upon himself the criticism and discussion of the paper Dr. Radcliffe had so kindly given. The Hon. Secretary then called attention to a by-law which asked for comment, criticism, and discussion, and stated that he thought the greatest benefit to a Society would accrue from free and unrestrained criticism. He was sorry if he had not paid sufficient deference to the lecturer, for he felt that the greatest praise was due to the lecturer, Dr. Radcliffe, for his very excellent and instructive lecture, and proposed, as a vote of thanks that the lecturer take the fullest and most sincere thanks of an interested and instructive meeting. Mr. Williams seconded." We are not told whether the motion was carried, but it is to be presumed it was. The Hon. Secretary was, apparently, not only well within his rights in delivering his criticisms, but, upon being, curiously enough, rebuked for them, scored a great point by moving a vote of thanks to the gentleman he had taken in hand. The whole episode is very amusing, and suggests that down at Moseley they have a breezy or London and Provincial way of conducting a discussion.

The show and entertainment possibilities of the X ray boom are to be lifted from the smoky and mephitic atmosphere of the music halls and the cheap side show, and in a few days Lady Clara Vere de Vere and the "hupper suckles," generally, are to have an opportunity, in the patrician neighbourhood of Piccadilly, of submitting their delicate digits to the penetrative powers of the so-called new light. Where Society leads, the common herd usually follows—as witness the cycling fever among the fair sex—so that, in addition to its undoubted surgical uses and value, the New Photography will probably hold money for a good while to come. By the way, cycling has had to wait a long time for its boom; I wonder how long it will be before amateur photography is seriously taken up by "the classes," and will really diffuse itself widely among the masses. I question whether its possibilities as a popular pursuit have yet been realised.

COSMOS.

TRUTH.

[Photographische Mittheilungen.]

How often do we read and hear the expression "true to nature," especially in the loud trumpet-blowing praise of the new (?) three colour photography. It is used with a flippancy that can only be explained by the lamentable, widespread want of knowledge concerning art and colour. What is truth? said Pilate. What is truth in a work of art? To answer this question, first, we must be conscious of the peculiar creative method of the artist by means of which he unknowingly works out his wonderful inspiration. For some time, in personal association with painters, such as Gustav Richter, Eschke, Senior and Junior, Breitbach, the unrivalled Adolf Menzel, Knauss, Flickel, Kubiersky, Ehrentraut, Koner, and many others, we have availed ourselves of the opportunity, honourably and sincerely, to investigate their methods; and many things have suggested themselves to us, especially in connexion with those pictures, whose truth to nature is so justly appreciated by all.

Hildebrand thus paints a snow scene, and the snow is not white but blue. Is this truth? The sky is cobalt. We must examine the natural sky and cobalt through a spectroscope to comprehend the enormous difference between the blue of the heavens and cobalt-blue. And how is the sun depicted? A yellow spot, of at most fifteen candles' luminosity, whilst the real sun at the same elevation should be equal to about 6000 candles. In short, if we analyse the luminosities and the colours one by one, we find untruth upon untruth, and yet the picture, as a whole, is strikingly true, notwithstanding the blue snow and the cobalt sky. Worst of all, we do not even notice that the snow is blue, and it does not appear so, until everything but the snow is covered with black paper. The question, Why should this be? has led us to study colour, and to formulate our conclusions concerning colour perception in several articles, and they have not been without value to us in our attempts to imitate the colouring of the artist in printing in natural colours.

Unfortunately we have at the same time observed that our so-called educated public knows extremely little of art.

And how has this come about? We learn nothing of the kind in our schools; drawing only is taught, nothing of art, and in our schools for classical education the curriculum does not even include that. The representatives of so-called universal culture thus wander through the world, mostly without any art training, and they express their opinions upon works of art in a way that makes one's flesh creep.

They give pretentious definitions, impudently and dogmatically, of things they know just as much as they do of the man in the moon.

Much harm has thus been done. How can we counteract it? Not through the purse-proud financiers, who are the best customers the artists have. These gentlemen buy pictures, not because they see any beauty in them, but because they wish to get public renown for their galleries of modern works of art.

Painters say it is all the same whether our pictures are in Mr. B. Meyer's or Mr. A. Schultze's collection. The one knows as much as the other. But both can pay.

Only the school can lead the youth craving for knowledge into the right path. The optical lantern is being used more and more in our schools. This presents an opportunity for artistic, scientific, and geographical projections. We recommended this as long ago as 1870.

But we must ever remember that the finest lantern-slide, although very beautiful, may yet be untrue. This makes a knowledge of "the truth" of our photographs from nature imperatively necesaary.

ASTIGMATISM AND A NEW "STIGMATIC" LENS.

[Royal Photographic Society.]

My principal object in this paper is to treat of astigmatism with special reference to a new type of lens which I shall introduce to you later on, which is capable of giving flat images very free from this defect. In the first place, however, I think it conducive to clearness to put before you some sketch of the nature of pencils of light which show astigmatism, and spherical and other aberrations without special reference to any particular forms of optical systems, for, though we have become used to describing our lenses as having spherical and astigmatic aberrations, these qualities do not, of course, belong to the lenses, but to the pencils of light which pass through the lenses and are refracted by them. This subject has so often, and so well, been explained lately, that I fear it may be somewhat superfluous to go very fully into the question; my only excuse is that I may be able to put the subject into perhaps a slightly novel form.

In the first place, it may be considered well established that light consists of waves of small disturbances (probably of an electrical nature) which travel through transparent media with great velocity, about 180,000 miles a second, in just the same way as waves travel over the surface of a pond when a stone is thrown into it. A wave front is a surface drawn through particles of a transparent medium, which at any instant are in the same state of disturbance, just as a wave crest in the familiar instance of waves travelling over a pond is a curve drawn through the particles of water which at any instant are at the highest point which they reach in the course of their oscillations. The direction in which the light disturbance is travelling at any instant is the normal to the wave front at that

point, and this normal to the wave front is what is usually called a ray of light. A small bundle of these light rays or normals to wave fronts is what I call a pencil of light.

A pencil of light, all the rays of which pass through one point, is said to be free from aberrations. When the rays of the pencil do not all pass through a point, the pencil is said to have aberrations. Now, it is convenient to divide pencils of light into two classes, viz., small pencils and large pencils; and in like manner the aberrations into two classes—astigmatic, and what are called spherical. An astigmatic aberration is one that remains, however small the pencil of light we are considering be made, whereas a spherical aberration

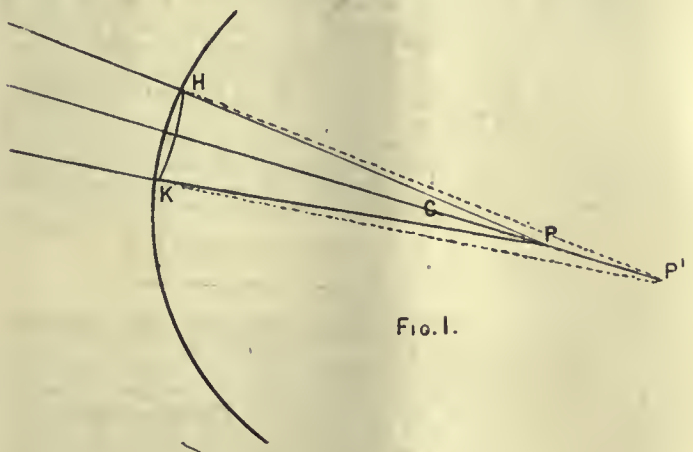


Fig. 1.

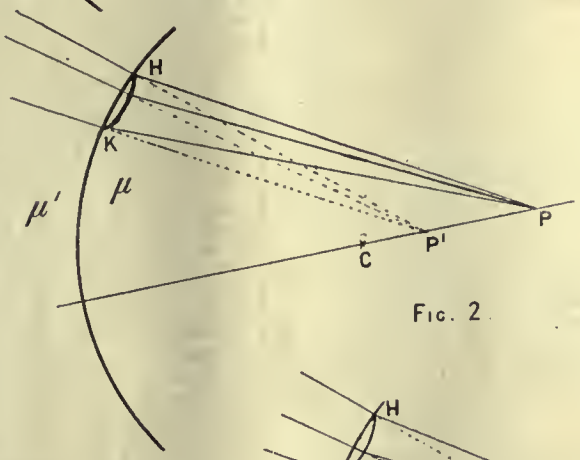


Fig. 2.

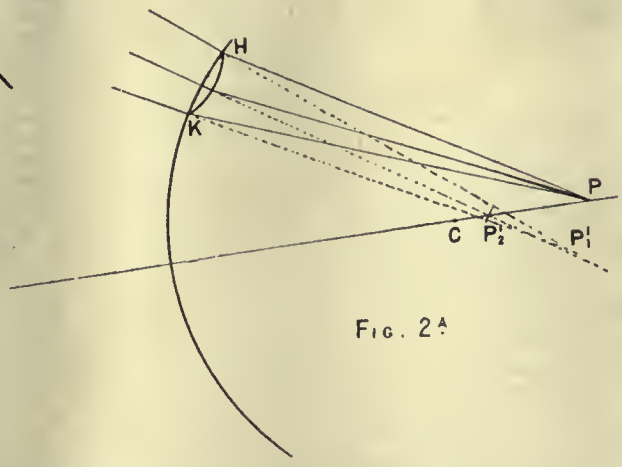


Fig. 2A.

is one that tends to diminish indefinitely with the size of the pencil.

To consider first the nature of one of these small pencils, or bundles of light rays. Selecting one ray of the pencil as a principal ray, it can be shown that all the other rays, in the most general form of small pencil, pass through two straight lines which are perpendicular to the principal ray; these lines are called the *two focal lines* of the small pencil. The two planes through the principal ray, and the two focal lines are called the focal planes of the small pencil. In the perfectly general case of a small pencil, the focal planes may be inclined to each other at any angle, but in the case of a pencil of light rays, which, as I have said, are all normals to a certain wave front, it can be shown that the focal planes are always perpendicular to each other. Such a small pencil, the rays of which do not all pass through one point, but only through two focal lines, is called an astigmatic pencil. I show some models constructed to explain the arrangement of the rays of small astigmatic and non-astigmatic pencils.

This theory is, of course, only strictly applicable to pencils which are considered indefinitely small; when we come to consider pencils of finite size, the rays of the pencil remote from the principal ray will not, in general, even pass actually through the focal lines, and these aberrations of the marginal rays of the pencil come under the head of spherical aberrations. The effects of these spherical aberrations in a pencil of finite size are, in general, very complicated, and I shall have to confine myself to a few special cases as they arise.

We can now approach the subject of the effect in a small incident pencil of the refractions it undergoes in passing through an optical system. The optical systems we consider consist of any number of spherical surfaces separating homogeneous refracting media, the centres of these spherical surfaces lying along a straight line which we call the axis of the system. Now, when a small non-astigmatic pencil of light rays is incident as a spherical refractive surface, the emergent pencil invariably shows these two focal lines of astigmatism, except in two special instances (figs. 1, 2, 2A):—

(1) When the incidence is normal, *i.e.*, when the small pencil passes through the centre of the refracting surface as in fig. 1.

(2) When the point from which the rays of the pencil diverge before incidence is at a certain distance from the centre of the refracting surface, *e.g.*, if we have a small pencil, PHK, diverging from a point, P, incident as a refracting surface where centre is C, then, if PC bear the same ratio to the radius of the surface as refractive index of medium of emergence is to refractive index of medium of incidence, then the part of pencil after refraction will all accurately pass through a point, Q, and this will be true, even if the pencil be of finite size as fig. 2 (fig. 3).

Now let AB be an optical system, PP^1 its axis, and let PQ be a flat object. Every point in this object is giving out rays of light, some of which pass through the optical system, and are refracted by it. Let P be a point in this object, and on the axis of the optical system. Let us consider the refraction of a small pencil emerging from P, and incident in the optical system along its axis, PP^1. Since this pencil will be everywhere nominally incident on the surfaces of the optical system, it will emerge without astigmatism, and it will therefore come to a focus at some point, P^1, in the axis of the system, P^1 being, in fact, the conjugate focus of P.

Now consider some point, Q, on the flat object, not on the axis of the system, and consider the refraction of a small pencil diverging from Q, whose principal ray lies in the plane containing Q, and the axis of the system, which we shall call the primary plane of the small pencil. Let QR be this principal ray. It is easy to see that, after refraction through the system, this principal ray will still lie in the primary plane, but, since the incidences of this small pencil are not in general normal, this small pencil after refraction will in general show astigmatism. It can be shown that one focal line (the primary focal line) will be perpendicular to the primary plane, and the other focal line (the secondary focal line) will lie in the primary plane. The points where these focal lines meet the principal ray of the emergent pencil we call the primary and secondary foci of the emergent pencil; let Q_1^1 Q_2^1 be these primary and secondary foci. Then Q is, in fact, the focus of rays of this small pencil which lie in

the primary plane, and Q_2 is the focus of these rays which lie in a plane perpendicular to the primary plane. Now draw two spherical surfaces whose centres are on the axis of the optical system, and which pass respectively through the points P^1 and Q_1^1 and P_2^1. The inverse of the radii of these two surfaces I call the curvatures of the primary and secondary images of the plane object given by the optical system employed with a small stop at R.

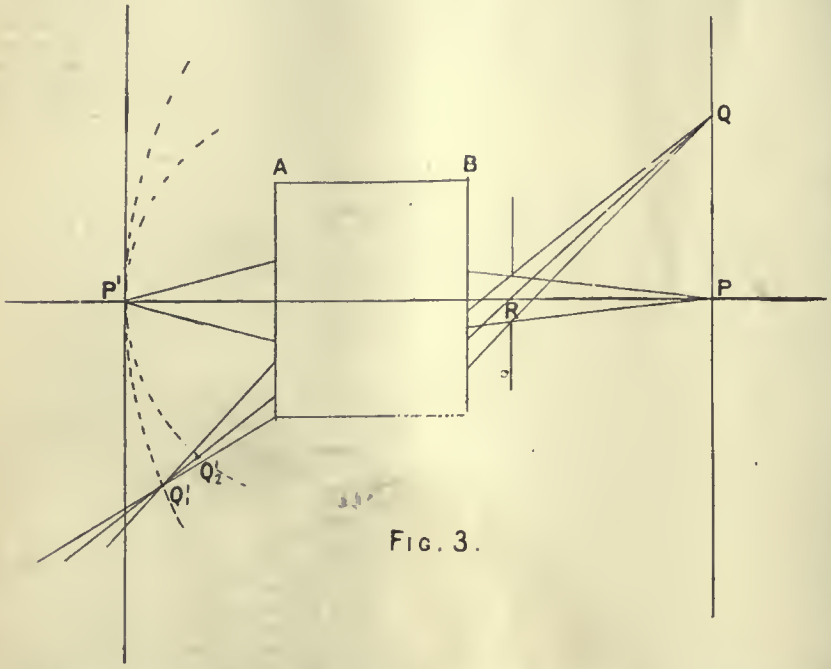


FIG. 3.

Now, both the primary and secondary curvatures depend in general—

(1) On the position of the small stop, R.
(2) On the distance of the object, PR, from the lens.
(3) On the nature of the optical system.

There is, however, a relation between the primary and secondary curvatures of the image, which I think I can call extraordinarily simple, considering how very complicated are most of the results which are obtained in the general theory of optical systems, and it is this, that, if from the curvature in the primary plane we subtract three times the curvature in the secondary plane, we obtain a quantity which is independent—

(1) Of the position of the stop, R.
(2) Of the distance of the object, PR.
(3) Of the thicknesses of the component lenses of the system and of their separations.

In fact, this quantity (one half of which I call the astigmatic constant of the optical system, denoted by U) is a function only of the curvatures of the surfaces and refractive indices of the glasses of which the system is composed. In fact, if by alteration of the position of the stop, or position of object, or thicknesses or separations of the lenses, we alter the curvature in the secondary plane by a certain quantity, we shall alter the curvature in the primary plane by three times that quantity, leaving the astigmatic constant unaltered. When I first discovered this result, I was so much surprised at its simplicity that I concluded that I must have made some mistake in my work. I soon, however, discovered by actual experiment that optical systems did, as a matter of fact, obey this law, and soon after I found that Airey, the late Astronomer-Royal, had actually proved this result for an optical system in which the component lenses are indefinitely thin; his work is reproduced in an early work on optics by Coddington (published in 1829). Airey apparently did not see that the result applied to a system of thick lenses, and it is certainly strange that the result remains absolutely unaltered, however thick the lenses of the system may be. In consequence of this law, the labour of constructing lenses on a purely theoretical basis is very much lightened; in fact, it is only necessary to consider the action of the optical system on the rays of pencils which lie in the primitive plane; for instance, if we construct an optical system which gives zero curvature in primary plane, we can at once deduce the curvature in the secondary plane from knowledge of the astigmatic constant of the system; in particular, if the astigmatic constant be zero, it is at once evident that the secondary curvature will also vanish. Now, it is our object to produce optical systems with a flat field free from astigmatism, in other words, with zero curvature in both primary and secondary planes. One condition, then, that such a system must satisfy is that the astigmatic constant must vanish. Now, as I have said, the astigmatic constant may be exhibited as a function of the curvatures and refractive indices of the component lenses. I shall, however, content myself with stating that, when the astigmatic constant vanishes, the sum of thicknesses of component lenses in the centre must be equal to the sum of thicknesses at the edge, or rather at some definite distance from the centre, each of such thicknesses being multiplied by a certain factor depending on the refractive index of the glass of which the lens is composed. For crown glass of low refractive index this factor is $\frac{1}{3}$, and for heavy flint glass this factor is $\frac{3}{8}$. Since these factors are very nearly equal (being in fact as 8:9), we see that in our "stigmatic" lens the aggregate thickness of component lenses in the centre must be (approximally) equal to the aggregate thickness at the edge. I can now give you a brief sketch of how such system can be constructed.

H. L. ALDIS, B.A.

(To be continued.)

PHOTOGRAPHY WITH THE BICHROMATE SALTS.

THE series of lectures upon this subject, arranged in connexion with the Affiliation of Photographic Societies with the Royal Photographic Society was commenced on Wednesday, the 15th inst., at the rooms of the parent Society, when Captain W. de W. Abney, C.B., D.C.L., F.R.S., delivered a scientific and historical preliminary lecture. The chair was taken by Mr. W. Thomas (Chairman of the Affiliation delegates), and there was a very small attendance. Captain Abney began with the discovery by Mungo Ponton in 1839, that ordinary paper, when soaked in a solution of bichromate of potash, was sensitive to light and showed a print produced in that manner, and proceeded to detail the subsequent investigations of Becquerel, Fox Talbot, Poitevin, Burnet, Fargier, Swan, and Johnson. Burnet's method of exposing through the back of the tissue suggested a means of utilising spoilt celloidin films, which, being immersed in a three per cent. solution of bichromate of potash and dried, would yield very good transparencies if exposed under a negative and developed with hot water in the usual manner, the print being afterwards intensified in an ordinary dry-plate developer. This was very similar to Mr. Bolas's method of producing reversed negatives, except that in that case the soluble gelatine was not washed out. Having sketched the principles of collotype, Woodburytype, and photo-lithography, the lecturer pointed out that the common yellow chromate of potash was also sensitive to light, and showed a transparency produced by that salt instead of the bichromate. He alluded to his experiments many years ago with regard to regard to the continuing action of light upon bichromated gelatine, and to the intensification of carbon transparencies by means of permanganate of potash. Incidentally, a protest was made against the meaning ordinarily attached in England to the word *actinic*. All rays of light were alike, and their effect depended upon the nature of the substance upon which they fell. Captain Abney showed that bichromate cut off the whole of the blue and a good deal of the green of the spectrum, and said it might be expected that the light which was active was that which the bichromate absorbed.

At the conclusion of the lecture the Chairman conveyed to Captain Abney the thanks of the Committee and also of the audience assembled.

The second lecture was given on Friday, April 17, by Mr. J. A. Sinclair (the Earl of Crawford presiding), upon the subject of *Carbon Printing*. In the course of a brief *résumé* of the various stages in the evolution of the process, he said that Blair's system of printing without transfer, invented in 1863, appeared to be identical with the Artigue process. Blair coated plain paper with gelatine slightly tinted on the surface, and soluble only in hot water, after which it was again coated with a mixture of albumen and syrup, bichromated, and dry carbon was then rubbed all over the surface. A demonstration of carbon printing by single transfer was given, and some prints on Artigue tissue were also developed. As a substratum for enabling drawing paper, &c., to be used as a final support, Mr. Sinclair recommended a five per cent. solution of gelatine, to ten ounces of which twenty drops of formalin should be added. The development of Artigue prints by means of very fine sawdust mixed with water was watched with much interest; the minute particles of sawdust had the effect of a fine file upon the surface of the tissue, dragging away the soluble portions of the film, and leaving the unreversed picture. He thought prints by this process would be found to contain details sufficiently harrowing to satisfy even "Dogberry." M. Demachy had sent over for exhibition a number of examples of the bichromated gum pro-

cess, which he had said must not be presented as an easy one, a qualification which Mr. Sinclair said applied equally to the Artigue method, and he thought both of them were too difficult to become commercial.

Votes of thanks were accorded to Mr. Sinclair and M. Demachy, and also to the Earl of Crawford for presiding. The attendance on this occasion was rather larger than before, but still disappointingly small, and it is much to be desired that the remaining lectures of the course will attract increased audiences.

The following are particulars of the next two lectures:—

Friday, April 24, *Collotype*, by W. E. Debenham, Esq.—Syllabus: Principles on which collotype depends—Albert's method—The modern process with water glass—Cleaning and grinding the plate—The first coating to secure adhesion of the printing surface—Drying and washing—The preparation of the second or sensitive coating—Details of precautions employed to ensure success—The drying oven—Applying the second coating—Drying—Preparing the negative for printing—The pressure frame—Exposure and washing out of the soluble salts—Drying—Details of the printing process—The press, rollers, and ink—Damping, or the so-called etching process—Demonstration of the work.

Tuesday, April 28, *Woodburytype*, by J. D. Geddes, Esq.—Syllabus: General principles—Negatives—Preparation of sensitised films and printing—Washing and drying reliefs—Hydraulic pressure and appliances—Metal moulds and preparation for printing—Waterproofing paper and ink—Printing—Fixing—Mounting—Various applications.

M. LIPPMANN ON COLOUR PHOTOGRAPHY.

Last Friday evening, at the Royal Institution, M. Lippman gave a most interesting lecture on *Colour Photography*, and a demonstration on the screen of some of the results. That something of more than usual interest was expected could be seen by the hurried way in which coats and hats were deposited, and a seat sought, in the lecture hall, even fifteen minutes before the time announced for the lecture. The number of well-known F.R.S.'s and scientific men who had put in an appearance testified to the fact that not only was an invention to be described, but also that there was a desire to suitably welcome and honour a French *savant*.

M. Lippmann prefaced his lecture with a few introductory remarks in French, but his apologies for any shortcomings as regards the English language were (as it turned out) unnecessary, for he spoke with remarkable clearness, and in language that was easily understood. He gave E. Becquerel the credit of the first serious work in colour photography, at a date about 1840, when he succeeded in taking a photograph on which colours were shown, but they could not be fixed, and so were only available in a dark room or place free from actinic light. He used sublimate of silver. In 1861, Charcot, Durand, and a German, all about the same time, were at work on three-colour photography, and, although he was of opinion that there is a great future for this, still the fact that three separate photographs have to be taken left it short of his ideal, especially as colours or pigments had to be employed.

He described his own plan as the "interferential method," and it is performed by one exposure only, and any film can be used and developed in the ordinary way. The only addition to the dark slide of the camera is a mercurial or silver backing to act as a reflector. When this announcement was made, the audience were enthusiastic to a degree, and no wonder, for the charm was in the simplicity of the invention. As the most convenient, he arranged his dark slide with an extra space, and, when the plate is put in position, a valve allows the mercury to flow down behind it, and forms a perfect reflecting surface. The photographic film is exposed with the glass side to the lens and light, and when developed with acid or alkaline developer, and fixed with cyanide of potassium, the natural colour can be seen by reflected light. It is necessary to so hold the photograph that these reflected rays fall on it in the proper position, as otherwise it is only black and white as used in a negative or positive. A dark backing is also required to the photograph.

Several photographs taken by this method were projected on a small screen, and to do this an electric opaque lantern was employed, the operator fixing the subject on to a rod that permitted it to be turned so as to get the colour from reflection of the incident rays. Among the subjects were a stained-glass window; a lawn, with lady sitting on a chair, and having a background of trees; a house illuminated by sunlight, with climbing plants on the walls; a mansion with tower and garden; groupings of flowers and fruit, and a gaily coloured parrot. It was stated in respect of the flowers taken in sunlight that a three minutes' exposure was given.

M. Lippmann, in his explanation of the results obtained by this process, used the phonograph for a simile or analogy, and said his opinion was that, as sound waves are inscribed on the phonograph diaphragm, so light waves were impressed on the film after reflection. A simple and telling experiment demonstrated to the audience that waves are both direct and reflecting, and at certain positions, where the two sets of waves meet, there is what is known as standing waves. A long indiarubber tube, attached near the ceiling, was set in motion from the floor, and the waves ran up to the top, and then returned in complimentary waves. By increasing the motion loops were formed of these waves, and at definite intervals there was no motion. The mercury reflector sent the waves of light back, and at half-wave lengths of the incident rays the colours of those rays proceeding from the object were impressed on the sensitive film.

The interference of light was well shown by making a sensitive film damp and placing it in the rays of the electric lamp in the opaque lantern. As the film dried, most beautiful colours were shown on the screen.

The best sensitive plates for the purpose of colour photography by this method are gelatine bromide, with gelatine in excess to about thirty per cent. by weight, and an ideal plate should be perfectly isochromatic.

As M. Lippmann had been at work ten years before he hit on this happy idea of the mercurial reflector and modified plate, it proves the old adage of perseverance, and that the try, try, try again policy nearly always leads to success.

G. R. Baker.

THE W. H. HARRISON FUND APPEAL.

	£	s.	d.
Amount already acknowledged	39	16	0
Leon Warnerke, Esq.		10	0
J. Stuart, Esq.	1	1	0
British Journal of Photography	1	1	0
Photographic News	1	1	0
D. A.		5	0
Hon. Sec., Camera Club	2	2	0
	£45	16	0

Further contributions will be thankfully acknowledged by

Fredk. H. Varley, 82, *Newington Green-road, London, N*

Our Editorial Table.

Catalogue Received.

Marion & Co., Soho-square, W.

An advance copy of the new catalogue just being issued by Messrs. Marion has reached us. We turn over its 136 large pages, which are lavishly illustrated and printed with rare excellence, and find that the volume evinces every sign of having been compiled with a shrewd regard to the actual requirements of the photographer of the moment. There are not, as in some catalogues we occasionally have sent us, obsolete or useless items of apparatus or sundries figuring in Messrs. Marion's catalogue. It is full of good things, suitable alike to the amateur and professional. A feature is made of Voigtlander's collinear lens, and many others of Messrs. Marion's specialities. The catalogue is sent post free for 1*s*.

Received: Results of Meteorological and Magnetical Observations at Stonyhurst College Observatory. 1895. By Rev. W. Sidgreaves, S.J.

The Frena Exposure Book.

R. & J. Beck, 68, Cornhill.

This little book, which is compact enough to be carried in the pocket, supplies a number of ruled pages for recording particulars of "Frena" exposures. By way of preface, there are given some useful notes on the duration of exposure for moving objects, table of movement, use of the swing back, packing films, and other information calculated to be of service to the users of Frena cameras.

The Year-Book of Photography and Amateur's Holiday Guide, 1896.

London: The Photographic News, 22 Furnival-street, E.C.

Besides appearing earlier in the year than hitherto, the *Year-Book* of our contemporary assumes, in the 1896 volume, which is now before us, some features that were not to be found in preceding issues. It is divided off into five sections, the first of which includes a number of articles on topics of practical interest by H. P. Robinson, Bothamley, Vincent Elsden, Hector Maclean, and other authorities; facts and formulæ, relating to development, printing, toning, and other operations, compiled by Mr. E. J. Wall, fill Section II.; the Rev. F. C. Lambert in Section III. sets forth in detail much useful and varied information with regard to photographic touring to various points of interest on the coast, and following upon a section devoted to lanterns and their accessories, the volume winds up with a terse and serviceable review of recent novelties in apparatus, &c. There are several illustrations, and the book, which reflects credit on all concerned in its preparation, shows by the nature, variety, and excellence of its contents that the requirements of the class of readers to which it appeals have been carefully studied.

News and Notes.

LANTERN SOCIETY.—On Monday, April 27, the subjects on the programme are: 1, *Stereoscopic Projection with the Lantern*. 2, *Among the Bees with a Camera*, by Mr. T. E. Freshwater, F.R.M.S., F.R.P.S.

THE KINEOPTICON.—A successful demonstration of Mr. Birt Acres' invention for showing animated photographs on the screen, to which we referred in our issue of March 27, was given in the rooms at Piccadilly-circus on Monday last.

MR. J. T. PATTISON, of Fawley Lodge, South Woodford, Secretary of the Sunbeam Postal Photographic Club, desires us to state that there are a few vacancies in the Club, and that he will be pleased to send full particulars to any photographers wishing to join.

WOLVERHAMPTON PHOTOGRAPHIC SOCIETY.—This Society will hold an Exhibition of Members' Work in the Blind Institute, Victoria-street, Wolverhampton, on Tuesday, May 5, 1896. The Judges are Dr. Hall Edwards and Mr. E. C. Middleton. The Hon. Secretary is Mr. G. Hanmer, 2 Dudley-road, Wolverhampton.

THE Editors of the *Photogram* write: "Will you do us the great favour of allowing us to ask your readers for their assistance in making *Photograms of* 1896 worthily representative of the present position of photography. This is the only annual attempting to reproduce the best work of the year, and we are anxious not to miss seeing anything that is really meritorious."

IGNITION TEMPERATURE OF ACETYLENE GAS.—Mr. A. E. Coldwell writes to the *Scientific American:* In experimenting recently with acetylene, I was surprised to find its ignition point so low that it would take fire through the gauze of a Davy lamp. I tested it by lowering the lighted lamp into a jar of the gas and also by directing a jet of the gas against the lamp. In both cases the acetylene took fire outside the protecting gauze about as easily as hydrogen would. CH_4 and C_2H_4 will not ignite in this way, and it seems strange that the higher carbide C_2H_2 should. It must be very unstable.

SHEFFIELD PHOTOGRAPHIC SOCIETY.—The Annual Musical Evening in connexion with this Society took place on Tuesday, April 13, at the Masonic Hall. The President (Mr. Nowill) occupied the chair. The first part of the programme was a lantern exhibition, consisting of a set of slides of interiors of English cathedrals and of Windsor, lent by Messrs. R. W. Thomas & Co. (Limited), and, by way of variety, a few slides made by members of the Society were also thrown on the screen at intervals. The lantern was under the management of Mr. E. Beck, who also announced the titles of the pictures. The second part consisted of vocal and instrumental music.

ACETYLENE is being tried as an illuminant on the Paris tramcars. The gasogene, containing calcium carbide and water, is placed on the rear platform underneath the steps. Though its weight when charged is only twenty-seven pounds, it is capable of producing thirty-five cubic feet of the gas, the illuminating power of which is estimated at fifteen times that of ordinary coal gas. The lighting is said to be very efficient, it being possible to read a paper in any part of the car. The cost, so far as the experiments have yet gone, works out at less than that of lighting by petroleum; but, as the car has only been in use some six weeks, it is not yet possible to give definite figures.

RADIOGRAPHS BY FLUORESCENT SCREENS.—"It may perhaps interest those who occupy themselves in photographing with Röntgen rays," says Herr Bleekrode in *Nature*, "to know that a very effective and rapid method is obtained when proceeding as I will explain. I had a piece of scheelite or native tungstate of calcium, such as occurs in a collection of minerals, crushed to a somewhat coarse powder, and made it into an emulsion with gelatine; this was applied in a consistent and uniform layer on a piece of stiff black paper, and after this was dried the surface showed numerous crystalline, glittering particles. The right condition for fluorescing was attained, as was evident, when a Crookes' tube in action was placed behind and looked at in the dark, though the luminosity was not so strong as with a screen covered with crystals of platinocyanide of barium. The paper, thus prepared, was simply laid down on a very sensitive photographic glass plate, with its fluorescent side, of course, in contact with the film; on the upper surface metallic objects or the fingers were put. Applying now Newton's focus tube (which, I may add, gave me excellent results in former experiments) with an induction coil, regulated to give sparks of five to six inches, I obtained sharply defined radiographs of keys, &c., in twenty-five seconds, and of the fingers, showing the bones and metallic objects hidden between them and the plate, in ninety seconds, distinct enough to perceive even the eye in a needle that was put in the epidermis. I also tried the fluoride of calcium mentioned by Professor Winkelmann, of Jena, but I perceived no fluorescence, perhaps because the powder was amorphous throughout. As scheelite is a very cheap mineral, large screens with fluorescent surfaces may be constructed at a trifling expense."

PHOTOGRAPHIC EXHIBITION AT WEXFORD.—Last week the first Photographic Exhibition held in Wexford was opened in the Town Hall. Not only from the point of view of the number of exhibits and the interest taken in the Exhibition by the local amateurs and the public generally, but also from the real merit of the photographs, the Exhibition has been voted on all sides an exceptional and unqualified success. The large number that filed down the stands in the Town Hall were not alone charmed by the array of first-class pictures of every kind, but very much surprised indeed at the undoubted merit displayed. There were on every side convincing proofs that amateur photography has seized hold of some of the best artistic talent in the county. It could be seen, too, that this talent was of no mean order, and, supplemented by extreme care and attention, has been put to use in the best possible manner in producing fine pictures. It was in the Enlargement Class that the highest successes were gained. In this class the exhibits of Dr. Drapes (Enniscorthy) won the admiration of all. There were several fine pictures of his on show, and it was a difficult task indeed to select the best. When, however, the Judge gave the first prize to *The Crofter's Home*, the public unanimously endorsed the decision. The fine collection of pictures from Mr. M. A. Ennis's studio attracted considerable attention and admiration. A very artistic lot were the portrait groups by Miss Jefferies, Newbay. Among the other successful contributors were Messrs. J. B. Pettigrew, Herbert Sutton, F. Owens, J. E. Shannon, E. S. O'Brien, B.E., J. O'N. F. Kelly, D.I., R. C. Roche, W. H. M'Guire, &c. The following are the awards: Class I. (Quarter-plate Landscapes), first prize, F. O'Neill Kelly, Wexford; second prize, F. J. Owens, Wexford. Class II. (Half-plate and larger-sized Landscapes), first, A. H. Sutton, Wexford; second, A. H. Sutton, Wexford. Class III. (Quarter-plate Portraits and Groups), first, Miss J. E. Jefferies, Newbay, Wexford; second, Miss J. E. Jefferies, Newbay, Wexford. Class IV. (Half-plate and larger-sized Portraits and Groups), first, Miss J. E. Jefferies; second, J. B. Pettigrew. Class V. (Instantaneous Subjects on Land), first, M. A. Ennis, Wexford; second, M. A. Ennis, Wexford. Class VI. (Instantaneous Subjects on Water), first, J. B. Pettigrew, Wexford; second, J. B. Pettigrew, Wexford. Class VII. (Interiors), first, E. S. O'Brien, Wexford; second, M. A. Ennis, Wexford. Class VIII. (Enlargements), first, Thos. Drapes, The Asylum, Enniscorthy; second, Thos. Drapes, The Asylum, Enniscorthy. Class IX. (Lantern Slides), first, F. J. Owens, Wexford; second, F. J. Owens, Wexford. Class X. (Opals), first, M. A. Ennis, Wexford; second, M. A. Ennis, Wexford.

THE CHEMIST'S ELECTRIC FURNACE.—Feeling that his Royal Institution audiences have had enough freezing at the bottom of the thermometric scale, Professor Dewar, in his new lectures commenced last week, decided to give them a little roasting at the top. In a word, he has ceased to discourse on the behaviour of bodies at 200 degrees of frost, and has commenced to describe the condition of things when the thermometer registers about 4000 or 5000 degrees "in the shade." Now, there is only one place on earth as hot as this, and that is between the carbon points of the electric arc light. It is a little cooler within the crucible of the electric furnace proper, but the difference is not of much practical importance. The chief lesson inculcated at last week's lecture was the extraordinary significance of the recent discoveries made by M. Moissan, of Paris. In the electric furnace Moissan has shown that carbon will do that which it will not at any lower temperature, namely, unite directly with such elements as calcium (the metal of lime), strontium, varium, aluminium, yttrium, and other elements of high density. The combinations so formed are called carbides. Their most remarkable feature is the way they break up or decompose when placed in water, giving rise immediately to hydrocarbon gases, which chemists have been trying in vain for generations to prepare otherwise than by roundabout and costly processes. Professor Dewar took the simplest case—carbide of calcium, which he prepared by simply mixing together lime and powdered graphite (carbon), and fusing them in the furnace. This carbide is a grey fused mass. Throw it into water and it immediately generates acetylene, a gas which is rapidly coming into use for illuminating purposes, since it gives a light eight times more brilliant than coal gas, and its little flame rivals the incandescent lamp. Hitherto this gas has been little more than a chemical curiosity, prepared only by costly and roundabout processes. But this is not all. If you pass the acetylene gas through a red-hot tube, the strangest thing happens. The gas begins to glow as if it were on fire inside the tube, and in the "twinkling of an eye" you are manufacturing "benzole"—that philosopher's stone of modern chemistry—the basis from which all our aniline dyes are prepared, and the parent of the hundreds of valuable substances which are known generally as "coal-tar derivatives." Hitherto benzole has been prepared by long and complex processes from coal tar. Finally, Professor Dewar spoke of some other furnace carbides, and their behaviour when placed in water, which is strange. Carbide of aluminium gives off "marsh gas," but the carbides of cerium, uranium, and other rare metals of great density beat the record by giving off nothing less than crude petroleum.

FAKENHAM EXHIBITION.—An Exhibition of Arts and Crafts, promoted by the Fakenham District Camera Club, was held under distinguished patronage in the Corn Hall, Fakenham, on Tuesday and Wednesday, April 14 and 15, and included a large number of photographs, photographic appliances, oil and water-colour paintings, art needlework, carvings, etchings, pencil and crayon drawings, &c. There was also a loan collection of paintings, engravings, curios, statuary, and natural history exhibits. The Exhibition was opened on Tuesday by the Rev. William Martin (President of the Club), who, in a neat speech, congratulated the Committee and the Secretary on the marked success of their efforts. He also drew the attention of his hearers to the great strides photography had made during the last ten years, and to its claims to be called a fine art; as an enthusiastic amateur whose experience dated back to the wet-plate days, he had watched with great interest the wonderful growth and ever-increasing usefulness and popularity of the art-science. On the Wednesday, the Exhibition was opened by the Countess of Leicester, who expressed her pleasure at seeing such a fine show, and hoped it would be in every way a success. There was a good attendance of the public on both days. The evenings were enlivened by the strains of an excellent string band, under the conductorship of Mr. R. S. Utting. The pictures and photographs lined both sides of the large hall, while the other exhibits were effectively displayed on stages draped with Indian cloths and art muslin. The assembly-room adjoining the main hall was set apart for lantern exhibitions of members and other slides, given each evening at eight o'clock, and lectures on the Röntgen X rays by Dr. Fisher, acting as substitute for Dr. Thomson, of Norwich, who was unable to attend. The limelight lantern was worked by the Messrs. Davis in their usual effective manner. The following were the awards in the competition classes:—General Photographic Work: 1, R. W. Copeman; 2, G. H. Davis; certificate, N. W. Hughes, W. H. Clutterbuck, E. A. de Haven. Enlargements: 1, R. W. Copeman; certificate, W. H. Clutterbuck. Mr. W. Tylar, of Birmingham, showed his well-known Tit Bits hand cameras and a collection of useful and ingenious photographic novelties. Amongst other stalls were noticeable that of Mr. J. J. Roberts, of Fakenham, with some fine enlargements; Mr. H. Applegate, of Fakenham, good general portrait work; Mr. R. W. Newman, of Fakenham, a tastefully arranged display of golf clubs, cricket bats, tennis rackets, &c.; Messrs. Bnne & Readwin, of Fakenham,

bicycles, leather work, &c. The photographic work of Messrs. W. H. Clutterbuck, R. W. Copeman, G. H. Davis, and N. H. Hughes was of a high standard, as was also that of Mr. C. Wood, who exhibited a book bound by himself containing 180 views taken on a cycle tour. Some fine artistic work sent in by Mr. C. Hewitt, of Gateshead, unfortunately arrived too late to compete. Mr. Sydney M. Broad's landscape paintings were highly praised.

Patent News.

The following applications for Patents were made between April 8 and April 15, 1896:—

Dark Slides.—No. 7365. "A Self-dusting Dark Slide for Photographic Cameras." R. Moodie.

Photographic Apparatus.—No. 7448. "Improvements in Photographic Tripod Stands, Printing Frames, and Cameras." H. J. Spratt, A. S. Spratt, and G. A. Spratt.

Printing.—No. 7462. "Apparatus for Photographically Printing Continuous Strips." B. Acres.

Cameras and Lanterns.—No. 7528. "Improvements in Combined Cameras and Optical Lanterns." B. Doyle.

Washing Vessel.—No 7715. "An improved Photographic Washing Vessel." A. A. Bradburne.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
27	North Middlesex	*Copying.* H. W. Bennett.
27	Camera Club	Members' Annual Exhibition of Pictnres opens.—The President (Captain W. de W. Abney, C.B., F.R.S., &c.), Opens the Sixth Annual Conference.
27	Lantern Society	*Stereoscopic Projection with the Lantern.—Among the Bees with a Camera.* T. E. Freshwater, F.R.P.S., F.R.M.S.
27	Oxford Camera Club	*Radiography; or, Photography by Röntgen's X Rays.* E. A. Ryman-Hall and E. L. B. Hill.
27	Richmond	*A Visit to India and Burmah.* Dr. C. Wyman.
28	Bournemouth	*The Modern Hand Camera and How to Use it.* F. O. Bynoe.
28-30	Camera Club	Continuation of Conference.
28	Hackney	Exhibition and Competition.
30	Bradford	Annual Meeting.
30	Liverpool Amateur	*Five Hundred Miles up the Nile, or from Cairo to the First Cataract.* David Lewis.
30	London and Provincial	*English Cathedrals.* Mr. Evans.
30	Oldham	Exhibition of Members' Transparencies.
May.		
1	Alntree and District	Stereoscopic Photography.
1	Camera Club	Annual Club Dinner.
2	Borough Polytechnic	Excursion: Kew and District.

ROYAL PHOTOGRAPHIC SOCIETY.

April 21,—Photo-mechanical Meeting,—Mr. Leon Warnerke in the chair.

Mr. T. Bolas, F.I.C., F.C.S., read a note as to the evolution of

Photogravure Methods in Intaglio and Relief.

Camera photography and photogravure, he said, took their birth between 1813 and 1816, by the labours of Nicephora Niépce, one of whose cameras, which he called an "artificial eye," being still preserved in the museum of Chalon-saur-Saone. His process was first called "Heliographie," but finding that direct sunlight was not essential, the name was changed in 1816 to "Photographie." The earliest work of Niépce now known to be in existence is a photogravure of a portrait of Cardinal d'Amboise, made in 1824; and the first photogravure plates made in this country were produced by Mr. W. R. (afterwards Mr. Justice) Grove, who about 1840 made the Daguerreotype plate the anode in an electrolytic cell, and obtained a very delicate intaglio. After referring to the work of Chevalier, Mr. Bolas described Claudet's method of etching Daguerreotype plates, in which the hollows were filled with ink and the bare parts gilded, so that the gold film could be used as a resist in further etching. Talbot etched through a film of bichromated gelatine, which was continuous but unequally hardened by exposure under a transparent positive, while Pretsch obtained his plate by moulding from the swelled and reticulated gelatine film. Talbot suggested the use of textile screens, and Burnett suggested ruled glass screens or random dots, Berchtold also mentioning line screens on glass, with shift at right angles. The Talbot Klic process now gave the very best results in photogravure for the typographic press. The fundamental advance made by Ives in 1878, which Mr. Bolas fully described, introduced a definite mechanical method of translating the gradation of the Woodbury relief into dots of correspondingly graduated area, the principle depending upon the compression or flattening of an elastic pyramid to a degree proportionate to the height of the relief. Mr. Ives's subsequent method of graining the negative by putting a ruled screen before the plate in the camera, so that each window in the screen should form a pinhole image of the diaphragm aperture, had now become general. Mr. Bolas exhibited a considerable number of most interesting prints by the various workers in connexion with the different processes, many of which were regarded as quite equal to the productions of the present day.

Mr. F. E. Ives, alluding to his method of mechanically translating the Woodburytype relief into lines and dots, said that Charles Pettit, of Paris, made a cast of the relief, inked the surface, put it in a planing machine, and cut V-shaped grooves in it, and in that way translated the relief into mechanical lines, and the date of record for this process was five days earlier than Mr. Ives's date of record for the impression method which accomplished the same result.

Mr. H. Wilmer and the Rev. F. C. Lambert raised a question as to whether a carbon resist could be laid on to the copper plate without a grain, and said it was quite possible to do so without the film lifting in the etching.

Mr. Bolas said his experience was that the film would not hold down without a grain.

Mr. W. Gamble thought it was largely a matter of the management of the perchloride of iron, which would lift the film if it contained much free acid.

The Chairman said the gelatine image formed a better resist if it was kept at least a day before etching, and, if heated, it would resist still more satisfactorily.

The Rev. F. C. Lambert showed a film which had stripped from a grained plate in consequence of too rapid drying.

Mr. Bullen remarked that better results would probably have been secured by Pretsch and others if they had been able to obtain ink and paper of the quality now obtainable.

Mr. Ives said Dr. Eder's Year Book credited him with the invention of the fish-glue process; but, although that was developed under his personal supervision, it was a modification of a French photogravure process adapted to the production of relief plates, the formula for which was found in an old Year-Book.

Mr. Gamble showed the first photo-zincograph ever made, produced by Colonel Sir Henry James.

The subject was further discussed conversationally by the Chairman, Mr. Chapman Jones, Mr. Debenham, Mr. Ives, and others, and the meeting closed with a vote of thanks to Mr. Bolas.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

April 16,—Mr. A. Mackie in the chair.

The Hon. Secretary, referring to the desire to have a portrait of the late Mr. Traill Taylor, expressed at a previous meeting, said Mr. Hay Taylor had kindly obliged him with a negative, and he had made a carbon print, which he now presented to the Association, and passed round. It was decided to frame and hang it in the meeting room.

Residues.

The following question was read: "What is the best course to follow to regain gold residues and make into chloride for use?"

Mr. Rapson, who wished to obtain this information, said he had about an ounce of residue, and asked whether, after dissolving in mixed acids, it would require any other cleaning to get rid of the acetate of soda, &c. He also required to get rid of the slight remaining acid still present after evaporation.

It was recommended to precipitate with iron and dissolve with acid, followed by repeated evaporation. Care should be taken to remove all the iron also, to prevent the reduction of the gold again. The addition of chalk to neutralise the acid was suggested.

Halation.

The Hon. Secretary said during a recent discussion various suggestions were made for avoiding halation, since which he had made some further experiments. They had discussed the question of plates *versus* films, and while away at Easter he had tried films for the prevention of halation with good results. The picture shown was taken directly in front of an east window, with an exposure of ten minutes at *f*-45, and there was scarcely any trace of halation in this window, speaking very well of the use of films for interior work. He had also tried exposures on the vexed question of the front of the plate *versus* the back of the plate, the test in this case being a naked gas flame. The results were in favour of exposing directly on the film in the usual way, and not through the glass. Regarding the question raised by Mr. Freshwater as to the possibility of avoiding halation in development, he very much doubted, unless one used very thickly coated plates, that it could be done. If one could get a very opaque film which absorbed all the light falling upon it, he thought the evil could be avoided to a very large extent. With thin films, however, it was different. There may be some gain in development, but not a marked difference under the same conditions. Of course, with the carbon process, it was very convenient to expose through the glass, and it would be interesting to learn how to overcome halation under these conditions.

Mr. W. D. Welford inquired what the effect of a blemish in the glass would be in exposing through the glass, local or otherwise?

The Chairman thought it would be local.

Mr. Welford said there seemed to be an impression that films would not give halation. He could show plenty demonstrating the reverse, however.

The Hon. Secretary suggested that the effect of dust was often mistaken for halation.

Mr. Freshwater had found proportionately long exposures less likely to yield halation than short exposures, and instanced some photographs taken through a conservatory and a couple of rooms. In some which were under-exposed the far window was almost blocked out, while in the case of fully exposed plates everything was sharp; there was detail throughout, but no halation.

The Hon. Secretary said there were three distinct stages in the production of halation. First, with a short exposure, when you get halation; second, a good or proper exposure, when you can develop the image before attacking the halation deposit; and, third, when the exposure has been still longer, where the halation is right through to the front and develops up with the image.

Mr. Harvey suggested that the yellowish colour of the film would prevent a certain amount of halation.

Mr. WELFORD said, if the thickness of the glass is responsible for the halation, how was it that in photo-mechanical work, where plate glass was often used, they avoided halation?

Mr. RAPSON, speaking of the amount of silver in the film, said his experience showed that the greatest halation occurred with plates richest in silver.

Mr. DRAGE suggested that the new stripping film coated on paper would probably be free from halation.

Mr. WELFORD did not think the cause of halation was known. The very fact that films are subject to halation is a proof that it did not rest altogether with the glass. There might be more in the spreading of light in the film. In answer to a remark, he did not consider that halation could be avoided by the use of a yellow screen.

Mr. RAPSON'S experience was that yellow screens lessened the chances of halation to a certain extent.

BRUSSELS EXHIBITION.

Mr. WELFORD gave a short account of the Brussels Exhibition. What struck him was the success of the British and American exhibitors. He was of opinion that they only attempted what could be rendered by photography, while Continental photographers had tried to get effects it was almost impossible to portray. Continental photographers had a lot to learn in framing and mounting.

Mr. ATKINS showed slides on Hill-Norris dry-collodion plates from drawings, drawing attention to the clearness of the film.

PHOTOGRAPHIC CLUB.

APRIL 15,—Mr. J. E. Hodd in the chair.

A circular letter was read from Mr. A. Mackie, asking for a subscription for the Traill Taylor Memorial Fund.

Mr. Nesbit showed some of the film negatives which he had made on his last visit to Paris.

Mr. Hodd passed a negative round which had been intensified, but did not yield a good print upon ordinary gelatine paper; he showed a second print on the Ilford special P.O.P. for thin negatives, which was better.

Messrs. Bridge, Foxlee, and Nesbit, however, agreed in thinking that a print at least as good could be obtained on albumen.

Mr. Isenthal promised for the 29th instant to give some information upon the X rays in connexion with medical work; he also promised to bring to the meeting one of the instruments used to make hidden matter visible.

MANCHESTER PHOTOGRAPHIC SOCIETY.

APRIL 9.—The President (Mr. H. M. Whitefield) in the chair.

The evening was devoted to a lecture by Mr. N. LUBOSHEZ, of the Eastman Photographic Materials Company, on

SUCCESSFUL PORTRAITURE AND PLATINO-BROMIDE PRINTING.

Mr. Luboshez took the latter subject first, that of platino-bromide printing, and gave his hearers a most interesting description of what that paper is. The paper is coated with an emulsion similar to ordinary bromide paper, *i.e.*, bromide of silver, the difference being that in bromide paper emulsion there are less silver salts in the gelatine than the platino-bromide, which has more in proportion to the quantity of gelatine; consequently, whilst being richer in silver, the image is still on the surface, and is absolutely matt. The lecturer showed that it was suitable for large or small work, by exhibiting an almost life-size three-quarter length enlargement of a lady, as well as several examples of small work. The surface of the paper takes colour or pastel well, and is very pleasant to work upon. In the case of negatives with excessive contrasts, Mr. Luboshez gave many examples of dodging in order to secure harmonious results; and for development he advises the standard ferrous oxalate without the addition of bromide, but with a proportion of old developer. The effect of this developer is to give pure black to white with good half-tone and gradation; it builds up the image gradually, the shadows first appearing, then the half-tones, and, lastly, the detail in the high lights. It also has the advantage of not developing a correctly timed print further than the right stage, being in this respect unlike amidol, metol, hydroquinone, &c. After fixing, the image can be toned to a beautiful brown by immersion into a solution of alum, 1 part; hypo, 10 parts; and water, 180 parts, which should be gradually raised to boiling point; the print is then taken out and washed as usual. Mr. Luboshez then proceeded with the second part of his lecture on successful portraiture. Many professional photographers, he said, were working upon wrong ideas in regard to the lighting of the sitter. They have a strong top and side light on the face of the model, and, in order to reduce the shadow thus formed, proceed to place a reflector on that side, which simply does away with all modelling by flattening and distorting. Several examples were illustrated on the blackboard of this falsity in lighting. It is a fallacy to say that the reflector cannot be done without, however deep the shadow may be, which fact was demonstrated by the lecturer inviting the President to step forward, when by means of a muslin diffuser, between the light and the head, it transformed the harsh root and whitewash lighting into soft and harmonious modelling. Mr. Luboshez advises a full exposure, always observing the maxim to expose for the shadows, and let the high lights take care of themselves; the subject of development was then proceeded with. If the exposure is unknown, it is advisable to commence with development, and, if the exposure has been sufficient or over-timed, bromide can be added by degrees, and, if much over, the plate may be put into a weak solution of bromide of potassium about 1 part to 100 of water, and development then proceeded with. If, on the contrary, the plate has been under-timed, there is far more chance of obtaining detail in the shadows than if there had been a strong developer with the addition of bromide.

Camera Club. — If all photographers were obliged to work under the conditions voluntarily, and necessarily adopted by Mr. R. B. Lodge, we fear that this art would very quickly die a natural death. Mr. Lodge is a naturalist as well as a photographer, and this particular branch of natural history, to which he has devoted many years of his life, is

THE STUDY OF BIRDS.

In this interesting paper, read before the Camera Club on Monday, last week, he fully explained the manner in which he shot at our feathered songsters without hurting them, and how, at the same time, he gained for science much valuable information as to their ways and doings. He illustrated his remarks with a series of photographs, many of which were beautiful pictures, and some of which were taken under extraordinary conditions. He uses the telephoto lens almost exclusively, and better examples of its usefulness in obtaining large pictures of distant objects were never exhibited. But, even with this aid, he was obliged to use expedients in approaching his quarry, which would deter most photographers from such work; he, therefore, need have no fear of many rivals in wild-bird study with the camera. He envelops himself in a huge bag, camera and all, and thinks little of crawling through ditches and over marshes for hours in the endeavour to stalk his game. By this artifice, he has been able to photograph birds of the most timid character while sitting on their nests or tending their young, and has laid up a store of pictures which would have delighted the heart of Gilbert White, as they bring pleasure to all who look upon them to-day.

ON the Thursday following Captain SPRATT read a paper on another kind of hunting, on which he had used the camera to great advantage. Its title was

ELEPHANT-HUNTING IN THE NEPAUL TERRAI,

and it was copiously illustrated with Kodak pictures, taken mostly from the back of one of the animals of which he discoursed. Commencing with a map of the north-east corner of India, the lecturer pointed out the stretch of country covered by the hunting operations, and then proceeded to give a succinct account of the manner of hunting the wild elephant adopted by the Nepaulese. A hunt of this description is organized by the Maharajah of the district every four years or so, not oftener, or the forest would be denuded of big game. The hunt takes place solely for purposes of sport; there is nothing commercial with regard to it. The Maharajah, when he goes a hunting, is accompanied by about 3000 attendants, consisting of hunters, coolies, and servants, and takes with him about 300 elephants, of which a small proportion are trained fighters. This small army of men is kept under an admirable system of control. There is no harsh treatment, plenty of smiling faces, and every one is liberally paid and rationed. The country is very beautiful, and, according to the views shown, consisted mostly of valleys just beneath a range of mountains, well watered by rivers and smaller streams. In several pictures the crowd of natives had a strange appearance, from the circumstance that each man carried on his back a kerosene tin to hold water. When a convenient spot for camping is reached, a long line of outposts is sent out to keep the wild elephants from getting too far afield, and there was some excitement one night when the camp was aroused by the firing of guns from some of these watchers. It transpired, on the following morning, that a large bull elephant had escaped through the cordon, and in a few hours' time the hunters were astir to follow in his track. Footprints of the great beast were plainly visible in the soft earth, and in many of these the additional print of a tiger's pad was seen, thus showing that there was another hunter on the war path. Each one of the party carried a heavy pistol to fire in the air to scare the elephant, or to use in a more direct manner should he show fight. The three hundred elephants moved into the forest, and the hunt began, silence being observed by all. At length the bull was sighted, and then all was noise and bustle, every one pressing forward in hot pursuit of the great creature, who was occasionally seen, as openings in the jungle permitted, 150 yards ahead. The chief object now became to run the elephant until he stopped to breathe. After a short time he was brought to bay, but before he could be attacked he again started off at full speed. Again he came to a stop, charged one of the pursuing animals and knocked him over. A third time he faced his many enemies, with a couple of hundred elephants crowding round him, but not one among them having the pluck to attack. At last a well-known fighting elephant was brought up, and he too turned tail, apparently knowing that the wild bull was more than a match for him. A second fighter was then called upon, and then the combat began, the two elephants charging at one another with heads down, and their skulls coming into collision with terrible thuds. At length the wild elephant, with loud trumpeting, acknowledges his defeat, and it now only remains for him to be captured and secured. With this purpose in view he is driven towards water, which on this occasion was found within about one mile from the place where the fight occurred. The poor beast drank deeply and long, and douched himself with spray, becoming so forgetful of his situation that he allowed the natives to crowd round him and hobble his hind legs. Being at length somewhat refreshened, he attempted to charge his enemies, but found that this was impossible. Two big elephants pushed him forward, and he was finally secured to a tree with five or six animals left to guard him, and to bring him into camp the next morning. By kind treatment he is in a few weeks subdued, and in as many months is quite under control. It may be supposed that captivity is not a very unpleasant fate for the elephant, for he is generally well treated, and occasionally, if of fine stature has little to do, beyond carrying some Eastern potentate in a gilded howdah on his broad back. Colonel Spratt is one of the very few Europeans who have had an opportunity of witnessing this magnificent form of sport, and he must be congratulated on his success in obtaining so many photographic souvenirs of such a unique experience.

Hackney Photographic Society.—April 14, Mr. W. A. Hensler presiding. —Members' work was shown by Messrs. Gosling, Hindsley, Dunkley, Carpenter, and Hensler. Mr. W. THOMAS read a paper on

PICTORIAL WORK WITH THE HAND CAMERA,

in the course of which he laid great stress on the following points: 1, To try for success in technique first, and for this purpose it was advisable practise to

time exposures until the requisite experience was attained; 2, the subject was of minor importance, and pictures could be made from very small material; 3, for pictorial work very little detail was needed. The form of hand camera was immaterial, but it should possess a good lens, of not too short a focus—say, five inches and five and a half inches for a quarter-plate—with the available working aperture as large as possible. Two large finders (not less than one inch in diameter, and, preferably, one and a half inches) should be provided. The view in the finders should be adjusted to exactly correspond with the amount thrown on the plate by the lens, and all extraneous subject be blocked out. The camera should have a good shutter. The precise form did not matter, but the speaker used the Thornton-Pickard, time and instantaneous. Dealing with the pictorial part, Mr. Thomas showed, by means of diagrams, the effect of lines and masses of light and shade in composition.

North Middlesex Photographic Society.—April 13, Mr. MacIntosh in the the chair.—Mr. MUMMERY passed round two negatives on Lumière's plates, one developed with a normal developer and the other with considerably more pyro, and asked the reason of the fog present. Beyond that it was not chemical fog, no satisfactory reason was arrived at. This led to a discussion on green fog in which Messrs. Child Bayley, MacIntosh and others took part. The Secretary passed round some prints produced by Mr. G. H. Moss's process on Whatman's and Joynson's drawing papers. Mr. MACINTOSH said the process gave very good results, but was very extravagant in silver. Mr. ADDISON asked how to fix plumbago on a bromide print used in touching up. Mr. BEADLE recommended exposing it to the steam from a kettle over a spirit lamp, which softened the gelatine and enabled it to hold the plumbago.

Aintree Photographic Society.—The Society were fortunate in having decided upon Saturday, April 18, as the date of their first monthly excursion of the season. The weather was delightful, quite a summer's day, and the drive of over fifteen miles through Orrell, Litherland, &c., to Crosby Park and Hall, and home by way of Ince village, Ince Wood, Sefton, &c., was very much enjoyed. Mr. W. Blundell met the party at Crosby Hall, and escorted most of them through the rooms, the other members scattering themselves over the extensive park with cameras. Over fifty negatives were secured. The next excursion is fixed for Saturday, May 16, to Knowsley Hall, by permission of Lord Derby.

Birmingham Photographic Society.—Tuesday, April 14, Mr. William Jones in the chair.—Subject:

THE RETINA AS A PHOTOGRAPHIC PLATE,

by Dr. I. O. Tunstall, M.D. Lond., President of the Sutton Coldfield Camera Club. Dr. Tunstall, in his opening remarks, said: "It has long been my feeling that a lecturer, in any attempt to bring intelligibly before an audience a subject of a special and technical character, does well to divide his subject very clearly into headings, and to resort, wherever practicable, to explanatory diagrams." Taking first the subject of "The Eye as a Camera," the lecturer said: "A camera in its simplest form is an optical contrivance by which, in a dark-closed chamber, an image of objects, external to the chamber, is projected on one of its walls. Even a lens is not essential, for it is possible that images should be projected upon one of the walls through a minute aperture unprovided with a lens; but, in our ordinary acceptance of the term, photographic camera, we include a lens, or system of lenses, a mechanism by which the distance between a lens and the back wall of the camera can be decreased or increased, *i.e.*, the focussing mechanism, and finally the specially prepared surface, ground glass, or sensitive plate, upon which the image of external objects properly focussed are to fall." Diagrams were used to show the optical principles of the formation of the image in a camera whose sole refracting image is a single bi-convex lens. The eye is a very complex camera. Instead of consisting of one or more simple bi-convex lenses interposed between media, which are the same on either side of each lens (the external medium in our photographic camera being always air), we have a series of refracting surfaces, and no fewer than three media. All rays of light that reach the retina must pass through cornea, aqueous humour, lens, and vitreous humour, and at the junction of each surface with its contiguous medium. Mathematicians have shown that, if the refractive indices and radii of curvature of the different media and surfaces are ascertained, then a complex optical system, such as that of the eye, can be reduced to a simple diagrammatic system of two media, and the curved surface separating them. But there is another difference also besides the difference in the complexity of media and curved surfaces between the eye and a camera; there is the wonderful accommodating mechanism of the eye essential for focussing purposes which can never be imitated by the focussing mechanism of a camera. In the eye the lens is not made of hard glass of which the curvature of the surfaces cannot be altered at pleasure, but of softish living tissue contained in a perfectly transparent capsule, whose margins are attached near a muscular ring that goes right round one sector of the eye. When this little muscle acts, it looseos the capsule (or suspensory ligament, as this outer part is called), and, the elasticity of the softer lens substance coming into play, the lens bulges, and so accommodation is effected for near objects. Accessory to these essential parts of the optical mechanism of the eye is the beautiful curtain, appropriately called iris, which shuts off peripheral rays, and keeps the image on the retina "sharp." We will now pass on to the consideration of that sensitive membrane, the retina which, without doubt, subserves for the organism a similar function to that subserved for the photographer by the sensitive plate. When I tell you that in its thickest part the retina is not more than $\frac{1}{50}$th inch in depth, you will be prepared to marvel at the complexity of its structure, even before one word is said explanatory of the functions of its various parts. The retina consists of seven layers, but we shall observe more particularly the layer of rods and cones, which structures, connected as they are through the other layers with the "nerve fibres," form the ultimate terminals of the optic nerve, and are without doubt the bodies in which visual impulses are first generated. The layer of rods and cones is the outermost of the seven, and light falling upon the retina must pass through the other layers before it can act upon these bodies. The rods and cones deserve a little more careful study than we can devote to the other layers. Each rod when observed under a sufficiently high magnifying power is seen to consist of two parts, an inner and an outer. The outer is absolutely cylindrical, whilst the inner is somewhat fusiform. Both appear to be slightly grooved longitudinally; but, whilst the inner is colourless, the outer is, in the natural state, tinged a pinkish purple by a colouring matter diffused through its substance. The colouring matter is known as visual purple. The cones, like the rods, are clearly divisible into two parts or segments, outer and inner. The inner are vinucated cones, very similar in shape to conical bullets, while the outer are regularly tapering elongated cones. The inner segment is marked longitudinally, the outer transversely, giving the appearance of being composed of superimposed discs. The distribution of rods and cones is not the same in all parts of the retina. On the greater part of its area the rods are much more numerous than the cones, the proportion shown in any vertical section being about three rods to one cone. Touching slightly upon the chemistry of photography, the lecturer proceeded to show very clearly how the retina could be compared to a photographic plate. It is possible, he said, by means of the visual purple to photograph a bright object on a retina, and to "fix" the photograph by a solution of potash alum. In conclusion, the inference to which the argument tends, even if it does not establish it in an absolute proof, is this, that just as in photography a sensitive plate is employed whose important constituents are photo-chemically active substances and sensitisers, so, in vision, phenomena occur which are curiously similar to the first series of those reactions by which the "light pictures" we call photographs are produced; for in the eye we have a sensitive plate, the retina. We have absolute proof that light can form pictures on this living sensitive membrane, and we have good reason to believe that in ordinary vision the stimulation of the terminals of the optic nerves, *i.e.*, the rods and cones, is brought about by chemical changes occurring in photo-chemically active substances contained in the outermost layers of the retina, the photo-chemical activity of one of which substances, viz., the visual purple, being easily demonstrated, and its *rôle* in visual phenomena being either that of a sensitiser or substance of primary importance as regards vision *vid* the rods.

Darwen Photographic Association.—April 16, the President (Rev. Henry Irving) in the chair.—Mr. T Mitchell, of Blackburn, was the motive of inciting a very pleasant evening.

PLATINOTYPE,

being the subject of his demonstration, was dealt with in a most presenting manner. The demonstrator, in his introductory remarks, mentioned Mr. W. Willis as being the inventor of the process, and gave a brief account of the history and chemical nature of the paper. For the benefit of any member who cared to make his own paper, seeing that the patent rights of the Company have now expired, the following formulæ were given, viz., No. 1: Ferric oxalate, 600 grains; distilled water, 5 ounces; oxalic acid, 40 grains. No. 2; Chloroplatinite potassium, 400 grains; distilled water, 5 ounces. Of No. 1 solution take 22 drachms; No. 2, 24 drachms; water, 4 drachms. The paper, after being sized according to the tint required (*i.e.*, gelatine for bluish black, and starch or arrowroot for brownish), is floated face downwards in the above solution for not more than three minutes, then dried in about 100° Fahr., care being taken not to exceed this temperature, otherwise fogged prints will be the result. He then exposed a number of prints by the aid of a platinotype printing lamp, as advertised by the Platinotype Company, charged with about thirty grains of magnesium powder, and also two cylinders of compressed oxygen and hydrogen gas, and Duplex patent regulator. The frames were placed about six inches from the flame until the magnesium was burnt away, after which Mr. Mitchell proceeded with the development, using the salts as sold by the Company on account of producing better half-tones, urging his audience emphatically upon the importance of having the developer at a *minimum* temperature of 60° and a *maximum* of 100° Fahr. On account of the vigorous action of the developer, Mr. Mitchell drew attention to the manner of development, which was better done by taking hold of the paper at each end and drawing it face downwards through the solution once. This, he said, was to prevent the adhesion of air bubbles on the picture, and to be more certain of damping the whole surface without leaving dry patches, as the action of the developer is so rapid that, by the time the manipulator notices the defects, it is very often too late to rectify. In addition to this, it allows a little more time to examine, and, with three immersions, the picture is generally about developed. After this, the prints were transferred to three baths of hydrochloric acid and water, one to sixty, and allowed to remain five, ten, and ten minutes respectively, then washed for about twenty minutes in running water, the whole operation of printing, clearing, and washing being complete in much under an hour. Another point which the demonstrator strongly emphasised was the use of pure hydrochloric acid during the clearing process, strongly advocated the rejection of the third bath immediately it assumed the least trace of slowness, this being essential if permanent prints are to be the result. Many prints were developed, ranging from quarter-plate up to 10×5. By making the following solution slightly alkaline, warm tones may be produced. Potash soda or the carbonates of these alkalies may be used, but on no account in larger quantities than just sufficient to turn red litmus paper blue (ammonia unsuitable): Oxalate of potash solution, normal strength (*i.e.*, 1 pound of oxalate dissolved in 54 ounces of water), 1 part; water, 2 parts. A number of prints were exhibited showing their different qualities and defects, viz., prints obtained with acid developer, alkaline developer, old developer, the defects of over-printing, and *vice versâ*, damp paper, also development with mercury, and brush development with glycerine. The lecturer was thoroughly at home with his subject, and treated it in a very interesting and attractive form.

Liverpool Amateur Photographic Association.—April 16.—Mr. W. LAMOND HOWIE delivered a lecture before the members of the Association and their friends, entitled,

FROM MOUNT BLANC TO THE MATTERHORN.

The lecture was illustrated by a number of lantern slides from negatives taken

by the lecturer, the route traversed being the French Alps, round Mount Blanc into Italy, Aosta, Milan (the chief attraction here being the beautiful cathedral), the Italian lakes, and Switzerland. The concluding slides showed some magnificent views of the Matterhorn.

Moseley and District Photographic Society.—Mr. Myersward, surgeon, was enrolled as a member. Mr. FRED PILDICH, Hon. Secretary of Aston Photographic Society, delivered a lecture entitled

WHY?

The lecturer explained that his intention was to give the ladies and gentlemen present an insight, as far as his ability and time allotted would allow. When he (the lecturer) first saw a plate developed, he thought it was wonderful. You take a drop of solution No. 1, and put in measure, then slash in some No. 2, and a few spots from a bottle No. 3, and, the plate having been put in a tray, the developer is flowed over, and in a few seconds the image begins to become beautifully evident. That seems easy enough. Hang it! I could do that. But, upon thinking it over, the lecturer said he saw that it was evident that the gentleman he was watching developing knew why he mixed his developer as he did, and knew why, when development was about half completed, he added some No. 1, &c., and he (the lecturer) came to the conclusion that, if he was to do anything at photography, he must know why he did it. Treating upon developing, the lecturer explained how, according as he understood it, the bromide of silver, &c., film upon exposure to light was converted into a sub-bromide in those parts. The lecturer explained by symbols how the developer composed of pyrogallic acid, water, and ammonia. The pyrogallic acid, being a greedy substance, would take the oxygen from the water, thus leaving the hydrogen free. But the hydrogen was of a fickle nature, and, after being engaged to the oxygen, which has gone, it must find another partner—hydrogen is no bachelor—and it joins the ($2NH_3$) ammonia, and makes another composition of ammonia ($2NH_4$). But where the light has acted upon the silver bromide and made it a sub-bromide, which is a less stable compound, the now altered ammonia is on the look-out for a partner, and the sub-bromide, which is a weak maid, is attracted by the ammonia, and falls, leaving the silver as the metal. Here, then, we have the developed negative. But, where the light did not act on the silver bromide, the ammonia does not attack it, and it remains. This is the creamy substance on the back of the unfixed plate. Hyposulphite, or, more correctly, thiosulphate, of soda is the agent used to clear or dissolve away this stabler bromide. In fixing, if a very weak solution of hypo were used, the sub-hyposulphite of silver is formed, but this is only soluble in a strong solution of hypo, so the plate would not fix, for the weak solution would not dissolve this sub-hyposulphite of silver. So we have to use a strong solution four or five ounces to the pint of H_2O. The bromide being dissolved away, the metallic silver is left in suspension in the gelatine film in a very fine state. The lecturer then explained the two developers, ferrous oxalate and hydroquinone. Hydroquinone was very nice and easy for a beginner, but when the tyro began to fell his way, and know why he did certain things, he would advise pyro and ammonia. Hydroquinone gives pretty negatives. Pyro ammonia gives good and brilliant prints. There is the difference. The lecturer closed, hoping that all would take a greater interest in the scientific side of photography, and more thoroughly learn and investigate these things, that he may be better enabled to develop his picture. The lecturer stated he would be only too glad if there was discussion, and would be pleased to answer, to the best of his ability, any question raised. Nobody else making a move, the HON. SECRETARY (Mr. Fred Coop) said that he must put in a plea for the artistic side of photography, and wished all present to understand that all this knowledge of the symbols and chemical equations was not necessary for the production of good negatives and good pictures. He advised them not to be discouraged because they had not the profound knowledge of the lecturer on these, to them, chemical hieroglyphics. Many of the best picture-makers did not know these things, and said they were quite unnecessary. If you had the artistic perception, and went out and saw a lovely view, beautiful massing of light and shade, and exposed your plate as experience (not mathematical, or chemical equations) had taught, you would be correct, and came home, you would have an opportunity or chance of producing a good picture; but, if you only have the scientific knowledge, you, when out at nature, would not perceive and appreciate the wonderful massing of light and shade and the beautiful composition and graceful lines, and should, in all probability, take an inferior view, and perhaps make a good technical negative. But you would not have had the chance to make the artistic picture the other had, and could only perchance show an inferior view. No doubt, if you can know some of the scientific side, it will help you, but to give pleasure to young and others you must have the artistic. Mr. RENNIE stated that the science and art of photography were only made possible through the energies of scientific investigators and discoverers, where would photography have been had they not helped? Therefore he would put in the plea for the scientific side of photography. Mr. FRED PILDICH then replied that photography had many branches in science, and was being used in so many different scientific directions, that, of course, they would have to be considered. He owned it was not absolutely necessary to understand in all cases "why?" but still he thought photographers would do better work and get better results by that knowledge. He was glad there had been discussion, it showed interest had been raised, and he thanked them cordially.

Newcastle-on-Tyne and Northern Counties' Photographic Association.—The ordinary monthly meeting was held on April 14, Mr. John Watson (Vice-President) in the chair. A resolution, proposed by Dr. Blacklock, that the Association adopt a scheme of competitions open to amateur members, was unanimously adopted. Details to be settled by the Council at next meeting. Mr. T. O. Mawson then read a paper upon

CARBON OR AUTOTYPE PRINTING,

afterwards giving a very interesting and successful demonstration of the process. [This will appear in our next.]

Oxford Camera Club.—The last meeting on April 13 was devoted to a lecture by Mr. Nahum Luboshez, of the Eastman Photographic Materials Company, on

PLATINO-BROMIDE PAPERS AND PORTRAITURE.

Mr. G. W. Norton occupied the chair. After pointing out the difference between this bromide paper and an ordinary negative, the lecturer gave the following as axioms, by following which good prints could be relied on with pure blacks and pure whites: 1. The developer to reduce all the sensitive material on which light has acted. Unless this is done, the blacks will not be pure, but tend to yellowness or muddiness. 2. The developer not to stain, or the whites will not be pure. Hence, not only pyro, but strong alkalies are to be avoided, as these tend to yellow the gelatine film. 3. The developer must have a constant composition, so as to ensure identical results at different times. He strongly recommended ferrous oxalate as fulfilling all these conditions, and also because the image comes up gradually, so allowing correction if anything is wrong. One part of iron solution to four of oxalate solution gave the strongest developer and blackest tones, but as low as one to ten could be used for very soft effects. The blisters often occurring in bromide-paper work were noticed, and shown to arise either from great differences of temperature or too great force of water. A frequent source of blisters was a newly made, and therefore ice-cold, fixing solution. As to portraiture, he considered the usual practice of photographers of using a reflector on the shaded side to lighten the contrast quite wrong. The effect of the reflector was to throw into light the parts that ought to be in deepest shadow, and hence give a false modelling to the face that destroyed true likeness, and entailed an enormous quantity of retouching to give an appearance of truth. A far better plan was to use a diffused light, as through tissue paper or ground glass, which lighted up the shadows without altering the modelling, just as shadows in a landscape are best photographed on a cloudy, not a bright, day. He illustrated this point most effectively by a wetted handkerchief on a stick, held between the light and the face of the sitter. The direction of the light was also extremely important, as a sphere could be made to look either more or less curved than in reality by alteration of the lighting, hence the sometimes lengthened and sometimes broadened faces in ordinary portraits. The development should be kept well under control, preferably by adding water. If, however, over-exposure was found, bromide could be added when the detail was out, so practically making the plate slower, and allowing density to be given.

Photographic Society of Ireland.—April 10, Mr. Alfred Werner (Vice-President) in the chair.—Mr. V. E. SMYTH delivered a lecture, entitled

THE ENGADINE,

which was profusely illustrated with very excellent slides, the majority being technically perfect, while a great number were very pictorial renderings of incidents and places visited by the lecturer during his journey. Mr. Smyth, in the course of his remarks, said he was indebted to his friend and co-traveller, Mr. Brown, for some of the slides; the majority were, however, of his own production. Starting from Dover, and crossing to Calais, of which two places some very good snap-shots were shown, the traveller passed on to Laon, and in this city some perfect bits of the cathedral were obtained, and some interesting historical matter, were lucidly described. A very amusing description of a battalion of French soldiers was given, and which the lecturer entitled "Going to the Canteen." A good deal of fun was produced by the introduction of a slide showing the return from the canteen, which consisted in a slide from same negative as above, being exposed to heat while still wet, causing the gelatine to run, the effect was ludicrous. Rheims, the centre of the Champagne district, we next visited, and some beautiful views of this place were shown, notably one of the Ancient Roman Arches, a very beautiful structure. Mr. Smyth must be credited with the excellent way in which clouds had been so successfully introduced. In Switzerland many places were visited, the principal being Berne, Interlaken, Thun, Chur, St. Moritz, and Pontresina. From all these places Mr. Smyth brought home some very pictorial records, and that this gave so much pleasure to an attentive audience is hardly surprising. Rarely have we seen anything better shown before this Society. Mr. Smyth's success may, in a measure, be attributed to his using a twin-lens camera, and thus was able to compose the picture more accurately than if using an ordinary finder; his works certainly favours the use of this style of hand camera if anything like success is desired.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PROCESS PRICES.

To the EDITORS.

GENTLEMEN,—Some misconception having arisen as to the effect of the resolution passed at the meeting of the various firms engaged in process engraving held at Anderton's Hotel on February 24, I am directed by the executive of this Association to ask you to be good enough to afford me the widest publicity possible to the statement that the rates agreed upon at that meeting were not to be registered as *standard* rates but as *minimum* rates, below which none of these firms represented at the meeting were prepared to undertake the production of work in the future.

It in no way binds them to undertake all or any classes of work at rates

as low as the *minimum*; in many cases the surrounding circumstance will necessitate charges considerably in excess of these *minimum* rates.—I am, yours, &c., GEORGE E. HOLLOWAY, *Secretary*.

47, *Lincoln's Inn-fields*, *April* 20, 1896.

THE ARTIGUE PROCESS.

To the EDITORS.

GENTLEMEN,—In much of the correspondence and articles on carbon printing without transfer there is a lamentable and persistent tendency to confuse the issues, and Mr. Foxlee's communication in the current number of your JOURNAL is no exception to this tendency. He informs us with the air of a new fact that the Artigue process must not be confounded with that of Pouncy or the other methods described by me. Why, that is what I have persistently insisted upon all along, in the face of the extraordinary perversity of some writers on this subject! In 1893 I brought the Artigue process prominently forward at the Conference which I gave at the Salon. The beautiful results which I showed were pronounced by the theorists to have been made under special conditions, not easily to be followed. Then the battle of confusion began, and, although at the succeeding Salon the most perfect results were shown in the pictures by Captain Puyo, the fact that they were carbon prints developed from the front never dawned upon those who, like "Dogberry" and Mr. Foxlee, say that "tolerably good results" can be obtained by this method under certain conditions.

Mr. Chapman Jones and his supporters will not accept the challenge which I made in your columns a few weeks back, and so allow judgment to go by default. In plain terms, they prefer the shelter of theoretical verbiage to a straightforward way of settling a contested point. It would be much more interesting if Mr. Foxlee would take up this challenge, for "Dogberry," in his anonymous position, must of course be allowed to write any amount of irresponsible vapourings, and cannot seriously be reckoned with.—I am, yours, &c., ALFRED MASKELL.

Ilfracombe, *April* 20, 1896.

PHOTOGRAPHY IN THE ILLUSTRATED PRESS.

To the EDITORS.

GENTLEMEN,—I think, with you, that it is high time that a protest should be uttered against the class of illustrations appearing in many publications, which depend on photography for the means of filling their pages with pictorial matter.

And I exult that you have been the first (as far as I know) to couch your lance and tilt thereat. Your "Ex Cathedrâ" remarks are to the point, and I, too, feel confident that no sensible man of the world will quarrel with your objections, but trust that they will be taken up, increase in volume, and swell into a purifying flood.—I am, yours, &c.,

7 *and* 8, *Park-street*, *Anlaby-road*, *Hull*. W. BARRY.

PHOTO-CHROMOSCOPES.

To the EDITORS.

GENTLEMEN,—With reference to the subject of Mr. Wall's letter on p. 255, I have not thought it necessary to mention Herr Zink, because my date of record for the invention antedates his, and his work is therefore of interest only as an undoubtedly genuine case of reinvention. What either of us did before our dates of record cannot be taken into account. Herr Zink's date of record (by a public exhibition), of a comparatively crude invention, is antedated by my application for a patent covering not only the same thing, but a far better construction—more powerful, more compact, more convenient, and stereoscopic. It is impossible to say when Herr Zink's work would have been put on record (possibly not at all) if he had, like myself, waited to make such important improvements.—I am, yours, &c., F. E. IVES.

24, *Southwick-street*, *Hyde Park*, *London*, *W.*, *April* 17, 1896.

ASSISTANTS AND THEIR GRIEVANCES.

To the EDITORS.

GENTLEMEN,—The grievances of the photographic assistant have lately been ventilated in your columns with persistent and unfailing regularity; for this privilege assistants owe a debt of gratitude to the late Mr. Traill Taylor, and also for the good advice, sympathy, and encouragement he constantly gave them in this JOURNAL. I think I am expressing the feeling amongst assistants when I say that they fully appreciate the continuation of Mr. Traill Taylor's kindly efforts on their behalf, and are not indifferent to the fact that these columns are still open for the expression of legitimate grievances. The publicity recently given to the complaints of assistants has gradually changed the general opinion on the subject. At one time it was thought that the photographic assistant could not possibly have a grievance, that his life was passed in a state of heavenly calm, undisturbed by a single pang in the happy hunting-grounds of the glass house and the dark room; but now, even the most optimistic printer suspects there is something "rotten in the state of Denmark" when he is compelled to work for 1*l*. a week in a glass house having a summer temperature of 110° in the shade, and a winter of somewhere near zero; and the most callous employer feels some shame at putting his operator to work in a dark room compared with which the atmosphere of the Black Hole of Calcutta would be a welcome change.

It can no longer be denied that the grievances of assistants are both pressing and real, and something more than the outpourings of a discontented agitator, or grumbling ne'er-do-well. Having admitted the reality of grievances, it remains to accurately specify what they are and then to seek for the remedy. In many instances the simple statement of a grievance is sufficient, and if laid before an employer in the right spirit he will instantly apply the remedy. The publication of grievances has already done something in this direction even in the firm indicated by a "North Wales Operator," and I have no doubt that in many other instances it has had a beneficial effect on the treatment of assistants by employers. Much, however, remains to be remedied, and this can only be done by combination and mutual trust amongst assistants. A want of trust is the chief difficulty, as will be shown by a case I will relate. A short time ago the following appeared in the *Clarion*.

"L. C. is a young girl working for a photographer as a finisher of photographs, for 12*s*. per week. She estimates her employer's profits at 100*l*. per week! The work is exceedingly trying to the eyesight, and carried on in a small, close, ill-ventilated room in which many other girls are working. No talking is allowed, and one girl is set as a spy to watch the others. Not content with ruining the health of the girls who slave to provide him with his enormous wealth by compelling them to breathe the vitiated atmosphere of his miserable dens of workrooms, he must also make their lives still more dreary and monotonous by forbidding them to indulge in a little pleasant conversation. What system of slavery could be more complete?"

"Julia Dawson," a member of the staff, appealed for help to remove this young girl from her position. I wrote to the *Clarion* promising to do what I could to bring the case of L. C., or others, before the photographic world. My address was published along with a special request by "Julia Dawson" to all unjustly treated assistants to write to me; yet in spite of this special appeal neither L. C. nor a single assistant took the trouble to communicate with me. Such apathy prevents any serious attempt being made to redress long-standing grievances. It was quite impossible to deal with the case of L. C. because of a lack of evidence. If L. C. had come forward to verify the facts stated, it is clearly a case for the workshop or factory inspector, whose duty it is to see that workpeople have properly ventilated rooms. I fear it is a dread of consequences which prevents L. C. and others from coming forward and openly stating the injustice under which they suffer. Nothing, therefore, can be done to help the sufferers, until some are bold enough to come forward to state what are their wrongs and who are the wrong-doers.—I am, yours, &c. JOHN A RANDALL.

April 18, 1896. 18 *Canbury Park-road*, *Kingston-on-Thames*.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

RECEIVED:—WELLINGTON & WARD; J. W. MOORHOUSE; E. MENTOR; B. G. DAVIS; "ONE OF THE DUPES;" W. BENNINGTON; and others. In our next.

DEVELOPING.—W. B. The bromide acts as a retarder, the alkali as an accelerator, and the pyro as the developer.

STAINS ON INTENSIFIED NEGATIVES.—PYRO. We fear we cannot help you without seeing a negative. Send us one and we will endeavour to suggest a remedy.

VALUE OF LENS.—B. BROWN. The catalogue price of the lens, if the one listed to cover 15 × 12, with medium stop, is 24*l*., less five per cent. for cash. We do not value second-hand apparatus.

STAINED NEGATIVE.—H. AYLWARD.—We are afraid it is a hopeless case, unless the stain is but slight. The only thing that occurs to us is, to whiten the negative again with bichloride of mercury, thoroughly wash, and then reblacken, using great care in the operations.

STUDIO.—T. ALSTON. By putting the background end of the studio close to the wall of the house you will lose no light, and will gain the advantage, that the high wall will stop off the direct rays of the sun at midday when they are most troublesome.

PROFESSIONALISM.—R. C. J. We think it will meet your requirements better to join the Photographic Copyright Union than the National Association of Professional Photographers. The former deal with photographers' copyright questions in an efficient manner, and that seems to be your only object.

COLLODION EMULSION.—C. A. BRITTEN. Pyroxyline suitable for emulsion purposes, whether bromide or chloride, may be obtained from Messrs. Rouch & Co., Thomas, or Hopkins & Williams. We do not expect that, with the pyroxyline, either firm supply directions for making the different emulsions.

SALE OF BUSINESS.—X. A. Z. If you bought the lease and goodwill of the business, and made no restrictions that the seller should not start a fresh business in the same neighbourhood you are without a remedy. There is no rule in the matter, it is simply a matter of agreement, and apparently you made none.

DRY PLATES AT THE CUSTOMS.—PROSPECTIVE TOURIST. As you speak a little German, if you have the plates labelled as photographic and not to be exposed to the light, you will have no difficulty on the German frontier, particularly if you carry the camera and stand with you, or have it conspicuously amongst your personal luggage.

SPOTS ON NEGATIVES.—F. RUSSELL. From the description of the spots we fear there is no remedy; you might, however, try immersion in a bath of alum and hydrochloric acid, such as is used for "clearing" purposes. If you think they are silver spots, try a weak solution of cyanide, or a solution sold for the purpose by Messrs. Marion.

SPOTTING OPALINES.—T. J. EVANS asks: "Can you please tell me the best thing to mix with the colour to spot prints before they are wetted to be put on opalines, so that the spotting will not come off when put in the water?"—A black-lead pencil is often used, so are oil colours. Special colours for the purpose are supplied by most dealers, and they will possibly be the best for our correspondent to use.

CELLULOID COLOUR SCREENS.—T. HORNER. Celluloid, or xylonite, can be had of various colours. It can also be stained, or dyed, of any desired tint if alcoholic tinctures be employed. But we doubt very much if, so treated, it would answer so well for colour screens in orthochromatic photography as collodion-stained glass plates. Celluloid would certainly arrest more light than a stained collodion film on glass.

STUDIO.—P. O'MALLY. If you object to ground glass at the side of the studio, use fluted glass; that will quite prevent the neighbour's children from seeing into the studio. Ground glass, however, will not obstruct the amount of light you seem to imagine, provided, of course, that it is kept reasonably clean. We say reasonably clean, because cleaning the glass is a thing that is but little attended to in many portrait studios.

MOUNTING.—ELPHIN says: "I should be much obliged if you would tell me through the JOURNAL which is really the correct way to mount an oblong view on a cabinet mount, *i.e.*, on the left or right side?"—As the mounts are very unsuitable for the purpose, it does not very much matter which end the name comes. Perhaps, on the whole, it will be best on the left-hand side. It ought, of course, to be at the bottom or nowhere.

A DOUBTFUL TRANSACTION.—W. A. writes: "Seeing an advertisement of a 'set' by a good firm at a low price, I sent the money for it, but have not received the apparatus, nor can I get any answer to three letters I have written. It is now ten days since I sent the money. What shall I do? The place is over two hundred miles away."—Lose no time in communicating with the Superintendent of Police in the district, giving full particulars. The thing looks very like a fraud.

CLEANING VARNISHED GELATINE PLATES.—A. WELSH asks how to get the films off dry plates that have been varnished?—Soak the plates for a day or two in water, to which a little American potash, or a little caustic soda, has been added. Then put into hot water, and the films will come off readily. It is a little doubtful, at the present price of silver, if the metal recovered will pay for the trouble, that is, if the value of time be taken into consideration.

CHEAP ENLARGEMENTS.—POPULAR asks: "What enlarging paper most closely resembles the collodion transfer, and to be equally suitable for rapid colouring, or nearly so, sizes, say, from cabinet up to 15×12, either busts or full figure? Ordinary bromide paper seems altogether too 'cold' to obtain the result desired in a cheap and effective way."—We can suggest nothing better for the purpose, if price is the chief consideration, than bromide paper. With judicious development an objectionable cold tone may be avoided.

STICKY CAMERA BELLOWS.—H. PINCHE says: "On opening my camera to-day—the first time for months—I found the bellows all sticking together, and, when separated and folded up again, it sticks as before. It is some kind of imitation leather, with, I fancy, indiarubber in its composition, by the smell. Can this be remedied?"—It is very doubtful. The only thing we can suggest is to rub French chalk well into the folds, and repeat the treatment from time to time. The best remedy, however, is to have a new bellows to the camera, as the composition covering has apparently perished.

RIVE PAPER.—M. T. writes: "Could you kindly inform me where I could obtain some Rive paper (plain)? I want a small quantity—a quire or two. Any pure paper free from acid would suit my purpose."—In reply: The paper is, we think, supplied by most dealers, or can be obtained of the agents, L. Trapp & Co., Budge-row, E.C.

TONING GELATINE PAPER.—H. C. If you cannot get such good tones with separate toning and fixing as you do with the combined bath, and are doubtful of the permanency of its results, why not try another brand of paper? There are several gelatine papers in the market that yield every variety of tone with the separate toning and fixing method.

REFLECTOR HAND CAMERAS.—GLENDALE writes: "On page 242 of last week's BRITISH JOURNAL OF PHOTOGRAPHY, in the second paragraph, you mention the fact of a 12×10 hand camera being focussed by means of a Vanneck reflector. Could you convey any idea to me as to how it works, or by whom it is supplied in this country? failing which, I should be much obliged if you could give me the number of the patent, if it has been patented."—In reply: Messrs. Watson, High Holborn, supply the Vanneck camera. What is probably meant is that the image is seen full size by means of a reflector fitted on to the top of the camera.

COLLOTYPE.—C. MILLEN. The two examples sent are a long way from being good, but they are, on the whole, not at all unpromising, considering that you have only been experimenting for a month, and have had no instruction beyond what you have learnt from what has been published on the subject. Be not discouraged, but persevere; a valuable process is not learnt in a day. It seems, judging from the prints, that the film is too hard, not sufficient moisture in it to repel the ink where not required. Possibly the plates were partially insoluble before exposure through too slow drying or being kept too long. Aim at getting them to absorb more water when wetted.

FLEXIBLE SUPPORT.—C. ANDREWS asks "What is the meaning of flexible support in carbon printing, and what is it?" and says, "Are not all carbon prints on paper on a flexible support?"—Yes, of course they are; but the term flexible support is applied to a temporary support of a flexible character, on which the picture is developed, to be afterwards transferred to another, in contradistinction to its being developed on a ridged one, such as glass, zinc, &c. The commercial flexible support is paper coated first with insoluble gelatine, and then with an aqueous solution of shellac. Before use it is rubbed over with a mixture of resin, beeswax, and turpentine, and then polished off with a clean rag. From this support the carbon image may be transferred, non-reversed, to paper or any other material.

COPYING VASES.—TERRA VASES writes as follows: "Would you kindly reply as to what is the best method to photograph a terra-cotta vase with black shiny figures on? We have to take several, and the difficulty is to get rid of the bright light reflected upon the black figures. We have to make outlines of all detail, photograph first, and, after tracing, dissolve out the basis with mercury. But this reflection destroys some of the detail and outline, and, as these vases are very ancient, we must get the drawing absolutely perfect, being for the purpose of illustrating."—It is very much a question of lighting the subjects, so that light from the bright parts is not reflected direct into the lens. The glazed portions can also be dulled by dabbing them over with putty, to which a little black pigment, such as lamp-black, has been added.

APPRENTICESHIP.—GELATINE writes thus: "I am an apprentice, having given twenty pounds' fee. The first year was chiefly spent in going with messages, the second year assisting at enamelling. Now, in my third year, I am in the studio. The master wants me to go back to the enamelling, as the enameller has left. I have refused. Can he compel me, it being my last year? Personally he is not a photographer, and, only for the kindness of the operator, I would be a duffer."—This seems to be another case of taking fees with apprentices, more with the idea of getting work done cheaply than with the view to teaching the business. We should say that our correspondent would be quite justified in not continuing to do such work as enamelling in the last year of his term. He could certainly, in a court of law, compel his master to properly teach him his business—and studio work is the most important part of it, according to the terms of the indentures—or return the money paid.

AN AMUSING REPLY.—RICHARDSON BROWN (who says he has no connexion with the party who replied to the question) writes as follows: "*Re* your paragraph 'An Amusing Reply.' In a handbook by Mr. J. Pike you will find the following recommended. Saturated solution sulphate soda, 6 to 10 drachms; water, 3½ ounces; pyro, 15 grains; and saturated solution carb. soda, 50 to 100 drops. This I have repeatedly used, and can testify to its general good qualities; and as sulphate is much cheaper than sulphite, and carb. soda (otherwise washing soda) is, in such a small quantity, absolutely without value, I cannot see but that the question asked is answered so far in a proper and businesslike way. As no size of plate is mentioned, it is fair to conclude that the writer alluded to one of the popular sizes, say, half-plate or quarter-plate, and I think, if you will take the trouble to test the sulphate, you will allow that it gives a good clear negative full of detail and perfectly free from fog. Of course, the hypophosphate is a printer's error, and it may be amusing or otherwise, but to the man who tries it probably otherwise."—As Richardson Brown's letter will probably be as amusing to our readers as the reply we quoted last week was, we give it in full. Is it not rather a pity that Mr. Brown did not correct the "printer's error" in the paper in which it appeared for the benefit of the one who put the query, instead of explaining it to us?

THE BRITISH

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EX CATHEDRÂ.

To the list of those firms who supply coils, batteries, and Crookes' tubes, for experimental work with the Röntgen rays, must be added the name of Messrs. Perken, Son, & Rayment, Hatton-garden, E.C.

* * *

We are pleased to learn that the Photographic Exhibition which the Corporation of Glasgow are about to hold in the new Camphill Gallery bids fair to be of a successful nature. It will open early in June, for about four months, and will be thoroughly representative of practical photography, while colour work and reproduction processes generally will receive much attention. The scientific and other sections are being organized under competent direction, and the Exhibition will follow the lines given in the preliminary prospectus, which we quoted in the Journal of March 6.

* * *

With reference to some correspondence that appeared in our pages last September upon the subject of a "free" baby portrait scheme, started by M. Jarchy, a photographer, of Union-road, Rotherhithe, we have received the following letter from a correspondent who lives in that neighbourhood: "You will, no doubt, remember that last September several letters appeared in the Journal *re* free babies' photographs; 1000 babies were advertised for by M. Jarchy, of Union-road, Rotherhithe, to be photographed free of any charge whatever. It was said that M. Jarchy would not take any of these free photographs without a frame was purchased from him for 2*s.* 9*d.* M. Jarchy denied this. Any way, sir, he sent you a circular, and on that circular it stated that M. Jarchy was going to give three prizes—1st, gold medal; 2nd, silver medal; 3rd, oil portrait, natural size, in a frame. The last day for taking these so-called free photographs was September 15, 1895, seven months ago, and there are several inhabitants of South London anxious to know when M. Jarchy is going to hold the baby show at the Town Hall, and distribute the prizes. Might I ask, sir, that M. Jarchy may reply through The British Journal of Photography when he intends to award the prizes and hold the baby show?" We shall be happy to afford M. Jarchy the opportunity of utilising our pages for the information he is, no doubt, eager to give, and which certainly seems called for. In order to assist him in framing his reply, we refer him to pages 580 and 597 (September 13 and 20) of our volume for 1895, where he will find reproduced a circular and a letter of which he was the author. He may desire to refresh his memory with the statements and promises there made.

* * *

The New York correspondents of the daily papers inform us that Mr. Edison's vitascope was exhibited in New York last week. "A series of life-size figures were projected on a screen which reproduced dances and prize fights with startling fidelity. The splashing of waves on the seashore was also reproduced." The "vitascope" appears to partake of the nature of the screen kinetoscope of Lumière, Paul, or Acres. The great genius of Menlo Park seems to have developed quite a passion for following in the footsteps of other inventors, a sign, maybe, of greatness and genius as it is understood across the Atlantic.

* * *

Any movement which has for its object the preservation in their natural beauties of our commons and open spaces deserves the support of all lovers of the picturesque among whom photographers should be not the least prominent. The Gospel Oak Photographic Society, which has its location in the neighbour-

hood of Hampstead, has, with commendable vigilance, cast an eye upon the gardening operations of the London County Council on the north-western heights, and has felt compelled to pass the following resolutions: "That the Gospel Oak Photographic Society, while appreciating the efforts of the London County Council in the neighbourhood of Parliament Hill Fields, desires to record an emphatic protest against the gardening operations being conducted on the western portions of Hampstead Heath, and more particularly against any interference with the lake known as the 'Leg of Mutton' pond, whereby its picturesque beauty may become impaired. That a copy of this resolution be sent to the London County Council and the Vestries of St. Pancras and Hampstead, with an earnest request that the operations complained of may be at once suspended. That a copy of this resolution be also sent to the photographic press and societies in London, with a view of obtaining their co-operation in the matter."

* * *

We congratulate the Gospel Oak Society on its action in this matter; it has set an example of public usefulness which, it is to be hoped, will not be lost upon other photographic societies, whose energies might not be wasted if directed to the defence of nature against the thoughtless aggression of County Councils and similar bodies. We trust the Gospel Oak Society will be supported in their laudable efforts to save Hampstead Heath, which so many know and admire, from needless "improvement."

RECOVERING GOLD FROM OLD TONING BATHS.

A question on this subject, asked at a recent London and Provincial Photographic Association meeting, tells us that information thereon is still wanted, though the matter has been treated in these columns before with some amount of fulness; but, in view of the fact that the more modern toning baths differ materially from the old alkaline toning solutions, some little uncertainty may be felt as to how far the old methods may be available. A reference to some of the earliest editions of Hardwich's *Photographic Chemistry* will put the reader in possession of familiar modes of treatment, which are as useful now as over a quarter of a century ago. The standard method of throwing down the gold remaining from spent solutions is to add a solution of ordinary sulphate of iron. The gold is thrown down in fine powder. There is no reason whatever why the most usually adopted plan—that with sulphate of iron—should not be adopted with sulphocyanide toning baths. There is, however, this point of difference: An old sample of iron crystals that have browned by long keeping will be quite effectual; but the presence of the precipitate will be masked by the deep blood-red colour that will be produced by the oxidised portion of the crystals, a very minute quantity of a ferric salt sufficing to deeply colour a large body of liquid upon the addition of a sulphocyanide. With ferrous salts, such as the clean crystals of what is familiarly known as protosulphate of iron, no discolouration at all is produced.

Hence, where both kinds of toning solutions are employed, the disused solutions may all be poured in one waste jar, and at a suitable time thrown down. It will, however, be better to choose nice clean crystals of the iron salt, and, if the only store at hand be browned, they may be washed in a little water before being dissolved. The chief part of the ferric salt being on the surface of the crystals, it will leave a comparatively pure salt behind, which may then be used. We may again remind the reader that the gold takes a considerable time to deposit entirely, so that the precipitating vessel should be left for at least a day before pouring off the supernatant fluid. When strong solutions of gold are precipitated, however, the metal falls down in heavier and more coherent particles; but this is an unlikely state of things under the circumstances we are considering.

The precipitate thus obtained is liable to be contaminated with organic matter, with silver, and with iron, even after being well washed, as is absolutely necessary. Hence it will be necessary to get rid of them, for the double purpose of securing pure gold for re-solution and of ascertaining the exact weight. By a series of successive washings in ammonia, water, hydrochloric acid, the gold would be fit for final washing in a small filter, which should then be dried, and the filter paper with its contained gold heated to redness in a porcelain crucible and then weighed, making a suitable allowance for the weight of the charred paper.

This residue may then be dissolved by the aid of heat in aqua regia in as small a quantity as possible. The result will be a strongly acid solution of the acid chloride of gold. It will be safe to consider that the gold used will produce double its weight of chloride of gold. It may be kept in solution of the usual strength, as the evaporating down and the reducing of this solution to the crystalline form is not really necessary, and, is, moreover, a piece of work rather beyond the inexperienced photographer.

It will be quite evident, from these remarks, that the treatment of gold residues is not an extremely simple matter, like throwing down chloride of silver from the washing solutions, and the question naturally arises whether the game is worth the candle. That it is worth while to obtain all the remaining gold from spent toning baths there is no doubt, the only point is as to which of the available methods involves the least trouble consistent with the avoidance of loss of the material.

In the majority of cases we very much doubt the advisability of taking this trouble, for the following reasons:—

We have recently had the opportunity of examining a number of the credit notes of the metal refiners received by a well-known photographer, who sends all his residues away. For a series of years the price given for the silver obtained ranged from 3*s*. 2*d*. to 3*s*. 5*d*. per ounce, a value which is about twenty per cent. above the market price of pure silver. Then, about twelve months or so ago, the price allowed exceeded 5*s*. per ounce. When asked for an explanation, the gentleman in question informed us that the increased price dated about from the time when he took up P.O.P. and the sulphocyanide bath. All his waste baths were thrown in the waste hypo vat, and the gold went down with the silver. If we assume that the residues sent away included about equal parts of a mixture of chloride and burnt silver paper, and of hypo precipitate, we see that the auric argentic precipitate from the hypo alone would be worth 10*s*. or 15*s*. an ounce.

From this and the previous considerations adduced, it is a fair inference to draw that, on the whole, the best way to treat old gold baths is to throw them all into the old hypo tub; but is such a "tub" usually to be found? We have often dealt with this subject, and we may once more have something to say upon it at no distant day.

An Isochromatic Lens.—The *Standard*, one day last week, in a notice of Mr. T. C. Hepworth's lecture on "Up-to-date Photography," says, Amongst the novelties dealt with is "the true render- of colours in relationships of black and white by the isochromatic lens." Great improvements have been made in photographic lenses during the last few years, but this is the first time we have heard of an isochromatic one.

A Novel Adjunct to Photography.—Photographers as a rule, nowadays, do not make fortunes, or, at least, so quickly as not a few did in years gone by. Many now have to supplement photography by other trades or professions even to make a living. The latest we have heard of with the view to a fortune is, in addition to photography, that of telling the fortunes of others. For this a photographer was last week sentenced, at Canterbury, to two months' hard labour. Fortune-telling, on the face of it, should be a lucrative calling, seeing that it requires no stock in trade or cost for material; but, as it involves the risk of a couple of months' "hard" occasionally, it is not so very profitable, after all.

Spring and Photography.—Spring and its effects are now with us, and we remind our readers, as we have done in some previous years, that there are many subjects that may be successfully photographed now which cannot be done at any other time with anything like satisfaction. There are, as most are aware, some subjects that are so buried with trees that they are quite hidden when the foliage is on, and to take them when the trees are devoid of it means a sombre and cheerless picture. But, if the view be taken now, while the leaves are small and the colour is light, excellent pictures, with quite a summer aspect, may be secured, yet showing the principal object as well as if it were photographed when the trees were leafless. If the opportunity be lost now, it will not occur again for a year. There are many woodland scenes, too, that will make excellent pictures now that it would be utterly useless to attempt when the trees have put on their full summer garb.

The Metric System.—The general adoption of this system in this country seems to be as far off as ever, if we may judge from the reply given by Mr. Balfour in the House of Commons one day last week. He said that he did not think that it would be within the range of practical politics to impose by law on the inhabitants of this country so great a change in their ordinary habits as would be involved in giving effect to the recommendations of the Committee on the Metric System. This is to be regretted, for, sooner or later, there is no doubt that it will be adopted here. England and America are about the only countries in the world that do not use that system in weights and measures. A Bill on the subject has been introduced into the House of Representatives of the United States, and the result of that, if it passes into law, may have some influence here, as we shall then be left alone in the world with our old system. All Continental photographic formulæ are given on the metric system, and often suffer by being put into English grains and ounces, inches and feet.

Amateur Photographers and the National Gallery.—It will be remembered that a few weeks back we made some comments on the correspondence between Mr. Craigie and the Secretary to the Trustees of the National Gallery, with reference to the refusal to allow amateurs to photograph the pictures. Last week a question on the subject was asked in the House of Commons, and, as might have been expected, the reply given by Mr. Hanbury was practically the same as the reasons we gave as to why they should not have the right, with further remarks added. It was mentioned that students are admitted to photograph the pictures, on the ground that they improve themselves in the knowledge and practice of art by the study of the works of great masters. But no such case can be pleaded for amateur photographers, who will gain nothing in the practice of their art that they could not acquire by photographing any picture not in the national collection; also, that, if they desired to possess the copy of a picture, they could do so at a cheap rate in the market. It is scarcely necessary to add that Mr. Hanbury's reply evoked an emphatic "Hear, hear" from the majority of the Members present in the House.

A Valuable Engraving.—It is sometimes said that the proof of the value of a thing is what it will sell for. On Saturday last, at Sotheby's rooms, an engraving was disposed of at auction for no less a sum than 300*l*. This is about the highest price we remember an engraving fetching "under the hammer." The print in question is a mezzotint by Prince Rupert of Bavaria, entitled, *The Executioner of St. John the Baptist*. It is said that this is one of the oldest mezzotints known. As time passes, so will old engravings, both line and mezzotint, increase in value, for the simple reason that these styles of engraving are fast becoming a lost art. As the old engravers have died off, there have been no new ones trained to take their places. Photogravure has, no doubt, had much to do with this, and we doubt very much, in face of the perfection it has now attained, that, however skilful an engraver of the old style might be, he would now find his work remunerative. Further, plates that used to take even years to engrave are now produced by photogravure in a few weeks—an important consideration, particularly with subjects of passing interest.

Guildhall Water-Colour Exhibition.—The annual loan collection of pictures is now on exhibition in the Art Gallery of the Corporation of London, and a very fine one it is. This year it is confined entirely to water-colour pictures, of which there are about 160, all of the British school. Several of the works have never before been publicly exhibited; notable is one lent by Her Majesty the Queen, Henry Tidey's *The Feast of Roses from Moore's "Lalla Rookh,"* also about twenty little vignettes by Turner, lent by Sir Donald Currie. Amongst the names of the artists represented may be mentioned David Cox, De Wint, Copley Fielding, Birket Foster, Sir John Gilbert, Prout, Holman Hunt, Millais, Poynter, J. W. M. Turner, Clarkson Stanfield, and many others of equal fame.

A GREAT deal has been said at times about the fading of water colours, and that makes an exhibition of this kind additionally interesting to those who have to do with photographs finished in water colours. In some of the oldest works shown at Guildhall—the catalogue gives the date of the majority of the pictures—the colours appear to be as strong and brilliant as the day they were painted; but that cannot, unfortunately, be said of all, even those of comparatively recent date. This rather inclines one to think that modern masters are not so particular as to the pigments they employ as regards stability as were those of the older school. However, very much may be due to the conditions under which the different pictures have been kept as regards exposure to strong light and varying atmospheric conditions.

As this is the only chance that the public will have of seeing many of these works, the opportunity should not be lost. The Exhibition will remain open till July 31, on week days from 10 till 7, and on Sundays from 3 till 7. The admission is free. It may be mentioned that five of these annual loan exhibitions have been held, and they were visited by nearly a million persons, a very good proof that they are appreciated. In addition to the water colours is the collection of works illustrating the sculptor Goldsmith's, a gem-engraver, art, chiefly of the fifteenth and sixteenth centuries, lent by Sir J. C. Robinson. These were in the Exhibition of last year.

PRACTICAL PHOTOGRAPHY WITH RÖNTGEN RAYS.

THE inquiry by "Photophil" (apparently from abroad), in last week's JOURNAL, has confirmed me in an impression I have for some time felt, that some practical instruction in the necessary working details would be interesting and useful to a large number of readers of this JOURNAL, who, being quite ignorant of electrical matters, scarcely know how to set about fitting up the needful apparatus, and who, indeed, do not know what is needful.

This information I hope to be able to supply in the following chapter, with also some idea of the cost. It is about thirty years since I first worked with the apparatus known as a Ruhmkorff coil, and the experience since accumulated I have found useful in enabling me at once to set to work with the Röntgen rays.

It will be well to "begin at the beginning," as I am assuming that my readers know nothing practically of what is required. Every one is, of course, aware that the new rays are connected with electricity and Crookes' tubes; what the latter are, and how the electricity is utilised, will be seen. The process may be briefly epitomised: The electricity is first generated, then altered in character by being passed through a species of transformer termed an intensity coil, then passed into a suitable Crookes' tube. There then emanate from the tube the new rays which have equally interested the general and the scientific public, and about which it will not be needful for me to write.

The Source of Electricity.

It is quite possible to use one of the many forms of "frictional electricity machines" (to use a popular form of description), *i.e.*, that kind of machine in which a glass plate or plates, or a glass cylinder, is turned by a handle when electricity is generated; but, for practical purposes, it will be well to disregard these entirely, and look to current or Voltaic electricity as the source of the required energy. This, where no local electric supply is available, is obtained by the use of one or other of a very large number of forms of "battery," the choice being dependent on various considerations. The battery, the source of electricity, may be likened to the boiler of a steam engine, the coil being represented by the engine, and the forms of battery are as varied as are those of boilers. For coil work it is desirable to have a sufficient supply of electric current of high power, and to have it readily available and constant in character. First and foremost among these sources must be placed the well-known, or, at least, often-quoted, "accumulator;" but these are more costly and involve, when they are exhausted, either the despatch to a storage company for recharging, or this being done by means of a voltaic battery. As it is the purpose of this article to recommend the cheapest and easiest mode possible consistent with good work, I will leave this form aside, after saying that, where available, it is the best form for many reasons.

The Leclanché battery, that may be in the possession of some readers, is by no means a desirable form, as it quickly "polarises," *i.e.*, ceases to work till "rested," and a large number is required to obtain the requisite amount and strength of current. It will not be desirable to enumerate all possible forms of batteries, but a few useful forms will be referred to. They are the Grove, Bunsen, and bichromate batteries, in order of their excellence. The Grove "cells" (*i.e.*, batteries or electricity-producers) are the dearest and best; the Bunsen's are almost, but not quite, as good, and the bichromate batteries are exceedingly useful, handy, and free from chemical vapours. For small coils, nothing could be more handy for an hour or two's work; but, for larger coils, they become expensive if the necessary arrangements for disconnecting, &c., when not in use, be applied. The "two-fluid" bichromates are more useful than the "single-fluid," but, being more complicated, they are less removed from the Grove and Bunsen patterns. If, however, little work is required of them, half an hour or so, occasionally, a supply of the bottle form is serviceable if they are kept clean, and free from the crystals that are apt to accumulate upon the working parts. If it be desired to work for a few hours together, and to get the best form of current possible constant for several hours together, my strong advice is, when accumulators are not available, to select a Grove or Bunsen, preferably the former, which is considerably dearer than the Bunsen, but more durable if properly worked, and giving a stronger supply of the electric current. It consists of an outer cell of glazed earthenware, in which fits a second, smaller, cell of porous earthenware. A piece of zinc, bent letter U shape, is placed in the larger cell, with the other cell inside it. Within the latter hangs a piece of platinum sheet. Proper fittings are supplied for attaching wires to lead away the current generated in these cells. They are put in action by filling the outer cell with diluted sulphuric acid (about 1:12 is a good proportion), and the inner cell with strong commercial nitric acid. This battery should either be placed in the open air or in a fireplace with a good draught up the chimney, as, after it has been working some little time, it gives off objectionable fumes of nitrous acid, offensive to the senses and injurious to any metal fittings which they may come into contact with. Lenses and cameras would soon be injured if the fumes were allowed to escape in a studio, for instance. It is an important point, to avoid wasting the zinc, and to prevent the current being depreciated, to keep the zincs well amalgamated with mercury. Many plans are recommended, but the simplest I think will be the one I adopt. Some bichloride of mercury is placed in a cup, and a mixture of hydrochloric acid and water (one to three) poured upon it, and the mercury salt, say one to ten of solution. This mixture is well rubbed over the zinc surfaces, especially at the inside of the U, with a piece of stick on which has been tied a piece of rag or cotton-wool. The zinc will then be covered with a film of mercury, the advantage of which lies in the fact that, when the battery is not working, there will be little if any wasting of the zinc by the acid acting upon it. The battery is working when the wire leading from the zinc is connected (either through the coil or otherwise) with that from the platinum. When several cells are employed, the zinc should be joined to the platinum and that to the next zinc, and so on, the two fluids of each pair forming a connecting link for carrying the current, This method is called joining the cells in "series," and for working a coil is better than joining all the zincs to one leading wire and all the platinums to another ("joining in parallel").

In order to understand electrical references it may be observed that the positive current is supposed to go out of the battery by the platinum and to enter it again through the zinc, the former being termed the positive pole or anode; the latter, the negative pole or cathode.

Before leaving the subject of batteries, I should impress upon the reader the desirability of most carefully cleaning and washing all the parts when putting it away. The acids should be emptied out, (remembering that nitric acid (aqua fortis) is a most corrosive fluid) and freely diluted with water when running them into the sink. When pouring this latter, or, indeed, any corrosive fluid from one vessel to another, very great care should be taken that no minute drops are allowed to splash into the face, a very little will suffice to blind the eye if spirted in it. All the brasswork should be well washed and dried, as the screw fittings are apt to corrode. Messrs. Griffin have recently supplied me with a set of groved cells in which the ordinary binding screw for binding the platinum to zinc is replaced by a brass clip worked with a helical spring instead of screw, which is a great improvement upon the usual pattern.

G. Watmough Webster, F.C.S., F.R.P.S.

(To be continued.)

DIGRESSIONS.

V.—The Convention.

It is the inalienable right of every man to have a holiday at least once a year if he can get it, and, if he is wise, he will struggle for it. Then let him beware what he does with it, it is too precious to be wasted.

Some say the best way to take a holiday is to get right away out of sight and sound of your ordinary occupation. This is nonsense. I know it from practical experience; I have tried it once in my life and—"never again for me." This was only two years ago, when I went on a cruise in lovely waters, and, with a cruelty that made me feel bad, left my camera behind. The agony of some moments of that voyage was intense. Lovely subjects would persist in arising and deriding the man who left his camera at home. It felt wicked to feel wild that everything was so beautiful. There was one time I remember that was so bewilderingly enchanting, that I could not stand it, and sneaked down below until it had passed.

What is man without the means by which he lives, especially if those means have been chosen as a delight as well as a living? Ask a landscape painter to come into the country and forget his art. The proverbial London waiter enjoys his half-holiday much better if

he employs it in helping a friend, or taking his place, and, at the other end of the scale, I have heard of a couple of millionaire merchants stopping in the middle of a turnip field when partridge-shooting, to discuss the price of produce. Even a golfer, when he goes for a holiday, takes his clubs with him, and, as the business in life of every young man when he is off his cycle seems to be golf, he certainly does not leave shop at home.

Having exhaustively proved that it is not wise to leave shop at home, the next thing is to find where you can get it best. Fortunately this is not difficult for a photographer to decide, a matter which is already cut and dried for him. It is now becoming one of the best-known facts in the history of photography that the annual meeting of the Convention, wherever it is held, is the happiest place to enjoy talking shop in the world; it is a fairy-land of make-believe, and is not only harmless, but salutary. We Conventionists do some things in the most serious and solemn manner, as though we were *not* out for a holiday. We have an exhibition, so that we can delightfully abuse each other's works, just as if we were in Piccadilly or Pall Mall; we read solemn papers and feel good; we listen and make-believe we are scientific; we dine—this is real—of course, we go to a photographer in our thousands to have our portraits taken, like all good people; and, of course, we have our lantern shows. I am not sure we shall be safe from Röntgen rays, although I don't see how, on the small excuse of our having lent the electricians a prepared plate, they can claim sufficient kindred with us to warrant them in disturbing our enjoyment. There are other matters more mysterious. After all is over for the day and everybody has retired, I have heard it whispered that there are heard "sounds of revelry by night," supposed by those who study the occult to be the echoes of past Conventions which are loth to lose touch with the present. On the next occasion I hear that I shall be a past master, and allowed to investigate these out-of-focus noises, that I hope give delight but hurt not; unfortunately, however, I also hear that the initiated become for ever dumb, and unable to communicate what they know.

But little of this is really real, or feels so. It is just something on which to hang some good solid enjoyment. It is becoming a truism that no public bodies on this earth are able to manage excursions so well as the Photographic Convention of the United Kingdom. Wet or dry, sunshine or shower, or all mixed, nothing seems to interfere. At Shrewsbury last year the county was at our service. The M.P.'s, mayors, town councillors, town clerks, and clerks of the peace of all the towns, turned out to do us honour and promote our enjoyment. Perhaps one of the prettiest and most delicate attentions was the inauguration of a splendid new flag made for the occasion on one of the grandest castles. When, however, that flag was lowered to suit a picture which was thought of more importance than a sentiment, a gloom was cast over the town. At one town, we did not find the mayor in his municipal array ready to meet us, it was raining, not that I would accuse a proud Salopian of minding rain; somebody had blundered. We sent for his Worship, and all available members of the council were hastily assembled. We lectured them on their duties, and they opened their Town Hall to us, brought out all their treasures, and behaved very well the rest of the day.

Towns welcomed us in our hundreds; M.P.'s luncheoned us, manufacturers turned out their warehouses, decorated them and feasted us; private families tea'd us on their lawns, but we were so true to our art that we always returned to—"papers!"

How comes this? It is not always easy to get two or three to gather together to listen to a paper. The reply is simple. Because our papers do not frighten us; *we haven't got a blackboard!* Nobody wants to explain too much; we have no bores. There is always a fear that in every assembly of men there may be one who won't leave off talking; this kind is rare, but exists. I hope I shall never come across one.

We must not forget we are holiday photographers, and would be even as little children for the time, and treated as such. Give us as much information as may be good for us; let it be digestible, we don't want nightmares. If any member seems inclined to go too seriously into things, to ask "why" too often; to suggest "another way" when his road is straight before him; it would perhaps be well to feel his pulse, or look at his tongue. At the Convention last year there were no invalids of the kind, all were in perfect health, everybody's pulse did "temperately keep time." I certainly saw one model of a shutter come out of a pocket, but it was quietly hushed up, there was no scandal.

I am an official this year, so I must be careful what I write; but, I may, perhaps, be allowed to say that I don't think anything very definite ever comes out of conferences. Yet, it is good to talk things over. There is often more effective work done by three men in a corner than by a solemn meeting, and the Convention affords every facility for all kinds of conferences, from a conspiracy of two to a gathering of a couple of hundreds. There are plenty of good subjects. Here is one, for example: Do any of us know what photography really is? We often hear of it, and some remarkable definitions have been given. The very latest is by one I know to be so admirably conscientious that I am sure it is his honest opinion, and, when high authorities go wrong, it is time means were taken to put them right.

In an article in a contemporary, no less an authority than the Hon. Secretary of the Royal Photographic Society gives his notion of what photography should be. Here it is: "Our idea of progress as photographers is to perfect our existing processes, so far as they may be of value, to become, individually, more skilled in them, and to find new principles and new appliances of old principles, so that new processes may be developed." Then he throws down the glove, and says, "Probably no one will dispute this." Won't they? I dispute it altogether; if I were a vestryman I should say *in toto*.

This is where the mischief lies in experimental chemists mistaking themselves for photographers; an honest mistake, I admit, which has been led up to for many years, still a mistake which is the father of mischief. A still higher authority than the one I have quoted, the present (I think) President of the same society, once defined photography as "painting by light." It may be presumptuous for me to say I entirely agree with so high an authority, but I do. I agree also that it is the business of a photographer, as it is that of every worker in every art, to become more skilled in it, although there is danger in painting the lily and gilding refined gold, but I cannot see what perfecting processes has to do with using them.

A workman may perfect a paint he could not use; it is using processes that is photography; and it is not the business of the "photographer"—the user—to worry around after those elusive "new principles," or multiplying new principles, or resuscitating old ones that have been decently buried. But there is something worse that all this leads to, which seems to be the delight of those who erroneously call themselves photographers, but never photograph; I mean that Ghoul-like proceeding which nearly always happens on those rare occasions when anything useful is brought forward. Somebody whose chief aim in life seems to be to recollect dead processes remembers that the new child had reputed grandparents, and hunts for their forgotten remains; finds and unearths them, and exaltingly shouts, "Look here! this is the real old antique process, the young 'un's an impostor!" I don't accuse Mr. Chapman Jones, for whom I have much respect, and if he will come to the Convention, where all would be delighted to see him, I would argue the matter with him for half an excursion.

In the *Year-Book* five years ago, I suggested that professional photographers should take advantage of the Convention to meet together, and, by way of promoting trade, see what they could do towards *ruling the fashions*, and teaching the easily led public what it should buy. I am delighted to find that it is the intention of the National Association of Professional Photographers to throw in their lot with the Convention this year, or, at all events, take their annual holiday at the same time and place. This ought to afford an opportunity which may not—I mean which I hope will—often happen again, for a large number of photographers to hold a sort of conference within a conference, and doing that which in them lies to promote the welfare of the profession generally. I am quite aware that many deem any attempt at combination quite hopeless; much in the past has taken place to help them to form that opinion, but let us try if we cannot "alter all that." We *are* altering it. Look at the Copyright Union. It is so vast a body that it would not do to invite the unanimous members to Leeds during the Convention,

there may not be room in the town, but I hope we may see some of the leading members.

Of course it does not come within the province of the Convention to take part in any conferences on the business of the profession (it being a body of *photographers only*, without distinction of kind; there are no divisions, nor any labels); but an opportunity of meeting often affords the only impetus needed.

I have individually a strong conviction that the old photography, as seen in show-cases and shop windows, is still on the wane, and that something very different, and, needless to say much better, must follow; also that the coming evolution will be a case of the survival of the fittest. To help photographers to think over this matter I intend to endeavour to collect together a little exhibition of modern photography, to show those who have not seen what is now doing in photography, not only in exhibitions, but in some professional establishments.

The photographic memory is short; does anybody remember as far back as 1879? In that year I went into a photographer's to see his place, and found he had abolished his "nitrate bath." A thing around which, for many years, the whole photographic world revolved, but now unknown to the photographer—although I believe it is still used for "process," and on the beach for taking photograms and low-class sixpenny-worths. The other day I asked at a photographers for some albumenised paper, and was told that he had not possessed any, or any shiny paper for months. Now, the moral is, that before about 1879 portraiture was impossible without a nitrate bath, and now it is unknown, and that albumenised paper is following. I think that here are hints of what is coming.

Now, I don't want to bore photographers into joining us; we want only the jolliest of volunteers compatible with a foundation of earnestness; but I ask any photographer, however imaginative he may be, what better programme for a week's holiday he can suggest than the one the Council has issued, for a five-shilling subscription?

What can the matter be this month? I don't know when to stop, but I must tell you this:—

I know a man who once was not doing well and had plenty of time for a holiday, so he sold his watch and went to a former Convention. In a few days he gained more real practical knowledge than he thought existed in the world The useless theories that had previously filled him were exorcised out of him. The day before returning home he was found on a seat in the town recreation ground in a brooding melancholy. "What is the matter," asked his friend. "I will go home to-morrow," said he, "and it will have to be suicide or dynamite, I didn't know what photography was before." He went home, a divine fury filled him; he destroyed everything in his windows and reception room; started fresh on new lines, and now, instead of not knowing where the next dinner was to come from, he is complaining about how little interest he can get for his investments. Before his awakening, he never read a photographic journal, but I am sure he will read this, for he is now a reformed character, and up to date.

But why tell you anything that the thoughtless may say is romance, when the thing itself is good enough? I expect to see everybody and his wife and all who are worth seeing, at the Convention at Leeds in July, and give this very previous reminder that they may have time to prepare. H. P. Robinson.

BY THE WAY.

The lengthy paper by Dr. Baekeland on the subject of the possible permanence of silver prints does not, I am afraid, add much to our knowledge of the conditions under which we should work in order to secure that consummation, though one or two points are raised which appear fairly open to question. For instance, it is pointed out that developed images are, as a rule, more permanent than those produced by direct printing or "printing out," and, as the particles of silver forming the first-mentioned are coarser than in the latter case, it is suggested that the state of division has a direct influence on permanence. Now, although in the case of silver or any other metal in an extremely fine state of division and unprotected by any other medium or substance from outside influences, the more minute particles might be expected to succumb to such influences more rapidly than the larger, when the silver is imbedded in a protective layer of albumen, gelatine, or collodion, the case is different, and provided the vehicle is thoroughly freed from injurious matter and is also itself of a stable nature, it would seem to me that the more finely divided particles are more completly protected than their larger brethren. Of course, if, from insufficient washing, injurious matter remains shut up in the film, the more finely divided image may be expected to suffer complete destruction more rapidly than the coarser, though the commencement of the action would, perhaps, occur as soon with one as the other. But this does not in any way affect the comparative permanence of properly washed prints.

It is interesting to note that the writer is of opinion that equally permanent proofs may be obtained with any of the vehicles now in general use, or, to use his own words, "it matters little whether it is gelatine, albumen, or collodion," provided, I presume, that proper treatment is given in each case. But it is also interesting to find that, other things being equal, and, in spite of the claims to extra permanence put forward in favour of collodio-chloride, according to Dr. Baekeland, its chances are inferior to those of gelatine, owing to the smaller quantity of silver it is possible to combine with the collodion. His reference, however, to the possible decomposition of the collodion film itself and the disengagement of nitrous vapours will not, I fancy, do much to alarm those who have had any acquaintance with collodion negatives, for these, barring the fragility of the glass, appear to be amongst *the* most permanent of photographic products. That pyroxyline itself will—and rapidly too—give off nitrous fumes is an undoubted fact, but that it does so after its conversion to the condition of a dry pellicle I very much doubt. In the liquid state as collodion it may, no doubt, change more or less; but, if the solvents are pure, not much danger need be anticipated, and I doubt if collodio-chloride prints will give much trouble if the only cause of their fading is to be traced to the decomposition of the pyroxyline.

But Dr. Baekeland does not explain how it is that, in spite of the apparently absolutely permanent character of dry gelatine and the equally suspicious reputation of albumen, gelatine chloride prints do not, in private practice at least, enjoy the reputation for permanency that would seem to be due to them as compared with albumen. We have heard a very great deal during the past few years of the vast superiority of gelatine papers over albumen, and now collodion papers are to supplant gelatine; but the fact remains that albumen paper still keeps its place, and probably will continue to do so—indeed, not a few who have taken up gelatine have had to return to albumen. It is certain that, with an equal amount of care bestowed upon each, albumen prints will be at least as permanent as gelatine, and that, with an equal amount of *want* of care, far more so. So far as these two vehicles are concerned, it may be said that though either will give permanent results when properly treated, gelatine suffers far more in proportion, from carelessness, than does albumen.

The evergreen subject of the colour of negatives and its effect on printing has cropped up once more, and been discussed in all seriousness, as if the actual quality of the print depended upon the colour of the negative, either in its lights or shadows, *as such*. That pyro-developed negatives, exhibiting a certain amount of stain, give, as a rule, better prints than the colourless films produced by other developers, seems to be the general opinion; but it is rather a question of better gradation on the part of the pyro than of colour, otherwise a similar result would be obtained by staining a colourless negative or printing it through a tinted glass. Undoubtedly, there are circumstances under which the latter treatment becomes most useful, but it would be obviously foolish, because yellow glass and slow printing suited one particular negative, to submit to the inconvenience in all cases. That pyro still remains the favourite developer seems to be indisputable, but that it owes the quality of its results to its staining powers I for one refuse to believe; and I think, if an equal amount of study were given to some of the newer agents, they would be found to give equally good gradation with far quicker printing qualities. A quick-printing negative does not necessarily, mean a thin one, and, *per contra*, a slow printer does necessarily yield a print that is rich in silver deposit. That quality depends

entirely on the gradation, and not at all on the mere density of the negative.

Speaking of the colour of the negative naturally suggests thoughts of sulphite of soda, and this again reminds me of a recent editorial allusion to an "amusing reply" to a photographic query in one of the evening papers, in which sulphate of soda was given as an ingredient of this developer instead of sulphite. Without for one moment supposing that the use of that chemical, either in the "reply" or in the "handbook" referred to in last week's JOURNAL, was anything but a printer's error, I would point out that the employment of that salt is not, after all, so absurd as many may perhaps imagine. That it possesses the same properties as the sulphite as a preservative of pyro is, of course, not a fact, but it has its own peculiar characteristics, which may render it a valuable addition to the developer under certain conditions. The late Herbert B. Berkeley first pointed out the fact that the sulphate of soda, in common with many other apparently neutral salts, acts as a very powerful restrainer, and is capable, in a measure, of replacing bromide in the developer. A notable instance of this is to be found in the ferrous-oxalate developer made by mixing solutions of oxalate of potash and sulphate of iron, in which sulphate of potash is formed by double decomposition. This mixture can be used, and will develop with perfect clearness, without further addition of bromide or acid, where the solution made by dissolving oxalate of iron in oxalate of potash would veil the image badly. Some two or three years back a writer in a German periodical recommended the substitution of the sulphate for the sulphite, and where the preservative and stain-preventing actions of the latter are not required it will be quite as useful; in fact, perhaps it will prove to be identical with much of the so-called sulphite that gets into use.

When a member of a photographic society gets up to read a paper, it is usually supposed that he has something to say, and means to say it seriously, but I am at a loss to decide what proportion of the lecture delivered before the Moseley and District Society, reported last week, should be considered as serious, and how much as facetious. That "hydrogen is no bachelor," and that sub-bromide of silver is "a weak maid," are probably new chemical facts, stated in what is intended to be a "funny" way. But when the "no-bachelor" hydrogen joins "the ($2NH_3$) ammonia, and makes another composition of ammonia ($2NH_4$), which subsequently reduces the weak maid, I fancy the lecturer must have lost himself amongst his similes. What $2NH_4$ means, and how it acts upon the sub-bromide of silver, requires some further explanation. If the lecturer had made the uxorious hydrogen go directly to the weak maid without the intervention of any matrimonial agency in the shape of $2NH_4$, he would perhaps have been nearer the mark; but, as it is, I wonder why, to borrow the title of his discourse, he undertook to explain developments.

I should not again have referred to the single-transfer carbon dispute had it not been for M. Demachy's and Mr. Maskell's letters, and only do so now to say that the question is not worth further argument on the lines adopted. I simply said, and say, that true and proper gradation can only be got by transfer, *i.e.*, by development from the back. If the gentlemen named hold that their pictures satisfy the conditions, well and good—they are their own judges, and should he satisfied—My acceptance of Mr. Maskell's challenge would be useless on my part or any one else's, as I don't think Mr. Maskell would be satisfied with anybody else's decision but his own, and that clearly would not satisfy anybody else who thought differently.

DOGBERRY.

PHOTOGRAPHIC WORKERS AT WORK.

IV.—How Messrs. Beck Make a "Frena."

The outside appearance of a Frena and its ingenious method of film changing must be well known to our readers, so that a description of a visit to the works, in which we had an opportunity of seeing the entire operation, and of having the various operations explained to us by Messrs. Beck themselves, is sure to command a certain amount of interest.

The "Frena" cameras and their offshoot, the Frena film-changing box, are the positive outcome of many years' design and experiment, the negative results of which are to be seen in a host of models of discarded appliances and a cabinet full of elaborate drawings and workshop sketches, which were the first thing shown to us. Mr. Conrad Beck told us that, in the course of three years' experimental work, every film-changing principle then known, with one exception, was tried before the Frena was finally adopted and made. In this collection too are to be seen the earlier drawings of the Frena itself, and here a word or two may be said as to the system employed in the factory.

When the general idea of an instrument has been decided upon, its design is got out in drawings, in which every dimension is carefully indicated, and from these drawings a model is made. The model is almost certain to suggest various alterations and additions which are carried out upon it, and then, when the form is finally settled, fresh drawings are made from which the workshop sketches and tracings are obtained. All drawings used in the factory have the dimensions marked upon them, not in inches and fractions as is usually the custom, but in whole numbers representing hundredths of an inch. From the designs obtained in this manner gauges and templates for every dimension of every part are made, the complete set of templates for any one instrument being kept together in one box, a list of them entered in a register and consecutive numbers given to each template, which numbers are marked upon the drawing.

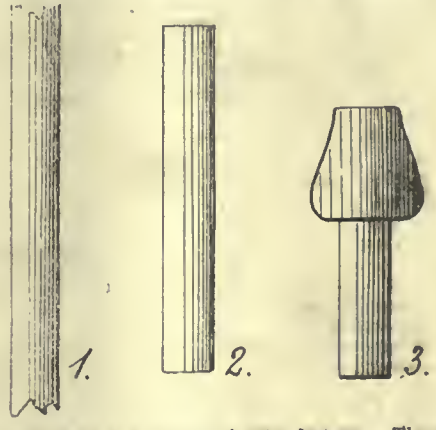
At Messrs. Beck's works everything is regular and systematic, machinery and special tools being used wherever possible. By doing this, by making every part rigidly to gauge, and by making large quantities of each part at a time, the final putting together is largely facilitated, and all the cameras are entirely interchangeable. Over and above all this is the reduction in the price of the finished article which is thus ensured; in fact, Mr. Beck informed us that it would be impossible to make the Frena commercially if this were not done without putting in a cheap lens.

Leaving the drawing office, we first visited the wood-working department. Here the timber is stored for some time before being cut up, after which storage is finished the wood is roughly planed and sawn into the sizes required, the date of purchase and of cutting being stamped on each, and the cut pieces, separated to expose them as much as possible to the air, are kept, where possible, for nine months, to thoroughly dry. This over, they are taken in hand once more, and planed and cut until they are all ready to go together to form the camera case. Space precludes us from describing the various forms of wood-working machinery employed, but one formidable machine was pointed out in which a row of knives, whirling round at a rate of two miles a minute, was cutting the wood quickly and leaving it as smooth and even as could be desired, and sending out a perfect fountain of chips in so doing.

Lightness and strength are the requisites for the timber used in hand-camera making, and to this end American whitewood is exclusively employed in the Frena. To avoid difficulties in the tropics, moreover, no glue is used in putting together.

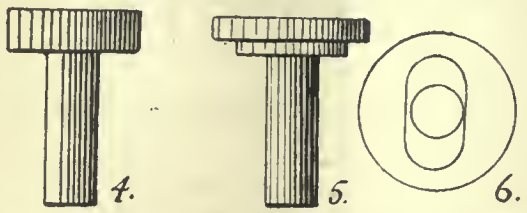
When the whole of the various pieces are completed (and we may mention here that a thousand Frenas are put in hand at a time) the woodwork is fitted together and the leather covering put on, this being done before the metal work is attached to the instrument. The leather employed is imported by the firm; it consists of ox hide, and has a pleasing and distinctive pattern.

Having seen the various operations required to carry the manufacture of the camera thus far, we had our attention turned to the metal work. Here, again, the use of specially designed tools, made for the most part in



the factory itself, is the most conspicuous feature. The whole of the metal parts in the camera are made from sheet, wire, and tube metal, turned and stamped to the form required, not a single casting being used We were shown a glass case in which were displayed the 303 separate

pieces of which each No. 2 Frena is composed, exclusive of nails. Of these 303 pieces, 176 are pins of more or less special design, each form of which is made from brass wire by means of a special tool. The evolution of one of these may be taken as typical of many others, and is seen in the accompanying sketch. The wire which is first shown is submitted to four operations, the first a cutting one, the remainder stamp it until it reaches



its final shape in No. 5, No. 6 being a view of the under side of the head to show the shoulder, the shape of which could not be indicated in No. 5.

The mechanism of the Frena is too well known to call for any detailed description here. Its chief feature is that it carries forty flat films in a pack, which are changed automatically by simply turning a handle, and has, with a reliable adjustable shutter, a really good lens. The box which carries the films, in the first cameras issued, was made of a length of square brass tube, but has now been both simplified, and at the same time is made more economically, by stamping out of sheet metal.

The various metal parts, like the woodwork, are made in batches sufficient for a thousand cameras at a time, and are stored all ready to be put together. The boxes in which they are kept in their respective pigeonholes each have a big E printed on one end. So long as the box is in use, this end is turned next the wall, so that the E is not visible; but, when empty, the box is turned with its other end inwards, so that the E is seen, and the state of the stock of any particular fitting can thus be ascertained at a glance. The actual putting together, in consequence of each part being accurately made to gauge, is a very simple affair, the adjustment of the fixed focus lens being the most interesting portion. This adjustment is made by sliding the film-holder in the framework that carries it in or out until the correct position is ascertained, when it is fixed once for all by three screws on each side. To do this, the camera is clamped securely on a wooden stand, the film-carrier and its bearings being attached to a framework carrying an eyepiece magnifying forty times; this framework, and consequently the film-carrier, can be moved farther into or out of the camera case carrying the lens by a lever, a large movement of which shifts the framework but slightly, and so a very nice adjustment is possible. With this magnifier, using as an image on illuminated grating at a certain distance down the shop, the exact relative position for the lens and sensitive surface is ascertained, and before the camera is released from the apparatus this position is ensured once for all by the screwing up of the three screws on each side already referred to.

The camera, having been put together, has to be tested, which is done in a particularly thorough manner. No camera is allowed to leave the works until, in addition to a photograph being taken with it, every part has been distinctly examined and certified to be in the right condition. To ensure this, the tester has to fill in a form giving the number of the camera, date of testing, and signature of the person carrying it out, which form has to be marked for each particular examined. As an example of the exhaustiveness of this test, we cannot do better than reproduce that part of the test sheet which refers to the film-holder only, the other fittings, the shutter and the camera generally, being dealt with in a similar manner.

Holder.	
The blind tight	
,, ,, properly fastened	
Swing back easy	
Gravity latch acts...	
Holder correct size	
,, square	
,, vertical	
,, pins correct length	
,, fits between sides	
,, burrs removed from inside	
Pressure board and spring flat	
Sliders travel full extent...	
Indicator correct	
Handle parallel with top of case	
,, level sound	
,, easy with forty films	
Forty films passed through	

It is only when the camera has thus been tested in every particular, and a photograph taken with it, that it is ready for the market, and the negative and record of the test is filed.

So far, we have seen the wood and metal work made; one of the most interesting parts of the firm's manufacture has still to be seen, we refer to the lens-grinding shop, which we were next shown, giving a glance by the way at the ten-horse gas engine, which is the motive power of the factory, and a shed in which the operations are carried out which impart that fine dead black to the brasswork which renders it so attractive and at the same time reduces awkward reflections to a minimum. We cannot also do more than allude to that part of the works devoted to the manufacture of other optical instruments, since the interest of this article centres round Frenas.

In the lens-grinding department are to be seen lenses in all stages, from the rough slab of glass as it comes from the glass works to the finished and mounted objectives, which latter range in size from parts of microscopic objectives about the size of a pin's head to telescope lenses several inches in diameter. Our appreciation of the rough-looking slabs of glass is much increased when we hear that their price ranges up to as much as 2*s.* 8*d.* per ounce; much of the glass employed, particularly the more expensive varieties, has to be obtained from the Jena factory. The operations of manufacture consist of a rough grinding to approximately the shape required; in some cases the glass itself is supplied moulded to the form required, and, this first operation avoided, the roughly shaped, however obtained, is then gradually carried finer and finer until the lens is ready for polishing.

It seems of the simplest possible nature, but we are told that it requires years and years of practice before a man acquires that delicacy of touch or knack by means of which the grinding tool curved to the form required is kept moving irregularly over the face of the work, so that the pressure is even over the entire surface and the curve desired is obtained. Machine work here is out of the question, human skill being the only means by which each lens can be satisfactorily made. In this department the Frena lens, which we learn is by far the largest item in their cost, and the Frena "magnifiers" or supplementary lenses, are made and tested, the latter operation being carried out so completely that no less than eleven tests are made of each lens before it leaves the department to be inserted in the camera.

More, a great deal more, could be said about the many interesting operations which are carried on at Messrs. Beck's factory. Exigencies of space have compelled us to pass over the Frena film-carriers, telescopes, microscopes, and many other instruments which are made here. In fact, the two or three hours spent by us, here could easily have been extended to four or five times that length without exhausting the sights which appeal to and interest photographers. We are compelled, however, to omit the description of much even of what we did see in that time, and to strictly limit this article. We can only conclude by recording our obligations to Mr. Conrad Beck, Mr. William Beck, and Mr. Horace Beck, for the trouble to which they put themselves to enable us to lay before our readers some account of how they "make a Frena."

ASTIGMATISM AND A NEW "STIGMATIC" LENS.*

In the first place, the simplest form of a stigmatic lens consists of a glass plate with parallel plane sides. Since, however, such a lens has an infinite focal length, we must modify this lens in such a way as to obtain a positive focus without altering the astigmatic constant. There are three principal methods to proceed by (fig. 4).

(1.) Let us divide the glass plate into two lenses by means of a curved surface and then separate these lenses. In all cases, by so separating the lenses, we shall at once obtain a positive focus, depending on the amount of the separation. This separation, as we have seen, has no effect on the astigmatic constant, and thus our first method consists in the use of strong positive and negative lenses separated by considerable intervals.

(2.) Let us suppose the surfaces of the plate to be, instead of plane, equally curved. In this case also we shall obtain a positive focus depending on the thickness of the plate, with, at the same time, zero astigmatic constant. More generally if we have two meniscus lenses with equal external curvatures, but one thick and the other thin, the astigmatic constants of the two will be the same, but the thicker lens will have the shorter focus, and consequently the thick meniscus has smaller astigmatic constant proportionally to its focal length. Our second method is, therefore, the employment of *thick* meniscus lenses. This method, in reality, closely resembles

* Continued from page 264.

the first; there we have converging and diverging lenses, separated by a considerable interval, and here converging and diverging surfaces separated by an interval.

(3.) If we make up our glass plate of a crown-shaped lens of high refractive index, and a flint-shaped lens of low refractive index, we shall also be able to obtain a positive focus with zero astigmatic constant. On account of the different factors by which, as I have said, the thicknesses of lenses of glass of different refractive indices must be multiplied, it will be found that this form of lens must be actually thinner in the centre than at the edge to give zero astigmatic constant, though at the same time it will give a positive focus. On the other hand, with a (thin) lens made up of a crown-shaped lens of *low*, and flint-shaped lens of *high*, refractive index, to get zero astigmatic constant, the thickness in centre will be slightly greater than at the edge, but at the same time the *focus* will be negative.

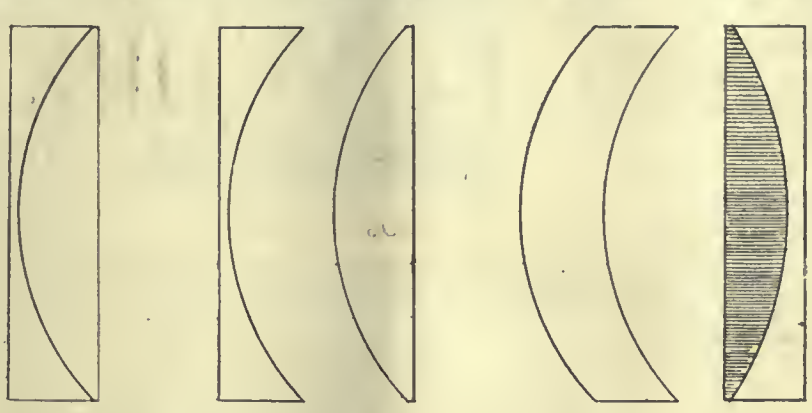


FIG. 4.

It will perhaps be of interest to discuss some lenses which exhibit these types of correction. With respect to our first principle, the old triplets of Dallmeyer were an example of its partial employment, and these lenses are still well known for their flatness of field. Lately we have, of course, had a lens in which this principle has been more fully carried out. There is also a very old instance in which this principle was very fully employed, of which I shall give you a detailed description, as I believe it is not very well known. A year or two ago, while looking over some old photographic papers, I came across some old experiments of Professor Piazzi Smyth, then Astronomer-Royal for Scotland. Piazzi Smyth wanted a lens working at *f*-3 with a flat field free from astigmatism. He found, as we all know, that by shortening the tube of his portrait lens he could get rid of the astigmatism, though at the same time introducing a great deal of curvature of field. He then cast about for some means of getting rid of this curvature of field without introducing astigmatism. He found that he was able to do this by placing a strong negative lens just in front of his sensitive plate, and, since the reasoning by which he arrived at this construction is interesting, I shall here give it. These experiments were carried out in the old collodion days, and, since Piazzi Smyth was exposing his sensitive plate while actually in the bath, he had to put a glass plate in front of the plate to prevent the liquid from spilling. Finding that this plate had the effect of slightly lengthening the focus of his portrait lens, and the more so the thicker it was, he at once argued that if he used a plate of varying thickness, in fact one that was thicker at the edge than in the centre, he should be able to lengthen out the marginal rays, and so obtain a flat field without astigmatism. You will at once see that this is merely an application of my first principle; we have here a strong negative lens as far removed from the positive lenses as possible, and, further, the proper curvature of the "corrector" lens can be at once determined by the fact that it must be as much thicker at the edge than at the centre as the lenses of the portrait are thicker in the centre than at the edge. I have here a portrait lens with a properly curved field and its corrector lens by which I can at once show the feasibility of this plan.

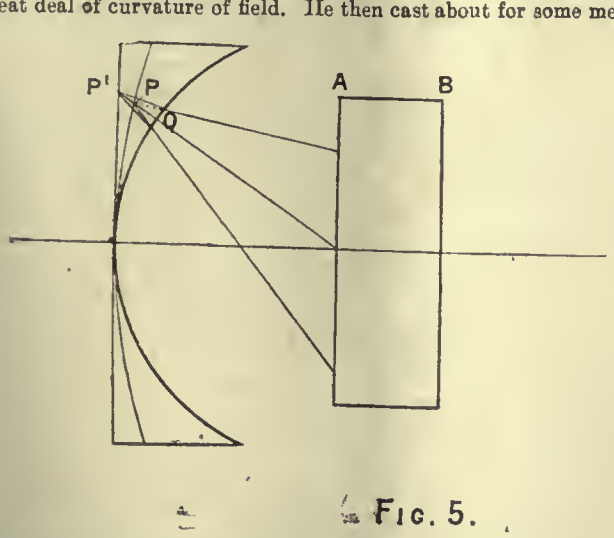


FIG. 5.

By drawing a figure showing the path of the rays it is easy to see how this flattening effect takes place (fig. 5). The curvature of the deep side of the corrector lens must be about three times the curvature of the field, consequently the marginal rays meet the surface of the corrector lenses sooner than the central rays, and are thus more lengthened than the central ones; thus, in previous figure, μ being refractive index and r radius of curvature of curved face of corrector lens—

$$\mu\left(\frac{1}{P^1Q} - \frac{1}{r}\right) = \frac{1}{PQ} - \frac{1}{r}$$

or

$$\mu\,\frac{r - P^1Q}{P^1Q} = \frac{r - PQ}{PQ}$$

or nearly, since P^1Q PQ are very small

$$\frac{\mu}{P^1Q} = \frac{1}{PQ}$$

Now curvature of image : curvature of face and lens

: : P^1P : P^1Q

or as $\mu - 1 : \mu$ or approximately 1 : 3.

The thick aplanats of Steinheil (and the similar lens known as the portable symmetrical of Ross) also the Steinheil antiplanats and the Zeiss and Goerz anastigmats really come under the second type of correction.

Under the third type of correction we have the anastigmat of Hartnack, and the "Concentric" of Ross. As before pointed out, lenses of this type have to be actually thinner at the centre than at the edge. The Zeiss and Goerz anastigmats, properly speaking, do not come under the third head at all, for, though they contain crown lenses of light refractive index, they also contain crown lenses of low refractive index, the two nearly neutralising one another.

Having thus dealt with the question of astigmatism, it now remains to take account of spherical aberrations, or the aberrations which show themselves when we are dealing with pencils of finite size. For the reasons I have already set forth, I shall now consider only rays of pencil which lie in the primary plane, *i.e.*, the plane containing the radiant point and the axis of the system.

In the first place, there are really two conditions for complete aplanatism for an optical system, and not one, as is usually stated, though only one of these appears for large pencils, whose radiant point is on the axis of the system—the form of spherical aberration in primary plane, which only appears for large pencils whose radiant point is not on the axis of the system, giving rise to the effects usually known as "coma."

Referring to our former figure, we see that, in the large pencil from P incident on the system, the refraction of the two halves of the pencil separated by the principal ray is exactly the same, and consequently only one condition for aplanatism arises, whereas in the large pencil from Q the refraction of the two halves of the pencil is dissimilar, and consequently we obtain two terms (which have each to be made zero for aplanatism) in the spherical aberration of such an eccentrical pencil. Further, if all the rays from an extra axial radiant point Q (in primary plane) after refraction pass

through one point, Q_1^1, it is evident that the primary curvature of the system is independent of the position of the small stop, R. The converse of this is also true, *i.e.*, if we investigate the condition that the primary curvature shall be independent of the position of the stop, we obtain two conditions which are in fact the conditions for freedom from (what are usually termed) spherical aberration and coma. But, since there is also the question of distortion to be considered, I prefer to attack this question in a different sort of way. On account of spherical aberration and curvature of field, the distortion of the general optical system depends in general on the position of the small stop, thus (fig. 6).

As in our former figure, let P^1Q^1 be the conjugate plane of PQ. Let QR be a ray from a point Q on the object, passing through a small stop at R, suppose this ray after refraction meets the conjugate plane at Q^1; let N_1 N_2 be the first and second "nodal" points of the system; draw N_2Q^{11} parallel to N_1Q meeting the conjugate plane in Q^{11}. Now, distortion consists in change of scale in different parts of the image. According to the Gauss theory the scale of image: object for parts of image *near* to axis is P^1N_2: N_1P or P^1Q^{11}: PQ. Now, the point on the image corresponding to Q is plainly Q^1. Hence, we may take Q^1Q^{11} as a measure of the distortion with a small stop at R. An expression in perfectly general terms can be obtained for this quantity, Q^1Q^{11}, and we shall find that, if this quantity is to vanish for all positions to the stop R, that we must satisfy four conditions amongst the constants of the optical system. Two of these conditions are the same as those already mentioned for freedom from spherical aberration and coma, a third is necessary that the curvature in primary plane should vanish, if these three conditions are satisfied, the distortion is constant for all positions of the stop, R, and a further condition must therefore be satisfied if this constant value of the distortion is to be zero. There is also the condition that the astigmatic constant shall vanish, and three conditions for complete achromatism, in all eight conditions to be satisfied by an optical system free from all spherical and chromatic aberrations, curvature of field, astigmatism and distortion. The conditions

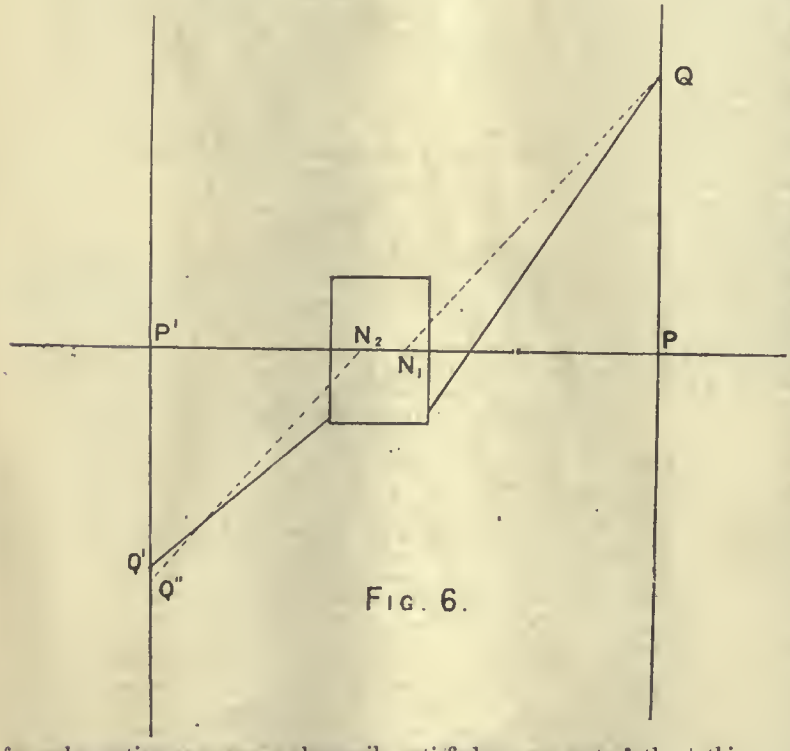


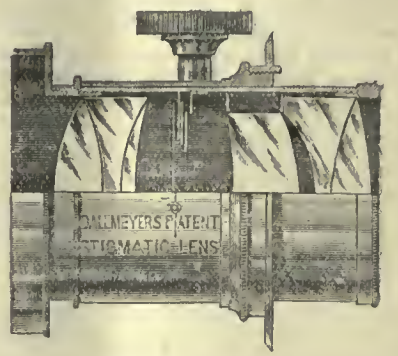
FIG. 6.

for achromatism are, as a rule, easily satisfied on account of the variety of glass with same refractive indices and different dispersions now at the disposal of opticians. My method, then, of constructing such optical systems is to write down the above conditions in general terms, and treat them as equations for determining the curves, and thicknesses, and separations of the lenses of the system.

The first lens that I have worked out by these principles is here figured. It resembles in general form the type of portrait lens introduced by the late J. H. Dallmeyer in 1866. The chief points of difference are:—

(1) That the back combination is a weak negative lens instead of a positive lens.

(2) The refractive indices of the cemented lenses forming the front combination are all high, and nearly equal. The back com-



bination is formed of crown-shaped lenses of high refractive index, and flint-shaped lenses of low refractive index.

(3) The front lens is an unusually deep meniscus.

H. L. ALDIS, B.A.

THE TONING OF BROMIDE PRINTS.

A MINOR department of practice, which may be safely left for attention when days are dull and clients few, is the resuscitation and rejuvenation of faulty bromide proofs.

In exposing and developing a dozen or so of bromides, it is very rarely indeed that a percentage of more than eight out of twelve turn out really good and fit without further treatment. If, however, we thoroughly fix, wash, and dry the remainder—treat them, in fact, as if they were just as perfect as the others—we shall often find it worth our while at some leisure time to devote a few minutes to them, for it often happens that out of this lot of faulty wasters we can get one or more prints which really may surpass the first and selected prints in tone and brilliance. In other words, the ugly duckling may develop into a swan of wonderful plumage.

It is never too late to mend a poorish bromide provided it has been properly *fixed* and *washed*.

I lately found, in a most unexpected place, a roll of bromide prints, 15 × 12, which, I should think, were at least seven years old—wasters presumably, and yet had evidently been stored away carefully, in the hope of a time coming when something could be done with them. They were a find in their way, being the sole remaining prints of a medal negative which had some time ago gone over to the majority.

The prints were badly stained (iridescent stains), inclined to be mouldy, had some symptoms of light fog, but were fully developed—had been developed with ferrous oxalate—and were of a greenish tinge far from pleasing.

A glance through the JOURNAL in search of information bearing upon the subject was, of course, useful, inasmuch as a variety of formulæ was very quickly discovered.

It is clear that nothing can be done of any value if the fixing of the print has been imperfect, or if the washing has not resulted in a complete elimination of salts. The first thing to be done was, in the absence of any confidence in what had gone before, to once more *fix* these prints and wash them. This was done, and they were ready, after drying, for further treatment.

To tone or intensify—for that is usually what it amounts to—is never to be done in the absence of a really effective clearing bath. The surface of a bromide print—or any other film for that matter—is never in a good condition for this operation, unless it has a mild, but effective, sort of "shampoo process," which leaves it in the best possible condition to receive the action of the toning salts.

From the appearance of the stains and fog, Howard Farmer's reducer was instantly judged to be the best "clearing" agent for this purpose. For my own part, I very rarely intensify without first submitting the film to the action of this excellent bath, and in the present case the prints were, as may be expected, greatly improved. The iridescent stains cleared off, the light fog dispersed; but in one case, that of a print not so fully developed out as the others, it was cleared at the expense of the high lights, which then had rather a chalky appearance. A second washing followed, using

gentle friction with wet wool at intervals, to completely clean the surface.

Three toning baths were used:—Firstly, the alum and hypo bath of the Eastman Company. Their formula is as follows: Sodium hyposulphite, ten ounces; dissolve in three and a half pints of boiling water, then add gradually one ounce of powdered alum. This bath was made and kept some days before use. It was then warmed to 100°, and two prints immersed therein. They took quite thirty-five minutes to tone, and were distinctly the better for the treatment. There was rather more reduction of density with this bath than I expected; but, as the prints were quite over-dense to start with, they were all right in the end. The prints were placed after toning in a simple solution of alum (three-quarters of an ounce to the pint of water), then washed and dried.

The second lot were toned with uranium, *e.g.*:—

Mix freshly—

Red prussiate of potassium	4 grains.
Water	4 ounces.
Glacial acetic acid	150 minims.
Water	4 ounces.
Uranium nitrate	4 grains.

The prints were not *immersed* in the above, but, having been wetted thoroughly and attached, face up, to a piece of plate glass, the solution was applied by means of cotton-wool, the whole of the face being well and carefully attended to. Toning proceeded so slowly with this bath that I added a few drops of ordinary "mercurial intensifier" (the usual five per cent. solution), and got, in a few minutes, a very nice *dark oak* tone, which admirably suited the subject. By *surface* toning, the risk of staining, degradation of the whites, &c., is reduced to a minimum, and washing, though thorough, need not be prolonged.

The best results were, I think, got by means of the method suggested, I believe, by Mr. Chapman Jones, viz., bleaching with mercury and redeveloping. For this purpose, a fresh bath of mercury bichloride was made, one part in forty of water. Bleaching in this diluted bath proceeds slowly, steadily, and *evenly*. *Thorough* washing follows. This is once more *essential*, otherwise development will be local and patchy. Redevelopment is effected with eikonogen, amidol, hydroquinone, or ferrous oxalate, but the solution must be moderately weak, the chloride image being very easily reduced. On the whole, the results were better with this method, but merely on *accidental* grounds. The few small, mouldy patches showed up less with this operation than with either of the others, and these, after mounting, were more easily obliterated with the pencil. The operations of redevelopment, &c., may be carried out in daylight. The prints are to be washed and dried

It is quite clear to me, as the result of these few trials, that, with a little more care, a much higher percentage of successes in bromide printing would result. Let the prints be made the best of at the time, then thoroughly fix, wash, and dry the lot; but do not reject, without a trial and due consideration, those which may be below the mark, for something may be made of them. J. Pike.

PHOTOGRAPHY WITH THE BICHROMATE SALTS.

The third of the series of lectures upon this subject, organized in connexion with the Affiliation of Photographic Societies, was delivered on April 24, by Mr. W. E. Debenham, the subject on this occasion being *Collotype*. There was a larger attendance than at the previous lectures, about fifty persons being present. Having sketched the principles upon which the process depends, Mr. Debenham gave a demonstration of the same, entering very fully into the *minutiæ* of Albert's method, from the cleaning and grinding of the glass plate to the pulling of proofs in the press. The formula recommended for the first coating, to secure the adhesion of the sensitive film to the printing surface, was as follows:—

Water-glass (silicate of soda)	1 ounce by measure.
Beer	15 ounces ,,
Caustic soda	30 grains.

The caustic soda was not always used, but was desirable if the beer was in the least degree sour; ordinary "four-ale" was frequently used, but Pilsener beer was to be depended upon for the purpose. The solution required repeated filtration, and every precaution must be taken to prevent the formation of bubbles or froth. The second, or sensitive, coating was made by swelling an ounce of middle-hard gelatine in water, straining off the water, adding 2 ounces of a ten per cent. solution of the bichromates of ammonia and potash, 1 drachm of ammonia, and a little chrome alum (the latter fulfilling the double purpose of hardening the gelatine and forming a grain), and making up the whole to 12 ounces. The plate having been coated was placed in the drying oven to dry, the proper temperature being 120° to 130°. The lecturer then referred to the preparation of the negative for printing, the exposure and subsequent washing out of the soluble salts, and proceeded to explain the details of the printing in the press. There were, he said, two or three methods of printing, one being simply to damp the plate, as a lithographic stone is damped, dabbing the surface until no shining spots of water remained, and then to begin to ink. The usual method, however, was to pour on the film a so-called etching solution, which was allowed to act for a few minutes, and which consisted of glycerine, 5 ounces; water, 3 ounces; and salt, 1 drachm. White spots on the collotype plate might be remedied by touching them with Indian ink ground up in a solution of tannin. Mr. Debenham concluded by saying that he believed this to be the best method of photo-mechanical printing; block printing was now done exceedingly well, and could be produced much cheaper than collotype; but for the true rendering of nature, without loss of detail or gradation, he thought there was no process to equal the latter.

Friday, May 1, *Photography and Photo-zincography*, by Mr W. T. Wilkinson. Syllabus.—Requirements of a photo-litho transfer; the paper; sensitising the paper; the negative and exposure to light; inking up the print; development; use of various colloids; direct method on zinc; half-tone photo-litho; collotype grain; screen grain; photo-zincography in line; the negative; preparing the metal; printing, development, and preparing for etching; half tone; the negative, printing on zinc in albumen and fish glue and on copper.

(*To be continued.*)

CAMERA CLUB CONFERENCE.

The eighth annual Conference of the Camera Club was opened at the Club House, Charing Cross-road, on Monday evening, the 27th inst., by Captain W. de W. Abney, who, at the annual general meeting held in the previous week, had been re-elected President of the Club. The exhibition of members' work, which is held contemporaneously with the Conference, includes a number of excellent examples, but on Monday evening the hanging appeared to be unfinished, and a catalogue was not easily discoverable. Captain Abney, in formally opening the Conference, thought there was reason for congratulation in the fact that the meetings were to be held in the Club's own premises, rather than in the less convenient rooms of the Society of Arts, as had been the case on previous occasions, except the Conference of last year, and that it had been arranged to hold no afternoon meetings.

Lord Rayleigh gave an account of his experiments in

The Reproduction of Diffraction Gratings

by photographic means. At first sight, he said, it would appear to be a comparatively simple matter to make a grating upon a large scale and reduce by photography, but, if one went into figures, this method was not so promising as it looked, for a grating of 10,000 lines to the inch magnified 1000 times, so that there were ten lines to an inch, a convenient size, would require the wall of a cathedral to hold it. There was no simpler or better plan than to copy the original—ruled by a dividing machine—by the process of contact printing, and for this purpose the best support for the sensitive surface was optically worked glass, as very close contact was necessary, although selected pieces of ordinary plate would enable one to obtain good results. The old albumen process was very useful on account of the almost complete absence of structure in the film, and because the hardness of the surface rendered the result comparatively little liable to injury; he had also used with success the dry-collodion processes, particularly the tannin method, and some of the direct printing processes, such as the collodio-chloride, which, worked upon glass, gave excellent results. In the latter case, considerable advantage accrued from treating the finished print with mercury in the manner commonly used for intensification, except that the treatment should stop with the mercury, and not go on to the blackening. The grating after bleaching appeared much less intense than before, but the spectra became very much more intense. More than twenty years ago he obtained very good reproductions by the bichromated gelatine method. The performance of photographic copies was quite equal to that of the originals, except where there was some obvious defect, and, in respect of brightness, it not unfrequently happened that the copies were far the brighter, although, if anybody was anxious to make him a present, he would prefer to have an original. In order to do anything like satisfactory work with diffraction gratings, it was necessary, not only to have a very great number of lines, but to have them spaced with extraordinary precision, and wonderful success had been attained by means of the beautiful dividing machines of Rutherford and Rowland; uniformity of temperature must be carefully maintained, as the slightest expansion or contraction would bring the grating and its resulting spectrum to utter confusion. A grating upon speculum metal, although excellent for use, was not easily reproduced, but he had, to a certain extent, succeeded in copying one. He had recently endeavoured to copy diffraction gratings by the bitumen process, with which it was necessary to give two hours' exposure to sunlight, and to develop with turpentine, but he had not succeeded in finding a means of getting rid of the turpentine without causing disintegration of the film.

Lord Rayleigh passed round for examination several copies of gratings, and in the course of the subsequent discussion some suggestions were made for the removal of the turpentine used for development in the bitumen process. Mr. Pringle suggested spirit of wine, and the Rev. F. C. Lambert proposed oil of lavender, but Lord Rayleigh said he had succeeded best by washing in a strong stream of water.

Mr. Leon Warnerke referred to the possibility of making a mould of a grating in Spence's metal, which would yield an impression of a greasy finger tip.

The Earl of Crawford said an impression of breath upon glass could be made in Spence's metal, but to properly use that material it was necessary to keep it at a particular temperature, which was not easy, and the metal was not now obtainable. The discussion was continued by Messrs. J. W. Gifford, R. Child Bayley, Charters White, and others, and closed by the President.

(To be continued.)

THE W. H. HARRISON FUND APPEAL.

	£	s.	d.
Amount already acknowledged	45	16	0
A Photographer	2	2	0
Joseph Swinburne, Esq.	2	0	0
Sir Chas. Isham, Bart.	1	0	0
A. E. W....		10	0
J. Ellerthorpe, Esq.	1	1	0
Members of the Brixton and Clapham Camera Club —First donation	2	2	0
	£54	11	0

Further contributions will be thankfully acknowledged by
FREDK. H. VARLEY, 82, *Newington Green-road, London, N.*

The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

CARBON PRINTING. (To J. C.).—A negative suitable for gelatine and collodion is absolutely unadapted for carbon printing, being much too thin, in consequence, of course, giving a very weak print, or, if over-printed, a flat, heavy one. In fact, collodio-chloride, which J. C. says give him good brilliant prints, is generally recommended as giving good prints from negatives which are much too thin for any other process. Carbon requires a rather particularly plucky negative, as J. C. would know if he had studied his text-book instructions, indeed it will stand a greater amount of contrast than any other process in which I have had experience, albumen coming next on the list, then hot-bath platinotype, then cold-bath platino., then gelatino-chloride, and then, as a last resource, collodio-chloride.—W. BENINGTON.

CHLOROPHYLL. (To W. H. G.).—I have known chlorophyll to be effective when applied as a bath to gelatine emulsion plates and followed by immersion in water, but its action is very uncertain. It can be made always effective by flowing the plate with a strong alcoholic solution, draining and *drying*, then immersing for a minute in distilled water. This method succeeds with all colour-sensitisers not perfectly soluble in water. But I cannot recommend chlorophyll for use with gelatine dry plates even when applied in this way; cyanine is better.—F. E. IVES.

DARK ROOM FOR DEVELOPMENT.—B. G. DAVIS says: "I should be much obliged if either you or your readers could inform me of any place where, by means of a small subscription, I could develop any photographs that I should require. I am aware that a great many makers of cameras have dark rooms for the use of their customers, but they all close at 6.30, which is too early for me."—Some correspondent may be able to supply the desired information.

Our Editorial Table.

THE ADAMS TELEMETER.

Adams & Co., Charing Cross-road, W.C.

THIS is a simple device for enabling a hand camera worker to judge of the distance of an object he is photographing. In use, the telemeter is held (as shown in the illustration) close to the eye. The tube through which the eye looks is pointed to the base of the object, towards which the eye is directed, and, as soon as the object



is sighted, the spring is pressed by the thumb. This fixes the indicator, and the distance in yards may then be read off. We have subjected the telemeter to test measurement, and find it accurate.

THE WELLINGTON FILM.

Wellington & Ward, Elstree, Herts.

THE Wellington Film makes its appearance at an opportune moment. Readers of our pages during the last twelve months will have noticed that we published communications from several correspondents pleading for the reintroduction, at the hands of manufacturers, of suitable paper coated with gelatine emulsion, for negative purposes. The Wellington Film may, in many respects, be accepted as an answer to these requests.

The characteristics of the Film are such as will probably attract considerable popularity to it, for we may say at once, as the result of the few trials we have so far been able to make with it, that it is exceedingly easy to manipulate. It may best be described as a fairly stout film of gelatino-bromide, supported by a paper backing, from which, after development, it is readily stripped by the mere device of turning back a corner of the film from the support and gently drawing it off the paper. Nothing could be simpler. Where stripping is not desired, however, the backing may be allowed to remain and the negative printed from as were the paper negatives of a decade ago.

In use: Pyro ammonia for normal exposures and amidol for instantaneous work, are recommended. The alum bath and a fixing solution of plain hypo are also advised. Here are details of the other manipulations:—

WASHING.

On removing from the fixing bath wash in running water for at least one hour.

SOAKING BATH.

On taking the negatives from the washing water, immerse them for a few minutes (five to ten) in a bath composed of:—

Formalin (40 per cent.)	3 drachms.
Glycerine	2 „
Ammonia, 880°	1 drachm.
Water	20 ounces.

The addition of ammonia renders the film more adhesive to the glass plate during drying. A further increase in the quantity of ammonia tends to expand the film, the action taking place after the film has been stripped off, and, if allowed to remain in solution, this may be advantageous in the case of over-development; by this means an enlarged negative of good printing density may be obtained.

STRIPPING.

The stripping may be conveniently started by rolling one corner between the finger and thumb. Pull off the transparent film from the paper backing evenly and gently, and, after a momentary immersion in the soaking bath to wet both sides, transfer direct therefrom to a glass plate (which has been thoroughly well cleaned with ammonia, whiting and water), and when quite dry dust over the surface a little powdered French chalk, polishing off lightly with a dry cloth. Ferrotype plates are not recommended, as the films have a tendency to peel off these during drying. Lay the film carefully hereupon, avoiding air bubbles. Do not squeegee, which is likely to distort the film, but carefully drain and allow to dry *slowly* in a *cool* place; on *no account* expose the drying film to the hot rays of the sun or to artificial heat, otherwise the film may become detached from the plate in the course of drying, thereby producing a wrinkled and cockled film.

When dry, the film may be removed from the glass plate by lifting up the corner of the film with the point of a knife, and it will be found to be perfectly plane and smooth.

Varnishing.

For the prevention of silver staining as well as to obviate any of the evil effects of dampness, the dried film may be conveniently varnished by dipping bodily into any suitable varnish which requires no heat. Sufficient varnish should be poured out into a flat dish into which a single film should be immersed; carefully drain it by slowly lifting, and pin up by one corner to dry.

We shall be surprised if the Wellington Film does not come into very general use. It is issued both as a cut film and in the rollable form. Of the latter we hope to speak, together with others of Messrs. Wellington & Ward's new introductions, on a future occasion. In the meanwhile, Messrs. Wellington & Ward may claim to have made a useful and practicable addition to the photographer's resources.

The Paget Prize Collodio-chloride Paper.

The Paget Prize Plate Co., Watford.

We have received samples of the latest make of the Paget Company's collodio-chloride paper, of which two kinds are issued, the one coated on Rives, and the other on Saxe paper. The "special C. C." is intended for professional use, and is not supplied in shilling packets. Both papers appear to be all that is desirable in a printing surface of this description, and, having regard to the charming results obtainable and the comparative ease in working it, we are not at all surprised to hear that the paper is growing in popularity.

News and Notes.

We learn that Mr. A. L. Henderson attended at the Grand Hotel, Cimiez, on April 20, to receive Her Majesty's commands.

Hackney Photographic Society.—Elementary course.—During the months of June and July a series of elementary lectures will be given by Messrs. E. J. Wall and W. E. Debenham. Subjects: Lighting; Focussing; Exposure; Development; Fixing; Intensification and Reduction; Defects in Plates; Printing.

Mr. E. Willitt, of 168, Cowley-road, Oxford, writes: "May I beg the insertion of this letter, as it may prove a caution to others? A heartless scamp, to whom I had entrusted an Optimus camera, four metal slides, a 12×8 and 8×5 rapid rectilinear lens (the latter without stops), and 7×5 wide angle, has disappeared with them, stripping me of my means of living. Should any photographer be favoured with a call, I trust they will call in police aid, in whose hands I have placed the case."

Hackney Photographic Society.—A popular lecture and demonstration of the Röntgen rays, the New Photography, will be given at the Morley Hall, Hackney, on Thursday, May 7, 1896, by Mr. J. E. Greenhill. Syllabus.—Light: General properties, visible spectrum, invisible spectrum, action on certain salts, photography, fluorescence. Electricity: High-pressure discharges, discharge in air, in moderate vacua, in good vacua, in high vacua, anode effects, cathode effects, comparison with ordinary light phosphorescence, radiant matter, light, radiometer, electric radiometer, heat radiometer, mill-wheel experiment. X Rays: Theories concerning, comparison with ordinary and cathodic rays, action on certain salts, photography, transparency. Kryptoscope: Dependent on fluorescence, penetration of the X rays. The whole subject will be fully explained, demonstrated, and results shown by means of optical lantern. Many of the experiments will consist of photographing through opaque substances, such as wood, leather, and vulcanite, &c., and of the bones through the living flesh. The chair will be taken by Mr. E. J. Wall, F.R.P.S., supported by local medical gentlemen.

Patent News.

The following applications for Patents were made between April 15 and April 22, 1896:—

Kinetoscopes.—No. 7801. "Improved Apparatus for Obtaining and Viewing Chromo-photographic or Zoetropic Pictures." Communicated by Auguste Lumière and Louis Lumière. B. J. B. Mills.

Photographic Apparatus.—No. 7809. "Improvements in or relating to Photographic Apparatus." Complete specification. G. R. Sanson.

Chrono-photographic Apparatus.—No. 7817 "Improvements in Apparatus for Taking, Developing, and Exhibiting series of Photographs." J. Oulton, W. Shaw, and R. H. Adams.

Changing Boxes.—No. 7846. "Improvements in and relating to the Changing Boxes of Photographic Cameras." R. Dobson.

Mounting Photographs.—No. 8143. "Improvements in and relating to the Mounting of Photographs and other Pictures." S. Delépine.

Meetings of Societies.

Meetings of Societies for Next Week

May.	Name of Society.	Subject.
4.....	North Middlesex	Informal Meeting.
5.....	Brixton and Clapham	*A Visit to India and Burma.* Dr. C. Wyman.
5.....	Gospel Oak	Carbon Demonstration. The Antotype Company.
5.....	North Surrey	Toning and Fixing of Gelatine Chloride, and other Printing Papers.
5.....	Wolverhampton	Members' Lantern Evening and Competitive Exhibition.
6.....	Borough Polytechnic	Flashlight Photography.
6.....	Croydon Camera Club	Third Annual Rummage Sale.
6.....	Edinburgh Photo. Society	*The Hand Camera.* Charles Fraser, and others.
7.....	Darwen	Enlarging Demonstration on Elliott & Sons' Bromide Paper. Messrs. Holden and Cooper.
7.....	London and Provincial	*The Position of the Affiliation Committee.* P. Everitt.
8.....	Bournemouth	Annual General Meeting.
8.....	Ireland	*Odds and Ends.* J. H. Gane.—*The Zeiss and Taylor Lenses.* Professor Scott.
8.....	West London.....	*Photography and Cycling.* J. Stein.
9.....	Borough Polytechnic	Excursion: Worcester and Ewell.

London and Provincial Photographic Association.

April 23,—Mr. T. E. Freshwater in the chair.

Mr. W. D. Welford passed round for examination two of the Continental exhibition medals.

Mr. G. W. Atkins read a paper on

Micro-photographic Reductions. [See Lantern Supplement.]

After the paper Mr. Atkins proceeded to demonstrate the process, making three exposures in all. A microscopic slide was coated with wet-collodion and exposed to a wet-plate negative of the *Ten Commandments* for thirty-five seconds. He then developed it, using pyrogallol, fixed in cyanide, and dried, after which it was placed under the microscope for examination by the members, who thought it very good. Mr. Atkins explained that there were generally a lot of wasters to one good slide produced, and every one was by no means a success. Another exposure to a negative of a house was tried, and it being a gelatine negative more exposure was necessary, that given in this case being about seventy seconds. This, on examination, was not so good. The third exposure was for eighty seconds, and was somewhat better. The focussing arrangement was explained. It consisted in reversing the position of the light, that is, to the end where the plate is exposed, and the insertion in the place of the latter of a micro slide, the image of which is focussed on a ground-glass screen, occupying the position of the negative to be reduced. Difference is allowed for between the chemical and visual focus subsequently. The micro lens is carried in a tube, sliding in an outer tube, the joint being rendered light-tight by velvet lining. The actual focussing is done with the micrometer screw, which has forty-eight threads to the inch. In answer to a question, he said the focus of his condenser was about seven inches.

The Hon. Secretary had heard that, in commercial practice, a battery of lenses was used, and the plates were cut up afterwards.

Mr. Atkins subsequently demonstrated the mounting of the slides, the covering glass being affixed with Canada balsam rendered warm, and then pressed into position.

Photographic Club.

April 22,—Mr. Frank Haes in the chair.

Mr. W. D. Welford showed two medals, one in bronze and one in gold, from the Brussels Exhibition, a replica of which was sent to every person whose work was accepted for exhibition. The medals were rectangular in shape, and of chaste design.

Mr. Drage sent a circular with information regarding the coming Convention at Leeds.

Mr. Fry distributed, on behalf of Mr. Alfred Watkins, a number of copies of the different reports and articles which had appeared consequent upon Mr. Watkins's developing competition.

The Chairman drew attention to and explained some examples of archaic lenses.

Messrs. Watson & Son exhibited one of their Alpha hand cameras. This is a very light and compact instrument, which has all the useful movements that a camera should have. It is fitted with a Thornton-Pickard shutter, with a novel attachment for discharging it, viz., an arrangement by which the pressure of the finger which relieves the catch acts against the rest of the hand, and so reduces to a *minimum* the chance of shaking the camera during the operation. The camera has an extension long enough to take one of the combinations of a five-inch lens, and is fitted with a rectilinear lens working at *f*·7·7. The price of the apparatus was stated to be 13*l.* complete.

An interesting discussion took place as to the comparative merits of triggers and pneumatic balls for discharging instantaneous shutters. The general opinion seemed to be that, for a camera held in the hand, a trigger or button was the better method, whilst for a camera upon a stand the preference should be given to the ball.

Mr. Thomas Bedding said he had been using a half-plate hand camera with a ball and tube. He had had almost total failure in securing sharp pictures until he changed his method of exposing.

Messrs. Watson also showed an example of a device which they called the "instantaneous" flange. It consists of a flange in which for the ordinary

screw thread is substituted three jaws on the principle of the universal jaw chuck. A small lever closes the jaws upon the threads of the lens screw, which is thereby instantaneously fixed into position. The device appears to be a very useful application of an old idea to a new use.

Messrs. Shew & Co. showed examples of the Xit camera. The characteristics are extreme lightness and compactness, a whole-plate camera fitted with a Thornton-Pickard focal plane shutter weighing as little as one and a half pounds. The apparatus shown by this firm indicated a high degree of mechanical ingenuity.

Mr. J. E. HODD showed, on behalf of Messrs. Spiers & Pond, a miscellaneous selection of the more recent novelties as follows: Tyler's new vertical fixing bath. This is made in papier-mâché with six separate dippers holding the plates in such a way that they can be taken in and out of the fixing bath without soiling the fingers. It is an excellent device. An adhesive film-holder made by Marion. Although not exactly a novelty, this seems likely to fulfil a useful purpose. Considerable interest was evinced by the members in the use of Marion's sensitive finger covers. Mr. Hodd was good enough to permit the members to retain some that he passed round so that they might try them in actual use, and report at the next meeting. Lancaster's new slide, Mr. Hodd said, was suitable for films or plates. It is made of thin sheet iron and celluloid, and is very light, and cannot be said to be high-priced at 2*s.* 6*d.* Rubber tripod toes and a new portable developing lamp, in which Russian iron is substituted for the "odoriferous" Brunswick-blacked tin, were also shown. Mr. Hodd completed his exhibit by showing the Midget hand camera with a new device for magazine changing. He said that the camera, which was suitable for plates or films, could be loaded in three minutes, and he demonstrated in a deft manner that it could be unloaded even more quickly.

Brixton and Clapham Camera Club.—April 21, Mr. J. W. Coade presiding.—This was an "open" meeting, it being considered desirable to hold such, to enable less experienced members to speak of their photographic difficulties, with a view of eliciting information which would assist them out of the same. The result was entirely successful, the question-box being freely used and the replies and subsequent discussion of much interest.

Croydon Camera Club.—

HOW TO MAKE STEREOSCOPIC PHOTOGRAPHS.

Mr. G. W. WATSON gave an illustrated and succinct description of how to proceed in the making of a photo-stereograph on Wednesday, the 22nd ult., at the Croydon Camera Club, to a full attendance of members, who followed the lecture with considerable interest. Mr. Watson, having sketched the optical points connected with binocular vision, explained how that stereoscopic pictures are practically impossible except by the aid of a camera. For obtaining stereoscopic negatives, *i.e.*, twin views taken from two points about three inches apart, Mr. Watson stated an ordinary half-plate camera could easily be adapted, two ordinary landscape (single) lenses of approximately identical foci being used; or, in some instances, a quarter-plate camera may be employed, moving the camera between the first and the second exposure. An attachment is sold for a few pence by Messrs. Butcher, of Blackheath, which shifts the camera the necessary number of inches to obtain stereoscopic effect when the resulting prints are viewed through the stereoscope. Printing frames, cutting shapes, and various other accessories, which, if not absolutely needful, are exceedingly convenient, were shown and described. A large collection of stereographs, made by the lecturer, were displayed by means of different forms of stereoscopes, and afforded much pleasure as well as instruction. In further illustration of the subject, a number of stereoscopic transparencies were projected on to the screen by means of a biunial lantern, which was kindly provided at short notice by Mr. Alfred Underhill, who handled it with his well known efficiency. The system adopted was the one lately introduced by Messrs. Newton & Co.; the two component stereoscopic slides were respectively coloured green and blue, and were so projected that the red image fell upon the screen a little to the right of the green one. The audience being provided with tinted glasses, so that the right eye looked through red glass and the left through green, the two pictures upon the screen are merged into one, the green and red images becoming as it were mingled, so that the mind receives the impression of a black-and-white stereoscopic view of the ordinary kind. Amongst the members present, many were unable to accomplish this necessary mental synthesis, not so much because of any radical defect in the system, but because, besides a certain proportion of individuals who cannot at all, or can only partially, see pictures with stereoscopic effect, many people, through deficient colour-sensitiveness of the eye, find that the red or the green fails to properly impress the retina.

PETITION TO PARLIAMENT.

A proposition made by the PRESIDENT that the Club should draw up a petition for presentation to the House of Commons in favour of granting amateur photographers the right, under suitable restrictions, to photograph pictures, prints, and other objects of art or interest, in any of the museums and galleries under Imperial control, was unanimously adopted. Such petition will be at once drawn up, and members are requested to lose no time in appending their signatures thereto.

Hackney Photographic Society.—April 21, Mr. E. Farmer presiding.—Reports of the West Drayton and Snaresbrook outings were given by the Excursion Secretary. Work was shown by Messrs. Collins, Wilks, and Hensler. Mr. Hudson showed a new twin-lens hand camera of his own construction. Announcement was made by the Hon. Secretary of the details of arrangements for the forthcoming demonstration and lecture on the X rays, to be held at the Morley Hall, on May 7, by Mr. J. E. Greenhill.

North Middlesex Photographic Society.—April 20, Monthly Instruction Evening, Mr. Smith in the chair.—Mr. COX gave a report on the outing to Hale End on April 18. Mr. CHILD BAYLEY then proceeded to give his demonstration on

BACKING PLATES.

He said that it ought rather to be called the "cure of halation," as there was nothing to learn in the actual coating of the plate with backing. He explained how part of the light, say of a church window or a bright point in falling upon the film of bromide of silver, which is translucent, was partially absorbed, the rest passing through, some passing right through the glass, this upon development appearing as halation. In connexion with this, the halo sometimes seen round a window was due to the illumination of the dust particles in the air, although this was sometimes exaggerated on development, but could not be called true halation. To get over this, a substance having the same refractive index as the glass, and having a non-actinic colour, is applied to the back of the plate, which prevents this reflection, and practically renders the reflecting surface non-existent. Caramel has this property, and is the basis of most backing mixtures. Collodion stained with aurine is also effective. Another method of minimising halation consists in staining the film itself, and for this reason isochromatic plates give less halation than ordinary, owing to the dye they contain. Another method, the subject of a patent, consists of interposing a film coloured with permanganate of potash between the glass and the bromide of silver. He passed round several plates coated with various backings, also a piece of plain glass coated, and it was seen that the reflection of the gas flame almost totally disappeared where the backing had been applied. In reply to a question from Mr. Smith, Mr. Child Bayley said that a quick development with a strong developer tended to show less halation than a long development or a weak one. Mr. Wall asked if backing decreased the rapidity of the plate. Mr. Bayley said that this was the case theoretically, and it was borne out in practice. He then proceeded to make some caramel, having deferred it till the end of the evening owing to the unpleasant fumes given off. It consisted in heating powdered sugar with constant stirring in a saucepan over a gas jet, to a temperature of about 405° Fahr. for about ten minutes, the sugar gradually melting, darkening in colour, and boiling up. When it no longer tasted of sugar, it was about done. If the temperature rose much above that mentioned, or it was too long heating, it was carbonised and spoiled. He boiled some caramel in water and added some red ochre, a little spirit to make it dry quicker, and some gum water to make it dry harder and prevent powdering. He then coated a plate with some that he had thus prepared, and passed it round for inspection.

APRIL 27, Mr. S. E. Wall in the chair.—Mr. H. W. BENNETT delivered a lecture upon

COPYING.

He explained the methods of obtaining equality of lighting, and showed diagrams of various mechanical sliding rests for the camera. He dwelt upon the necessity of the object copied being parallel with the screen, and the method of securing this, the advisability of removing the lens and screen and examining for reflections, especially when copying oil paintings. He also pointed out the methods of correcting the defects arising from the use of single lenses, and the misuse of the swing back, and touched upon many other matters connected with his subject. An interesting discussion followed, in which Messrs. Pither, Mattocks, McIntosh, Cox, and others joined.

South London Photographic Society.—April 20, Mr. F. W. Edwards F.R.P.S., in the chair.—Prints from negatives taken at the Easter excursion to Chichester were shown. Mr. NAHUM LUBOSHEZ, of the Eastman Photographic Materials Company, gave a lengthy address on the working of

PLATINO-BROMIDE PAPER.

He first pointed out the difference between this and the ordinary bromide paper. It was essential that a developer should be used which did not stain, and left the whites of the image pure; also that it should be capable of reducing all the sensitive salts upon which the light had acted. He strongly recommended ferrous oxalate for the purpose, and the image, coming up gradually, permitted alterations in the component parts of the developer to be made to correct slight errors in exposure. One part of iron solution to four parts of the oxalate solution gave the blackest tones, but one to ten could be used to produce soft results. It had the advantage of not developing a correctly timed exposure beyond the right stage. Amidol, metol, hydroquinone, &c., could be used, but with each of them it was essential that one should be able to judge when to stop development. After fixing, the image can be toned to a beautiful brown by immersion in a solution of alum, 1 part; hypo, 10 parts; and water, 80 parts, which should be gradually raised to the boiling point.

Birmingham Photographic Society.—April 21, Mr. J. H. Pickard in the chair.—Mr. G. A. THOMAS lectured on

DEVELOPMENT OF PLATES FOR BEGINNERS.

Touching slightly upon the theory of development, which the lecturer considered should not be altogether overlooked by the beginner, strong objection was made to the use of ready-made developers, the composition of which was only known to the makers. It was recommended to warm all solutions and dishes in cold weather, or the effect of an under-exposed picture would be the result. As it was very difficult to judge of the correct exposure in all cases, it was advisable to give what might be considered too much exposure, and resort to careful and intelligent development.

Citric acid was often very useful where very great excess of exposure had been given, as its action was to immediately stop development of the shadows, and the high lights might be built up with a strongly restrained developer.

When using porcelain dishes the developer frequently frothed up, owing to the uneven surface upon which the plate rests. This can be prevented to a very great extent by the addition to the developer of sulphite of soda. Many hints were given on prevention of halation by the use of asphalt, or burnt sienna and gum.

An interesting discussion afterwards followed.

Mr. PICKARD (the Chairman) said that negatives were best intensified by bleaching with bichloride of mercury in the usual way, and after thoroughly washing should be allowed to remain in a solution of bromide of ammonium, and then redeveloped with ferrous oxalate.

Derby Photographic Society.—April 21, Mr. A. B. Hamilton in the chair.—The pictures entered for the Outdoor Meeting Competition, 1895, were exhibited, and the report of the Judge, Mr. W. England, read. The Chairman presented the awards to the successful competitors, Mr. G. Walker taking the

silver medal for a well-known view in Chee Dale, and Mr. E. Fearn the bronze medal for a carefully selected study at Weston-on-Trent. The Chairman made a presentation, on behalf of the members, consisting of a gold albert and pendant, to the late Secretary, Mr. T. A. Scotton, as a mark of esteem and appreciation for his services during the past four years. The competitions for 1896 were then announced, and the meeting concluded with a paper, entitled

NOTES ON LANDSCAPE,

by Mr. F. L. Pither, ably read by Mr. T. Walker. The outdoor meetings of the Society will take place on May 30, June 20, July 25, August 22, and September 12.

Liverpool Amateur Photographic Society.—There are few places in the immediate neighbourhood of Liverpool where a more enjoyable Saturday half holiday can be spent than the district between Bromborough village and Raby Mere, and the artist, either with brush or camera, finds abundance of work in the picturesque lanes and the old ponds with reedy margins and dark water that reflects most perfectly the twisted oaks which overhang the banks; and Saturday's excursion of the Photographic Association was most successful, for nearly one hundred and twenty negatives were obtained by the members of the party, who numbered about twenty. The walk through Dibbinsdale was greatly enjoyed, as also was the excellent tea provided for the party at Mill House, Raby Mere.

Kilmarnock and Ayrshire Photographic Society.—April 18, Mr. J. Mack Wilson presided.—A limelight exhibition of slides was held. A magnificent series of views of interiors of English cathedrals and of the Royal Mausoleums was shown. The views had been taken on Thomas's antihalation plates, and certainly showed the advantage of using these plates for interiors. Mr. J. R. Hunter, architect, Ayr, showed slides, illustrating the beauties of architecture in the ecclesiastical buildings of Somersetshire. The President, Vice-President, and several other members showed slides.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE COLOUR OF NEGATIVES AND RETOUCHING.

To the EDITORS.

GENTLEMEN,—The article on colour of negatives and retouching them in last week's JOURNAL opens up a subject not without interest, especially the colour of negatives and their effect upon the eyes. Classing negatives, so far as colour is concerned, under two headings, blue grey and yellow stain, the slightly stained negative is more soothing and pleasant, and does not tax the eye of the retoucher as does the cold blue-grey class of negative, or, rather, that is my experience.—I am, yours, &c.,

J. A. MOORHOUSE.

18, *High-street, Sutton, Surrey, April*, 21 1896.

TRAILL TAYLOR MEMORIAL.

To the EDITORS.

GENTLEMEN,—Subscriptions to the Memorial Fund are still coming in, but, naturally, more slowly than when the list was first opened. We are looking forward to a very hearty response by the Photographic Societies to the appeals made to them in your columns by Messrs. R. P. Drage, P. Everitt, and others, and, since, in a letter addressed to each Honorary Secretary by myself. I have a few societies' subscriptions already in hand, and have information that the matter is under consideration by the councils of several others, and that in many cases subscription lists have been opened.

A generous offer has been made by the Autotype Company to subscribe ten guineas to the fund, conditionally upon the amount subscribed reaching £500, which ought to be of assistance in drawing subscriptions.—I am, yours, &c.,

ALEXANDER MACKIE.

FIFTH SUBSCRIPTION LIST.

	£	s.	d.
The Hackney Photographic Society	5	5	0
,, Birmingham Photographic Society	2	2	0
,, Photographic Society of Madras	2	2	0
,, Richmond Camera Club	1	1	0
,, Brixton and Clapham Camera Club	1	0	0
Mr. A. L. Henderson	5	5	0
,, A. Seaman (Chesterfield)	2	2	0
,, H. P. Robinson	1	1	0
,, J. Lang (Shrewsbury)	1	1	0
Col. Waterhouse	1	1	0
Messrs. Sellman & Co. (Huddersfield)	1	1	0
,, F. W. Verel & Co.	1	1	0
,, Geo. Nelson, Dale, & Co.	1	1	0
Mr. S. H. Fry		10	6
,, Washington Teasdale		10	6
,, D. Whyte (Inverness)		10	6
,, L. Warnerke		10	0
	£27	4	6

"PHOTOGRAPHIC ILLUSTRATIONS."

To the EDITORS.

GENTLEMEN,—The comments in your "Ex Cathedrâ" of the 24th and 17th ult., will certainly do good, in deterring the producers of bad works in this line (for it must honestly be admitted that some shocking abortions in half-tone have appeared in the illustrated press, but it will as surely spur on those who have the artistic ability for better work to meet the requirements of the illustrated press and book publishers). I have (admittedly) produced some fairly good work, which yourselves (and the late Mr. T. Taylor, and others) have noticed as being "fine artistic work" productions, as composite combinations of photographic and fine-art manipulations for illustrating purposes. The writer of the article in the *Publishers' Circular*, noticed in your "Ex Cathedrâ," is mostly right in his remarks for special knowledge, for this special line of work is really very necessary; but, with such knowledge, it is assuredly possible that high-class work can, and will continue to, be produced, let the lay press say what it may against it; for I know, from many years' practical experience as a scenic artist, stage manager, draughtsman, and photographer, that a thorough, all-round study is necessary before the results suitable for the highest class of illustrations can be produced. But to men of all-round qualifications splendid results can be produced by the half-tone photo-process, given that the originals are specially produced with this motive in view and that the blocks are as carefully produced therefrom.

Art editors and publishers nowadays are too wide-awake to their own interests to throw aside a process of production that has already given them so wide a scope for the saving of time and money, in spite of all the twaddle that has or can be said. It cannot honestly be denied that some very beautiful results have been produced as pictorials by photo-art work. The writer you have quoted honestly admits that "the figures were arranged with considerable effect." Here is the keynote for the art editors and publishers for what to avoid. They will, in future, refuse "combination" productions, wherein such "penny-gaffy backgrounds and scenic paraphernalia appear." But they will assuredly heartily welcome and accept good combination work, showing artistic, component harmony in the entire production, and with such I shall, at all times, be pleased to correspond upon this subject.—I am, yours, &c.,

PHOTIQUE-ART.

"AN AMUSING REPLY."

To the EDITORS.

GENTLEMEN,—Mr. "Richardson Brown" is, I think, in error. The only "hand-book" of mine yet published is on *Lantern Slides* (P. Lund & Co.), and a careful perusal thereof, of both first and second editions, brings to light no such sentence as your correspondent quotes. To my recollection I never used sulphate of soda (Glauber's salts) in a developer in my life, and I am quite sure I never suggested its use to any one else.

Pressure of other business prevents me looking more deeply into my various proofs and MS., but I am sure the above statement is correct.—I am, yours, &c.,

J. PIKE.

7, *Church-drive, Carrington, Nottingham.*

THE RIGHT TO PHOTOGRAPH.

To the EDITORS.

GENTLEMEN,—May I draw attention to the fact that the Croydon Camera Club is preparing a petition for presentation to the House of Commons, asking that amateurs may be permitted to photograph objects in the national collections? I would suggest that other photographic societies should adopt a similar course.—I am, yours, &c.,

HECTOR MACLEAN.

ASSISTANTS AND THEIR GRIEVANCES.

To the EDITORS.

GENTLEMEN,—I heartily endorse Mr. Randall's remarks in your last issue that all assistants owe a heavy debt of gratitude to the late Mr. Traill Taylor and you, sir, for the kind sympathy with every well-directed effort to improve the condition of photographic workers—to enable them to work in sanitary workshops, to obtain fair wages and reasonable hours of employment, and for opening your columns on behalf of those assistants who have legitimate grievances.

I quite agree with "North Wales Operator" and Mr. Randall that the time has arrived when something should be done to make the sweated assistant's life a little brighter. As one who has served for a few months and seen the inner working of this large firm of cheap photographers, and who has been in touch with nearly every assistant employed by this firm, will you allow me space to say that the real grievances are bad pay, and a great deal less of that which the two heads of this firm are past masters in, *i.e.*, bullying, also the want of holidays, which is very keenly felt by all hands. Now, gentlemen, all work and no play makes Jack a very dull boy. Although the heads of this firm take an annual holiday, it never occurs to them that their assistants should also have a due share of recreation and relaxation after a round of monotony terrible to think of.

True their studios close early one day, but this is only a farce. The operators, as already pointed out in your columns, stay long after that hour shut up in a close ill-ventilated dark room developing; the nerve of the assistant is really nothing. Surely operators, &c., who have to take from forty to fifty sitters a day, must need a brief holiday, which would be a source of strength to mind and body, qualifying each to resume his monotonous round of daily life with renewed spirits and restored health; yet this is denied them; it cannot be for want of money.

To stop this grinding, a union should be formed to shorten the hours of labour and regulate the relations between employers and employees, also to assist members in case of distress, through illness or want of employment. I am sure, to secure the above, all photographic workers would not object to a small contribution, say, from threepence to fourpence per week.

Should only a small number join, rather than let the matter drop, could not they amalgamate with some other union of an allied trade, and wait for development? If a meeting could be arranged after business hours, I am sure there would be a good attendance of assistants, for I want to set it down, as unmistakably as I can, that all photographic workers stand sorely in need of some means of appeal against unjust dismissal, sweating, and the petty tyranny which is carried on by some firms; and, to do this, workers should stand shoulder to shoulder to form a union to fight for their grievances. Should it be impossible to do this, perhaps some of your readers would be able to devise means which, to some extent, would relieve these grievances.

It is lamentably true that these assistants are afraid to lift a finger in their own behalf. They are content to put up with any form of treatment, for they know there are more recruits on the firm to snap up their places if they should "kick." With two or three exceptions, the operators are mere lads, bred and born in the firm, who, after serving a few months, pick up a slight knowledge of operating and retouching, and are drafted into the first vacancy which occurs with the magnificent salary of 20*s.* to 25*s.* per week. It is with this class of assistants, who have no previous experience, the firm like to deal. At several studios where I was sent to retouch, the assistants dread the time to come when one or the other of the heads of the firm arrive to check the negatives, make up the books, and commence bullying should the takings for the day not please them.

In conclusion, will Mr. Randall kindly state in what way sufferers are to come forward and state "who are the wrong doers?"

Apologising for the length of this letter,—I am, yours, &c.,

A Retoucher of Thirty Years' Standing.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

Stocks' Lamp.—H. Becker says: "Please will you be so kind as to tell me the address of the maker of Stocks' patent lamp for projection (four wicks)?"—The address is W. Stocks, Rye, Sussex.

"The Black List."—J. A. Randall. This ceased to exist some four or five years ago. Our experience was that it exercised a great moral effect—at any rate, we have not found cause to continue or revive it.

Copyright.—Doubtful. If the engraving you desire to copy and publish was published in 1697, you can copy it without let or hindrance. If it were a recent reproduction of the work, the case might be different.

The "Photo Gazette."—Alex. Grant. We cannot remember the particular number referred to. Call at the rooms of the Royal Photographic Society, 12, Hanover-square; the Secretary will probably allow you to consult a file.

Starch.—T. Rogers. It is white starch that should be employed for mounting photographs, not the blue. There is a kind known as "moulding starch," which is admirably suited to the purpose, but we think it can only be had from the manufacturers direct.

Clearing Bromide Enlargements.—E. Mentor asks: "Do you consider that clearing bromide enlargements with hydrochloric acid has any injurious effects upon the enlargement?"—Yes, decidedly, unless the acid is thoroughly washed out of the paper before they are put into the hyposulphite of soda fixing bath.

Cracked Prints.—R. E. C. The cracks are caused by the prints being allowed to curl up as they dried; then, when they were flattened out, the albumen cracked as seen. This is no uncommon thing with thickly albumenised paper. The remedy is to dry the prints between blotting boards, so that they are kept flat the while.

Stamp Portraits.—S. Burrows. In taking postage-stamp portraits it is usual to take them with a number of miniature lenses—four or five, or up to a dozen or more. If only one lens be used, then, of course, the plate must be shifted after each exposure to get the number of portraits on the plate. The same end will naturally be obtained by moving the lens instead of the plate, but then there must be a number of partitions in the camera corresponding to the number of portraits taken, the same as if the work were done with a number of lenses.

Pathology.—Sawbones asks: If there is any real advantage is using orthochromatised plates in photographing surgical and medical subjects. He has, he says, used both kinds of plates—orthochromatic and ordinary—and finds no difference whatever between them. He says further that he has not employed a colour screen, as he is told that that is not necessary. We should recommend that the experiments be repeated with colour screens of different tints, according to the subjects, then a decided advantage in favour of the orthochromatised plates should accrue.

Washing Prints.—W. Hawkins writes: "What is the proper time to give prints in washing, after fixing? Some say, Wash all night; others say that gelatine prints will not bear more than an hour's washing without their going yellow; which is right?"—The prints should be washed until all the hypo salts are eliminated, and the quicker that can be done the better for the stability of the prints. If prints on certain papers will not stand more than an hour's washing without deterioration, they must be carefully attended to the while. Prints, however, can be as effectually washed in an hour or two, with careful attention, as with many hours soaking.

Use of Dark Rooms.—R. C. complains that, "on applying to three professional photographers in a country town, they refused him the use of a dark room to change and develop a few trial plates in unless he paid, what he considers, an exorbitant fee for the privilege, although none of them had sitters at the time. He says this is hard upon amateurs, and churlish on the part of professionals."—Every one has the right to fix his own terms; and, if, what we have often heard of the behaviour of some amateurs when they have obtained the use of a room be correct, we are not at all surprised if, in some instances, they are high. Some we know will not allow the use of their rooms on any terms whatever.

Toning Difficulty.—J. T. P. "The present is to trouble you respecting a difficulty I am in as to getting a good toning bath for albumen paper to produce good black or purplish-brown tones. Of the three specimen prints I enclose, No. 1 was toned with the usual acetate bath, and Nos. 2 and 3 with the carbonate bath. The prints were well washed, then put in a bath of washing soda and water (half ounce to the pint) to neutralise the acid, again well washed, and then toned. Chalk had previously been added to the gold, as usual, yet the toning was very slow indeed, and, as you see, the tone anything but desirable, and when they reached a certain point they would not alter at all in tone. Prints from other negatives were done at the same time, but they all turned out, unfortunately, with the same rusty tones. The only thing I omitted to use was distilled water. Would this account for it? The bath was heated to about 70°. If you can possibly assist me as to the cause of failure, I shall be greatly obliged, as I have always failed to obtain good tones with albumen paper?"—As our correspondent does not tell us anything about the preparation of the albumen paper, the salting of the albumen, sensitising, &c., we can give very little information of value on the subject. We may say, however, that quite as much, or more, of the tones, depends upon the negatives as the paper or the toning baths. With suitable negatives the acetate or the carbonate toning baths will yield the tones desired. If ready-sensitised paper be used, we should suggest that another brand be tried with the same negatives.

Doubtful Conduct.—Painting writes as follows: "Can you kindly give me an idea how to act under the following circumstances:—A man I have been acquainted with for some time, who is a portrait painter, agrees verbally to paint portraits for me, at a fixed charge, from my negatives. He has done several for me, and I have paid him for them. I got an order for a painting from one of my negatives of a child that had been dead some months. He did the painting, and I paid him for it when he brought it home. As it was a good subject, he casually mentioned that he thought he would paint a larger size also; this was to be a specimen of work. I have never seen this one. He brought home the small one that I had ordered, and, as he happened to be going in the locality where the customer lived, which is about sixty miles from here, I entrusted him with the small picture that was ordered to be taken home, thinking that if any alterations were needed he could make them. It was also arranged between us that he should take the large picture as well, and I told him, in the event of the customer wishing to purchase it, what price to ask. He had never seen the customer before. It appears that the customer did purchase it, as I sometime afterwards discovered, and also paid him the full amount I had told him to ask for it. I should much like to know if you think he has a right to act in this manner. As he refuses to have anything to say in the matter, and has appropriated the whole of the sum the lady gave him for the picture, can I claim through the County Court or otherwise my profit on the same, as it does not seem right that I should have to conduct my business and take negatives for his use? Trusting you will favour me with a reply?"—The man has behaved in a very unhandsome, not to say "dirty" manner. You also did an unwise thing in entrusting such a man with your customer's address. We do not see that you have any remedy at law in the matter. The only remedy that we can suggest, which has already, no doubt, been adopted by you, is not to entrust the man with any further work. You might further mention the matter to your photographic friends. Such a man as that is not to be trusted with work for the profession.

THE BRITISH

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EX CATHEDRÂ.

The Process Year-Book for 1896, which has just been issued by Messrs. Penrose & Co., of Amwell-street, is a notable book. It contains nearly a hundred illustrations in line, half-tone, collotype, photogravure, and colour, and many articles by qualified writers and experimentalists to whom the process man may safely turn for help and guidance in his doubts and difficulties. It is a production of which editor, publishers, and printers may be proud—indeed, to the printers, Messrs. Allen & Carruthers, of the Cranford Press, Chiswick, distinct and special praise is due for the unusually excellent manner in which both type and blocks have been rendered.

* * *

To those interested in process work Messrs. Penrose's volume will be welcome, as conveying a good idea of the strides that have recently been made in half-tone and three-colour work. Our pleasure, however, in turning over its handsome pages is alloyed by the reflection that the apathy of photographers has forced what is virtually a new industry to appropriate work which, from its very nature, photographers should not have allowed to pass them. But process work, in all probability, is yet in its early stages, so that, to the photographer who decides to take up some branch of it, the opportunity may still be available. As contributors to the volume we are mentioning, we note the names of Max Levy, Vidal, Dallas, Henry Blackburn, Wilmer, Wall, Denison, W. D. Richmond, E. S. Shepherd, &c. The illustrations are by the best known firms.

* * *

The Hackney Photographic Society has been endeavouring to induce the great railway companies to grant to amateur photographers some concessions in the matter of reduced fares on photographic outings. The companies decline, however, to entertain the idea. Not being followers of the gentle craft, we are not in a position to precisely understand why anglers were originally granted privilege travelling tickets, and therefore we hesitate to plead that photographers should be placed on the same footing as the fishermen.

* * *

Cheaper fares would probably lead to increased attendances at photographic outings, so that the companies would conceivably not suffer by the concessions. On the other hand, we must assume that there are good and cogent reasons for the refusal of the companies to give way. In an interview with some railway representatives on this very subject some few years ago, it was stated, if we may trust to memory, that the companies were actuated in their refusal by the idea that the privilege tickets, though ostensibly to be used for strictly photographic purposes, might very easily be availed of for ordinary travelling, pleasure, or business objects, a factor which possibly need not be reckoned with in the case of anglers, who are restricted as to localities and seasons, thus making abuse of the concession difficult.

* * *

Our contemporary, *Nature*, moved by some sharp comments in the daily press with reference to the fact that, in a recent patent dispute, eminent scientific experts figured as opposing witnesses, with the result that, though the question to be determined was simply one of chemistry and chemical history—matters of pure science, in fact—there was a remarkable conflict of testimony, has again suggested the abolition of the expert witness, and the institution of a system whereby a scientific expert should not be called by a particular side in a case, but should be nominated by the Judge. Under such a

system, it truly remarks, no question of bias could be raised, and science would not be scandalised from time to time, as it is now, by those who are content thus to trade on their scientific reputation.

* * *

Universal endorsement will assuredly be given to our contemporary's suggestion. The inducements to an official expert to depart from accuracy would be removed, so that the truth would be more readily arrived at than under the present system where it appears that, the more eminent the witness, the greater is the influence upon his testimony exercised by the amount of his fees. There have been cases in photography that have called for the intervention of "scientific experts," whose opinions have been not less contradictory than in the instances quoted above, which persuade us that it would be a good thing if the unofficial expert witness in photographic disputes were also abolished. We have in mind a case in which, a year or so ago, certain markings on a photograph were said by some expert photographic witnesses to have been produced in a particular way. Some equally expert photographic witnesses were in attendance, to prove that the markings were due to totally different causes. It was a merciful thing for expert photographic testimony that the case, half way through, was stopped by the jury.

PHOTOGRAPHY AT THE NATIONAL GALLERY.

The refusal of the Trustees of the National Gallery to allow amateur photographers to copy the pictures seems to be causing some little annoyance in certain quarters. Since the publication of a correspondence between the Secretary to the Trustees and one of the members of the Camera Club, a question on the subject has been put in the House of Commons. The reply given, however, does not appear to please the Croydon Camera Club, which, according to a letter in our last issue, is going to petition the House on its own account, with what results remains to be seen.

The recent correspondence brings to one's mind what was done a dozen or so years back. It will be remembered that up to about that time there were no really good reproductions of our national pictures, as a series, such as there were of Continental galleries. Then a German firm obtained permission to photograph the collection, and also the liberty to erect a studio, outside the building, in which to do the work. There was a great outcry at this at the time, and the explanation given was that the firm that had obtained the concession had given certain undertakings as to the publication of the copies, also that the reproductions it had made in the various Continental galleries, where similar facilities had been given, were of an exceptionally high order as compared with other work at that period—for then orthochromatic photography was in a very embryo state, except with that firm and one or two others. A further reason for the concession was that the copies would be widely circulated, which would be a great boon to art students.

The fact that some of the pictures had been previously photographed by a French house, no doubt, gave rise to the idea, which still seems to prevail with some, as evidenced by Mr. Craigie's letter to the Trustees, that only foreign firms were allowed to photograph our national pictures. As a matter of fact, some English houses are continually at work upon them —the Autotype Company, Messrs. Eyre & Spottiswoode, and others. The former, by the way, have for some years been privileged to hang frames of specimens of their reproductions in the entrance hall of the building. Again, Messrs. Walker & Boutall are at present engaged in photographing the works in the National Portrait Gallery for publication. This at once dispels the idea that only foreign houses are permitted to photograph in the National Gallery.

We now come to the question, just being raised, of amateurs being allowed to photograph the pictures. The pictures are the property of the nation, and the Trustees are their custodians, and are responsible for their safe keeping. They are at the same time interested in the furtherance of art and its study, and it is to this end that professional photographers are allowed to reproduce the pictures—because they will be published, and so become of service to art students and lovers of art generally. The Trustees also have in mind that the work should be well done or not at all, and we doubt much if any professional would be permitted to take photographs of the pictures unless the former were tolerably sure that the work would be well executed, and that there was a prospect of its being widely circulated. No such end is gained by the amateur photographer; he simply photographs a picture for his own amusement, and there is an end of the matter, as, beyond his immediate circle, no one sees the result, whatever may, or may not, be its merits. During the time the amateur would be at work he would, of course, be monopolising the picture from the public; and, as it was said in one of the letters that opened this question that the reproduction of pictures involves an immense amount of time, such as the professional is rarely able or willing to give, it may be fairly assumed that the amateur will monopolise the picture for a much longer time than does the professional. If that be the case, it is a strong argument in favour of the Trustees' refusal.

Amateurs ask for the same privileges as art students are accorded; but, as was explained in the reply given in the House of Commons, the cases are widely different. The latter copy the works to improve themselves in drawing and painting, but the amateur photographer could no more improve his photographic knowledge by copying a Raphael, a Teniers, or any other great master, than he would by reproducing any other oil painting. If it be urged that his object is to improve his art knowledge, then that end would be better gained by purchasing, for an almost nominal sum, one or other of the published copies, which are infinitely superior, as regards the translation of colours, to the majority of amateur productions.

One of the reasons assigned for the refusal to amateur photographers was that the galleries are now often inconveniently crowded with students, and the presence of cameras would further increase the inconvenience. We strongly suspect, however, that there is another reason that may, and no doubt does, weigh with the Trustees, namely, the risk of irreparable injury to works for which the nation has paid fabulous amounts. Removing the pictures from the walls, unglazing them, and exposing them to the air for a time; then, after they are copied, reglazing and rehanging them, even by the most careful hands, involves a certain amount of risk. Hence, the Trustees of the nation's pictures, naturally, do not care to incur this risk, however remote, oftener than can be avoided, particularly in face of the probability that it would frequently have to be repeated, with the same picture, with the amateur who is "able or willing to afford" the time and attention to the work. With the art student no such danger is incurred.

Taking all these facts into consideration, it is scarcely sur-

prising that the Trustees refuse to risk the safety of the nation's pictures for the amusement of single individuals. However, we shall see what comes of the Croydon Club's petition to the Commons—if it is ever presented.

IMPROVISING A SCREEN-HOLDER.

MANY amateurs and others commencing experimental work in half-tone etching are met by the difficulty of finding a suitable dark slide or holder in which to use the screen. The ordinary dark slides do not afford sufficient space, while the special holders constructed for this purpose are necessarily costly appliances, owing to the elaborate and delicate arrangements necessary for the accurate adjustment of the relative positions of screen and plate.

Although for real working purposes such a special holder may be said to be an absolute necessity, the early experimental attempts may be very well carried out by means of makeshifts, which entail no great expense should it be ultimately decided to relinquish the work, and yet enable the operator, with a very slight amount of extra trouble, to achieve as great accuracy as with the more expensive tools. The following description of an improvised holder may prove useful to some of our readers at the present time.

Unless specially ordered of the exact size, the half-tone screens supplied commercially are, as a rule, considerably larger than the size of plate they are supposed to represent; for instance, a half-plate screen will be nearer the size of a whole plate. This being so, either a larger size of camera should be available or the screen must be obtained of the exact size of some existing one, in which case it will be advisable, if not indeed absolutely necessary, to work with a smaller size of plate.

It is possible in some of the old-fashioned cameras that the slides, at least the double ones, will allow sufficient room for both screen and plate, together with the requisite separation between them; but this will not often be the case, so we will assume that the existing slides are not roomy enough. In order to supply the deficiency, remove, in the case of a single slide, the hinged back door, and, in the case of a double, one of the shutters and the central division, and, in the place of either, have fitted a frame carrying a central aperture a little larger each way than the largest plate to be employed. Have constructed also a carrier, by means of which the screen can be adapted to the dark slide; and in the majority of cases this will be found to occupy nearly, if not quite, the whole of the available space within the slide, so that, when the back frame is fitted in position, it keeps the screen-carrier in place, and the central opening forms a well or rebate, into which the sensitive plate can be dropped, in actual contact with the screen if desired.

But, as a certain amount of separation is always needful, this can be secured by the interposition of one or more cardboard masks, and, if these are cut from boards of uniform thickness, they will serve to definite and variable distances between screen and plate at will. This is all that will be needful if dry plates are used; but, with wet plates, some light form of mask or carrier must be provided to hold the plate, the additional masks being still used to secure variations of distance. A hinged or, preferably, a detachable back door with spring fitted to the opening will complete a holder, which, with the aid of a loose piece of ground glass, will serve at once as focussing glass as well as screen-holder or dark slide.

Photography inside a Crookes' Tube.—The mode or place of genesis of the Röntgen rays is still matter of doubt, and, in the endeavour to solve it, M. G. de Metz has taken photographs actually within the tube itself. He finds the cathode rays possess one of the properties of the Röntgen rays, in that they penetrate aluminium, cardboard, and paper, but are stopped by platinum and copper.

Mr. Espin on Fluorescent Screens.—Writing to the *English Mechanic*, he describes his success with the tungstate salt, which appears to have been very considerable. He says the tungstate of calcium screen was examined in the dark, and found, even half an hour afterwards, to be luminous; but a fresh sample taken into the dark from a gas-lit room was found to be quite free from luminosity. Esculin and quinine, which give fluorescence with the ordinary vacuum tube, are useless, he states, for the Röntgen rays.

A Novelty in Litmus.—Though no photographic equipment is complete without a book of litmus paper, more often than not termed in the printing room "test paper," as though it were the only test paper in existence, yet we are afraid that a fair sprinkling of establishments in a large way of business manage to do without it. However, those who are familiar with its advantages will be pleased to learn of a new form for using litmus which bids fair to do away with the time-honoured little book of slips. It consists of a litmus pencil, in which the tinctorial material replaces the usual graphite. The pencil, further, is red at one end and blue at the other, the use of which is obvious, as, indeed, is the value of the whole pencil. A piece of clean white paper and a stroke drawn by each end of the pencil will afford the handiest of tests imaginable. The agents are Messrs. Christy & Co., of Lime-street, E.C.

A Novelty in Magnesium Light.—Magnesium for flash or "torch" has been very popular for some time past, but ribbon or wire is very liable to "give out" just when the light is most needed, except when special precautions are taken or arrangements made. But the new method of burning seems to offer a perfect medium of actinic combustion. It consists in the "sandwiching" of magnesium powder between sheets of paper impregnated with potassium chlorate. Magnesium powder is placed between two sheets of paper, which have been pasted over with starch. The whole, when dry, forms one single sheet. Next, each side is covered with a piece of paper impregnated with potassium chlorate, and the whole covered with a further sheet of paper pasted on each side, a thick sheet, almost like cardboard, being thus produced. It may then, when perfectly dry, be cut into lengths and ignited as required. According to the *Journal of Chemical Industry*, the combination is quite safe and keeps well.

Where do the Röntgen Rays Emanate from?—M. Poincarré, criticising M. de Metz's conclusions, propounds the theory (these papers all being presented to the Paris Academy of Sciences) that the conclusions given are not correct, seeing that, he says, the cathode rays striking the aluminium or platinum screen may then go through the metallic plates. The cathode rays themselves may not possess this property. Many experimenters have been on this track. Perrin used a process of pinhole photography, and arrived at the conclusion that they arise at places where the cathode rays strike against a solid obstacle. Rowland, Carmichael, and Briggs gave the anode as their origin. Prince Galitzin and M. de Karnogitsky locate their origin within the tube a few millimetres behind the glass. In an article in *Nature* over the signature of J. J. Thompson, the writer states that the result of a series of experiments, in which he was aided by Mr. McClelland, led him to believe that they always emanated from a place where the cathode rays struck.

Phosphorescent Screens for the Röntgen Rays.—The best material for this purpose has been much discussed lately, and there may be said to be almost two schools of opinion. On the

one hand, a platino-cyanide, be it of potassium, lithium, barium, &c., is found to be unequalled; while, on the other, the calcic tungstate is said to be superior to anything. Among the upholders of the latter is Mr. Edison, who has now completed his adaptation of the original idea in the shape of an instrument to show the internal structure of the body by the Röntgen rays and phosphorescence. The method he adopted for producing the crystalline form of this salt is, according to the *Scientific American*, to fuse together a mixture of sodium chloride, calcium tungstate, and calcium chloride. Calcium tungstate, insoluble, is produced, and is obtained by washing with water, which dissolves out the soluble salts, and leaves the required body behind. Then, again, another experimenter, as already alluded to by us, prefers the natural crystals as found in a cheap mineral. Mr. Swinton writes to *Nature*, under date of April 22, comparing the platino-cyanides: "I have obtained considerably better results with a finely ground sample of calcium tungstate, prepared for me by Messrs. Hopkins & Williams. It may be used either in loose powder or made up with gum into a paste and dried." Yet other writers say that the ordinary salt is no use at all. It unfortunately happens that, so far, the crystalline salt is not an article of commerce.

PRACTICAL PHOTOGRAPHY WITH RONTGEN RAYS.*

The Coil or Transformer.

Having now fitted up an arrangement for producing a current of electricity, we proceed to transform it in character. The electric current obtained as explained would only pass through a very small fraction of an inch of air, and we wish it to have power enough to pass, in the shape of a spark, through several inches. The technical way of saying this is, increase the electro-motive force (usually put thus—E.M.F.). The greater the E.M.F. the longer the spark obtainable from the same amount of electricity. The intensity of this E.M.F. is estimated in volts; each cell of a Grove pattern has an E.M.F. of a little under two volts. When the character of the current is changed, its E.M.F. would be reckoned in thousands, or tens of thousands, instead of units. The most generally used and most readily obtainable form of transformer is that known as a Ruhmkorff's intensity coil. It is not necessary here to explain its working parts; it is sufficient to say that the electricity goes in at a few volts' strength, and passes out at many thousands volts. There is a pair of binding screws on the baseboard of the coil, to receive the two wires from the battery; and there are two smaller binding screws, usually at the upper part of the instrument, for attaching the wires that take the transformed current out of the instrument. Any one purchasing a coil would have its working described by the seller, so that it would be filling unnecessary space to give those details here, slight though they are. But a particular caution must be given, never to touch one of these screws (the terminals) or even a silk-covered wire, passing from them, with the hand; a very severe shock would be felt, even with a small coil, while, if both terminals were touched at once, the effect would be very serious, and might possibly be fatal, especially with a large instrument.

It may here be noted that it is better to use insulated wires for the current from the battery (the primary current), and essential to do so with the current from the coil (the secondary or induced current). It is very difficult to avoid at all times touching the wires accidentally and receiving a shock; and, besides, the current would be weakened if bare wires were used, and could not conveniently be led away with uncovered wires, as it would strike to external objects and be diverted.

These Ruhmkorff's coils are obtainable of a variety of powers, from those giving a spark of a quarter of an inch to others of three or four up to twenty inches or more. The longer the spark, the higher the price. The battery power has to be proportioned to the strength. Messrs. Griffin, of Garrick-street, who have made me a new coil which sparks beyond the guaranteed distance recently, have been so good as to make a special series of actual trials for me, in order to ascertain practically the safest and most suitable battery power for various sizes of coils. Though it applies to their own instruments, it would, no doubt, be about the same for other makers:—

Coil to give in Air a Spark of	Groves' Cells Needed,	
1 inch	Three	1 pint.
2 inches	Four	1 „
3 „	Five	1 „
4 „	Six	1 „
6 „	Five	1 quart.
8 „	„	1 „
10 „	„	1 „

The Crookes' Tubes.

We are now ready to turn the electricity in these famous bulbs, and the next step is to fit them to the coil. Before doing this, a brief explanation of what a Crookes' tube is may be desirable. Many years ago, one of the most popular exhibitions of electricity was the passing the induced current through a tube or bulb greatly exhausted of air or other gas. The tube had a piece of platinum wire fused to each end, and a current that, as a spark would only pass through, say, an inch of air, would pass through several inches when the gas was rarefied. In the course of his molecular investigations, Mr. Crookes experimented with such tubes with greatly increased rarefaction. The visible glow throughout the tube gradually diminished, till, when a certain point of exhaustion was reached, the current would scarcely, if at all, pass, and the uniform glow was succeeded by a luminosity at the cathode pole. Emanating from this pole were certain remarkable radiations, one property of which was the cause of the Röntgen rays.

Before attaching a tube, the current should be turned off by means of a little adjunct to the coil termed the commutator. And this shutting off the current should always be done before in any way touching or altering the secondary wires. Quite apart from the question of the pain of a shock, it might easily cause the hands to jerk and disarrange or break the valuable tubes. The further—and indeed, the original—use (whence its name) of the commutator is to reverse the direction of the current.

As to the tubes themselves, their variety is bewildering; what with dealers' and actual makers' patterns, it will be difficult to effect a choice. Quite recently Mr. Gifford, one of the earliest and most successful workers in this country, writes to *Nature* that he has obtained the best results with the earliest shape of tube he tried, while the bulk of other writers recommend a so-called "focus tube." Though Mr. Hicks has kindly made for me to try one of the form Mr. Gifford recommends, my own preference is for a focus tube. The pattern devised by Mr. Jackson gives decidedly the sharpest results, but, in my experience, needs more coil power than the other cheaper form almost cylindrical in shape. Mr. Hicks, the original maker of Crookes' radiometer, makes about eight different patterns of tubes; of those I have tried the greatest success has been with his focus tube of truncated cone form.

The first thing to be done is to fix the Crookes' tube in a steady position, which can be done by any extemporised holder, or by the aid of a laboratory tube-holder. A certain amount of firmness is desirable, for, though it may be suspended from a loop at the end of one of the secondary wires, in which case the latter must be secured to a holder, and the loop be close to the support, it is most desirable to prevent any swinging. If the tube is not stationary, the rays are naturally emitted from a larger area, and such an object as a hand will, in consequence, have the bones represented less sharply, through the penumbra being wider.

The tube being fixed, and one end connected with one terminal wire, it only remains to attach the other terminal to the second electrode of the tube, and turn the commutator so as to allow the current to pass. Immediately the luminosity in the tube becomes visible the green glow of the cathode should be at the wide circular metallic disc. If it should not be so seen, the current should be reversed by giving the commutator a half turn, when the glow will be transferred to the disc, which is now the oft-quoted "cathode," whence the rays have their original cause, though where they actually start from is still not decided. The cathode rays seem first to need to impinge upon some substance before the Röntgen rays are obtained. It is stated that Edison, by means of a long metal tube

* Continued from page 276.

and a fluorescent screen, has tried to locate them, and found them to come from all parts of the vacuum tube.

It is necessary to give certain cautions to safeguard the tubes.

First, it must be observed that the two loops of thin wire fused into the tube must be most carefully treated, or they will either be broken off short, or the glass tube at the point be split or cracked, an event which would ruin the tube by the gradual inflow of air. I can speak feelingly on this point, for I had a magnificent collection of the old vacuum tubes, nearly a score in number, and I lent them to a scientific friend, whom I thought I could safely trust to handle them with care. When he returned them, nearly every tube was ruined from either this cause or another which I will mention.

Secondly, if the tubes be not carefully and sufficiently attached to the secondary wires, it may happen that one wire will spring away, and, if in springing the uncovered end of the wire should touch, be it ever so lightly, or approach at all closely the walls of the bulb, it is very probable that a spark may pass from it to the tube, and, if it does, the tube is irretrievably damaged, as the spark would pierce a microscopic hole, which would let in the outer air. One of the Crookes' tubes I have been experimenting with "gave out" in the middle of an exposure for no apparent reason. I can only imagine that a spark passed from the supporting wire to the glass, and thus pierced it.

The deduction from this recountal is obvious. The leading wires should only be uncovered for a very slight distance from the loop that attaches them to the tube, there will then be little danger of "sparking."

In attaching the wires to the tubes they will be found to behave in a most refractory manner, springing away and straining the tube electrodes when threading them. This is best avoided by using covered wires as thin as possible, not thicker than No. 24 gauge, and they may be bent into a spiral by wrapping round a long pencil, which is then removed. A wire so shaped has less spring in it. It will avoid strain if the end of the wire have a loose link of covered wire, making a sort of chain.

There is nothing now to be done but to place the object to be photographed upon the sensitive plate. This should be placed not in a dark slide, but inside a bag of three-fold black paper, and the object to be electro-sciographed put upon the paper. Now, though it is difficult to fix upon the exact point of area of radiation, it is certain that, the further removed the tube is from the object, the sharper the shadows will be, and, if the power of the tube sufficed, a distance of twelve or eighteen inches would enable the shadows to be beautifully clearly defined. This, however, is not a very practicable distance, for it has been estimated that the actinic action decreases about as the square of the distance, so that for twelve inches the exposure needed would be sixteen times as great as at three inches.

In taking electro-sciographs of the hand or foot, the position of the tube must be regulated by what point is most likely to be needed in the sharpest definition. If the tube be suspended over the knuckles, the division between the bones will be clearly shown; if over the wrist, it is obvious the rays will pass across the separating space, and no line between the finger joints will be perceptible. The further the tube is removed the less, of course, do these remarks apply.

Again, it will be found that some hands will not lie flat on a plane surface, the fingers will spring up and form a shallow arch. Clearly, the bones would not be so sharply defined. If it be a case where sharp definition is wished for, the hand should be bandaged flat to the plate. The rays will pass through the bandages and act on the plate as though they were absent.

A word or two about price of apparatus may be useful. A recent estimate of the Editor, in reply to a query as to the cost, puts 23*l.* as the expense of an outfit. For that sum a very superior outfit can be obtained, and a very good one for much less. I have three coils, and I find that from Griffin's giving a four-inch spark, though nominally only a three-inch, capable of very good results. Its price was 9*l.* A battery of five Grove cells and stand may be put down as 45*s.* Hicks' price for a focus tube, 25*s.*; wire leads, acids, and mercury, say, another 5*s.* Total, under 13*l.*

I am particular in giving my own experience, as all the facts and prices may be relied upon; and, as Röntgen-ray work naturally falls into line with usual photographic practice, I am hoping that what I have written may be found useful by brother practitioners. Any point that I have not made clear I shall be pleased to elucidate *through the columns of this Journal*, and not by private letters to unknown correspondents. As I have before narrated, I have suffered, and thanklessly so, much loss of valuable time through queries from all parts of the world, sent to me by post from perfect strangers, that I have to make a point of declining to reply except to personal friends.

G. Watmough Webster, F.C.S., F.R.P.S.

CARBON OR AUTOTYPE PRINTING.

[Newcastle-on-Tyne and Northern Counties' Photographic Association.]

There are so many printing processes from which to make a choice, that the amateur photographer is puzzled to select the best from the multitude. In the bulk of these printing processes the image is formed by the action of light on a salt of silver contained either in albumen or, as now more generally used, in gelatine. These silver prints, if very carefully made, and very thoroughly fixed and washed, will last for years; but how often do we see prints made in this manner showing signs of fading and the whites going yellow. The silver salts contained in the paper are so sensitive to the action of light, dampness, fumes of sulphur, &c., that we can hardly class silver printing amongst the more permanent processes.

In my opinion, having tried nearly every process of printing, there are only two ways of making a really permanent picture. The first is the platinotype process, and the other is the autotype or carbon process. Of the two the platinotype is the easier and more quickly done, but the range of tone is limited to black and a very doubtful sepia tint. But the great enemy to platinotype printing is dampness in the air. The paper has to be kept in tubes containing dried chloride of calcium to absorb moisture, and, if printed on a damp day, the picture comes out flat and completely spoiled. In the carbon process you have none of these drawbacks; you can procure the tissue either in the sensitive or in the insensitive state, and of a great many different colours and shades of colour. Those most commonly used are engraving black, warm black, sepia of different shades, green for sea views, standard purple for portrait work, red chalk, and various shades of brown and chocolate are also obtainable.

Before describing the manipulations required to make an autotype picture, we will consider, in a few words, the action of light on the tissue. When a solution of gelatine is mixed with a solution of bichromate of potash, and exposed to light, the gelatine is turned into an insoluble compound. The autotype tissue is simply paper coated with gelatine in which is impregnated the colouring matter in an exceedingly fine state of division. The tissue is sensitised in a solution of bichromate of potash, and, when dry, is exposed under a negative. The light acts through the negative, and, as more gets through in some places than in others, you get the tissue rendered more or less insoluble, through all the gradations of the negative.

In the year 1864, Mr. Joseph Swan, of Newcastle, following on the lines of previous experimenters, succeeded in working out the first practical method of carbon printing. He took out a patent for the process, which was briefly as follows: A sheet of glass was coated with a film of collodion, and then, with the pigmented gelatine, this film of gelatine collodion, when dry, was stripped from the glass and exposed under a negative, collodion side next the negative; after exposure the film was coated with a solution of indiarubber, and transferred to a sheet of paper also coated with indiarubber. The two were then passed through a strong rolling press, to receive the necessary adhesion of the two surfaces. The picture was then developed with warm water in the usual way, and some of the finest carbon pictures which have ever been produced were made in this manner; the next step was the doing away with the glass plate and collodion. The pigmented gelatine was simply spread on paper, fastened to another sheet of paper with indiarubber as before, and after development gave excellent results, but, of course, reversed.

About four years after (in 1868) a Mr. Johnson patented the process as now worked. He found out that no indiarubber solution or other cement was necessary to stick the tissue to either a temporary or permanent support, provided the support used was impervious to air and water, and that, by simply applying the wet tissue to such a support and rubbing down into contact, it adhered firmly by atmospheric pressure, just as a boy's clagger (I believe you call them in this part of the world) sticks to a paving stone. The process as now worked is exceedingly simple; the tissue is exposed, squeegeed on to a piece of specially prepared paper, placed in hot water, after a few minutes the paper backing is pulled off, the picture is then developed with warm water. The print is reversed if it has been made from an ordinary negative; this is of very little consequence if the negative has been taken simply with the object of making a picture; but, if the negative is a street view or a view of a place, it would not do at all. In this case the exposed tissue is developed in a temporary support either of prepared paper or opal, and then transferred to a final paper support.

I will now run through the various processes necessary to make a finished autotype picture. To begin with, the tissue can be obtained ready-sensitised, and, for any one who intends doing a dozen prints

straight off, this is the better way to buy it. The price is the same, either sensitive or insensitive. But some of us may want a few copies now and not want to print again for a week or two. In this case, the tissue must be purchased in the insensitive state, as it gets quite insoluble after ten days or a fortnight when sensitised, and is therefore useless. Suppose we have some insensitive tissue to sensitise; it is put into a bath composed of—

Bichromate of potash	3¾ ounces.
Liquor ammoniæ	880 millimetres.
Water to	2 quarts.

Be careful to brush air bells off both back and front of the tissue, and allow it to remain in the solution for three minutes. It is then removed and squeegeed on to a piece of glass, to remove the superfluous moisture, and hung up to dry.

We now have the tissue ready for exposure in printing frame. The negative, however, must be provided with a "safe-edge" first. The safe-edge is necessary for this reason: most—in fact, nearly all—negatives have a margin of nearly clear glass round the image, and, if printed with this margin, a line of insoluble gelatine would be formed round the picture, which would in all probability peel off during development, and most likely bring a portion of the picture with it. The safe-edge is made by placing a border of black material round the negative, on the glass side. It is important that this be done on this glass side, not the film side, of the negative. Black varnish may be used to form the safe-edge, but I find a black lantern-slide binder, cut half width and gummed round, answers the purpose admirably.

The negative, provided with safe-edge, is now put into an ordinary printing frame, along with a piece of the sensitised tissue, and exposed to daylight; but, as there is no image visible during printing, we must have something to judge exposure by. The instrument used is an actinometer, of which there are three kinds in general use—Johnson's, Sawyer's, and Burton's. You will find one tint is about the correct exposure for an ordinary negative; but, after a few trials, you will have no difficulty in giving the correct exposure. The action of light, having once started, goes on to a considerable extent, so that, if a print is put out late in the day, and you see by the actinometer that it is underprinted, if put on one side and developed next morning, it will generally come out fully exposed.

We now come to development of the latent image. After exposure, the tissue has become more or less insoluble, according to the light which has found its way through the negative. The whole of the gelatine in contact with the negative has been rendered insoluble, and a good deal of the gelatine in contact with the paper, and which the light has not reached, is soluble, and it is by washing this soluble matter away that the picture is revealed from the dark mass left after the backing is removed.

We have now got to the stage in the process when it is necessary to decide whether the picture is to be reversed or in its proper position. If it makes no difference whether the print is reversed or not, we mount the tissue on a piece of single transfer paper; but, if it has to be finished the correct way, it is mounted on a temporary support, of either opal glass or a specially prepared paper support. I prefer the opal, as I find the paper support gets very much stained with the bichromate solution, and has to stay a very long time in the alum bath before the yellowness is removed, the temporary support, whether of opal glass or paper, is prepared by rubbing over it a waxing solution composed of—

Yellow wax	6 drachms.
Yellow resin	2 ,,
Turpentine	1 pint.

It is as well to wax several glasses or papers, and, when dry, put them away ready for use.

Now, having decided which support is to be used, we proceed to mount the tissue. Immerse the tissue in clean water, and also the support; the tissue will curl up slightly as it absorbs moisture, and after a few moments begin to flatten out again; when you notice this flattening out, it is the correct time to take the tissue and support out of the water, and, laying them on a flat surface, they are squeegeed into close contact; it is then put between blotting-paper under a weight, and left there for a short time, after which it is transferred to the developing tank, containing water at 110° Fahr., and, after a few minutes' soaking, the paper is peeled off the back, and the tissue washed with the water till all the soluble matter is removed; the picture is then finished, and is placed in cold water to stop any further action, then transferred to a bath composed of—

Alum	½ pound,
Water	1 gallon,

and left there till any yellowness is removed. This alum bath converts the gelatine into an insoluble parchment, and renders the pictures absolutely permanent. After leaving the alum bath the print is rinsed in water and hung up to dry, and, if one tissue was mounted on the permanent support, it is finished, and can be trimmed and mounted in the ordinary manner; but, if we began the operation by mounting on a temporary support, it must be transferred to the final support. This can be done whilst the picture is wet, but I think a beginner has a better chance of success if he allows the print to dry. A piece of final support is soaked in cold water, and then passed through a bath containing water at 120° for a few moments, and squeegeed on to the picture. They are then placed between blotting-paper under a weight, and left for a few hours, after which the mounted pictures are placed in a warm place, and, when perfectly dry, the final support is stripped from the temporary one, and brings the picture along with it in its proper position.

This process may also be used for making transparencies, lantern slides, &c., and, for making enlarged negatives from small ones, it is much better to make a carbon transparency than a gelatine one, as there is no grain in the carbon tissue.

For making transparencies, a piece of clean glass, an inch larger each way than the negative, is coated with a solution of gelatine made thus:—

Nelson's No. 1 gelatine	6 drachms.
Water	1 pint.

Soak the gelatine in cold water, then dissolve with gentle heat, and add sufficient solution of bichromate of potash to make the solution sherry colour; the coated glass is then dried in daylight, to render the coating insoluble. The tissue is mounted on this glass and developed in the usual manner, but exposure must be carried very much further than for a print—in fact, a negative which yields a good print with one tint would require five or six tints to make a satisfactory transparency.

Having now briefly described the process, I will endeavour to demonstrate it from the time the printing is done, and, although you may think the process very complicated, I think, when you see it done, you will agree with me that it is simplicity itself. T. O. Mawson.

PHOTOGRAPHY WITH THE BICHROMATE SALTS.*

The fourth lecture, delivered on Tuesday, April 28, was by Mr. J. D. Geddes, upon the subject of *Woodburytype*, Mr. W. Thomas presiding. The lecturer said the process was patented in 1864, and it was curious that it had continued up to the present time to be worked almost exactly in accordance with the details given in the patent specification; although nearly all methods of photo-mechanical printing had in some way advanced since their inception, Woodbury had had the genius necessary to enable him to place upon the market a finished and complete process, to which all the skill and research of later years had scarcely been able to add a detail. The first operation is the preparation of a film of gelatine sensitised with bichromate of potash, to which is added some substance to make it pliable and to it keep from breaking under the strain which it must afterwards undergo. The gelatine solution is coated on a collodionised glass, from which it is stripped when dry, and the film is then ready for exposure under a negative; as the film is of appreciable thickness, printing must be by direct light or the definition will be impaired. After printing, the film is cemented with indiarubber solution to a piece of thick glass, and placed in constant changes of hot water for five or six hours to remove the soluble portions, and then soaked in methylated spirit, and allowed to dry spontaneously. When dry, the film forms an absolutely incompressible relief, although feeling as soft as a piece of silk, and it is then placed between a polished and case-hardened steel plate and a sheet of hard rolled lead, the whole being subjected by means of a hydraulic press to a pressure of from 2000 to 5000 pounds per square inch, by which means a mould of the relief is formed in the lead, from which the final prints are produced. For printing, a solution of gelatine is made, of about twenty-five grains per ounce, with which a pigment is added; a pool of the mixture is poured on the mould, a sheet of paper placed upon it and the lid of the printing press brought down and pressure applied; the pigmented gelatine is thus squeezed over the entire surface, that remaining in the depressions of the relief becoming attached to the paper, and the remainder being squeezed out at the sides. In a few minutes the gelatine sets, and the paper bearing it is then removed and dried, and, after treatment with alum to harden the gelatine, the print is ready for trimming and mounting. The mould is lubricated before printing with a mixture of olive oil and petroleum, and the paper requires to be waterproofed with a varnish of shellac and borax, and afterwards rubbed over with an emulsion of gelatine and shellac to give it a tooth and prevent the image splitting off. There are two drawbacks to the process, in that the prints require to be mounted, no method of printing with a clean margin having been discovered, and it is impossible to get a pressure sufficiently even to squeeze out the ink over a large expanse of white. Mr. Geddes referred briefly to the modifications known as Woodbury-gravure and Glyptotype, and exhibited a number of slides illustrating the application of the process to lantern-slide making, specimens of sensitised film, metal moulds, printing papers, and finished prints in various colours.

Mr. Bolas passed round for examination a Stannotype mould and print made by Mr. Woodbury, and gave some historical details of the process, and after some discussion a vote of thanks was passed to Mr. Geddes, and the proceedings concluded.

On Friday, 1st instant, Mr. W. T. Wilkinson lectured on *Photo-lithography* and *Photo-zincography*, both of which processes he demonstrated. The requirements for a good photo-litho transfer were that each

* Continued from page 283.

line should be sharp and solid, and that, when damp for transferring, there must be little or no relief, while the gelatine coating must absorb sufficient moisture to cause it to adhere to the stone the first time it was pulled through the press. Double transfer carbon paper formed an ideal paper for the process, and should be sensitised in a mixture of white of ten eggs, water thirty ounces, and two ounces of a saturated solution of bichromate of potash. Exposure should be timed by an actinometer, and when printed the transfer must be inked up with a glue roller until there is a thin and even film of ink all over it; after soaking in water a short time, the ink is rubbed off the unprinted portions, and the transfer, after drying and again damping, is ready for laying on the stone. The direct method of printing on zinc was next described, and also half-tone photo-litho, and the production of collotype and screen grains. For photo-zincography the prepared zinc plate, sensitised with bichromated albumen, was printed and inked up as in litho work, and after drying the image was dusted over with finely powdered dragon's blood, which was melted by heat, and, becoming incorporated with the ink, gave a good resist. Referring to the fish-glue process, Mr. Wilkinson had found that a very bad sample of gum, dissolved in water to make a solution of the consistency of condensed milk, and mixed with albumen and sensitised with bichromate, enabled one to give a very short exposure, and could be carbonised without making the metal so brittle as in the fish-glue method. He thought that fish-glue and gum were the two best things at present; and, in his opinion, the fish-glue process, either on zinc or copper, gave a better reproduction of the fine half-tone in a photograph than any other method he knew of. Various modifications of litho and zinco work were alluded to and briefly outlined; and the audience made up in attention for the paucity of its numbers.

Friday, May 8, *Process-work Applications*, by Mr. W. T. Wilkinson. Syllabus: Photo-lithography, in line and half-tone—photo-zincography, in line and half-tone—swelled gelatine—wash-out gelatine—photogravure—dusting-on process—the various bichromates—a new application.

CAMERA CLUB CONFERENCE.*

The Conference was resumed on Tuesday evening, the Earl of Crawford, K.T., in the chair, when Mr. J. W. Gifford gave a demonstration of

The New X Ray Photography.

He said he had obtained his best results with accumulators with a ten-inch coil, and with accumulators giving ten volts four ampères were quite sufficient, and answered better than large accumulators brought down by resistance. He usually employed a hand dynamo giving ten volts, and wound with No. 12 wire. He found he could work a ten-inch spark coil, and get a very long spark from the Tesla apparatus with four two gallon size Leyden jars; but, for ordinary purposes, it was sufficient to use two of the jars, and two half-pint Grove's cells. A number of vacuum tubes were exhibited, and he showed lantern slides of several of his results. Some fluorescent screens were also shown and tested, Mr. Gifford stating that he had found potassium platino-cyanide preferable to tungstate of soda for this purpose.

The Chairman, Captain Abney, the Rev. F. C. Lambert, Mr. Stanley Kent, and others, made some remarks, and, a vote of thanks having been accorded to Mr. Gifford, Mr. Frank M. Sutcliffe read a paper on

Pictorial Photographic Portraiture.

Many years ago, he said, there were two children born to Photography, and, though they were well able to earn their own living soon after they were sent out into the world, the higher education of both was for a time sadly neglected. One of the sisters, whose name was Landscape, had, however, been taken in hand by some members of the Club, and her education was now so complete, that she was acknowledged to be fit to move in the best society; and the object of his paper was to arouse a like interest in the higher education of her backward sister, Portraiture. He did not agree with those of his brother professionals who thought it a good job that amateurs generally fail when they attempt portraiture; in fact, his opinion was that portrait photography would get no "forrarder" till amateurs mastered it. It was because the amateur could afford to disregard the conventional idea of what a good photograph is, or ought to be, that he thought salvation would come from him. Most of the conventional ideas of what a good photograph is were based on rotten foundations made of lies, such as retouching, imitative accessories, sham landscapes, trees, and plants. The amateur could trim his prints as the subject required, and could take portraits with a diffusion of focus which would ruin a country photographer's reputation in a week. Twenty years ago, Mr. Ruskin told the lecturer that he thought all photographers over-exposed and over-developed their plates, and so lost much of the subtle half-tone in the lights, upon the delicate rendering of which the poetry of portraiture depended. Simplicity, more than anything else, distinguished a pictorial from a commonplace portrait, simplicity of treatment, subject, dress, background. Next to simplicity, truth; don't dress your friend as an Italian brigand or an American cowboy, even if he has bushy black eyebrows and a fierce moustache, but take him as he is. One of the greatest secrets of successful portraiture is to let the sitter alone and let him do the posing. The use of reflectors was

* Continued from page 284.

discouraged; but, if the light were filtered through tissue paper, the shaded side of the face would be more luminous, and the light might be concentrated or subdued where required. Everything must be subservient to the face. If it were not for the vagaries of our climate, the ideal studio would be an outdoor one, and, in diffused light or on grey days, certain effects next door to impossible in any glazed studio could be secured by those who would only look for them. Certain writers affected a very lofty tone when comparing painted with photographic portraits, and said that a painted portrait was made up of fifty different expressions of the sitter rolled into one, and that only the penetrating eye of the painter could see all this and reproduce it; but how was it that, when the painter went out of doors and painted nature, he tried his hardest to depict truthfully only one aspect of the scene? The photographer of the future would spend his youth in the study of art; the prices he would charge would make him independent of size; one sitter a day would give him employment enough, and his appointment book would be full for years in advance; but the world was not ready for him yet.

Mr. G. Storey, A.R.A., referred to an album of portraits taken by Mr. D. O. Hill some thirty or forty years ago, and now in the Club library, which he said were examples of artistic portraiture which he had never seen surpassed. Artists sometimes said that photography could not render the expression of a face, but there was a good deal of "rot" talked nowadays, and that sort of thing was part of it.

Mr. Craigie had found it impossible for any one to maintain a particular expression for more than a second or two, and he suggested that a very nice sort of composite expression was obtained by prolonging exposure, and allowing the sitter to vary his expression as he pleased.

The Chairman, as an amateur, said he recognised the importance of studying the sitter's features, but his experience was that his sitters would not give him a chance of doing so, they did not care about sitting a second time; it was unfortunate, too, that when one took a portrait of a beautiful lady, in whose good graces one wished to be, she would not speak again for a week. He moved a vote of thanks to Mr. Sutcliffe, and, the same being carried by acclamation, the Conference was adjourned.

On Wednesday evening, April 29, Captain Abney read a paper dealing with some applications of

Carbon Printing.

It was often considered, he said, that for certain puposes—such, for example, as the production of enlarged negatives—a carbon transparency was superior to one made by any other means. His experience was that, as a rule, carbon transparencies had a tendency to flatness, and the question then was, What could be done to improve them? A flat and feeble result could be much improved by changing its colour, either by means of a dye or by immersion in a solution of permanganate of potash, the latter imparting a rich brown colour, which produced a marked difference in the printing quality of the transparency. This method enabled one to reproduce a negative of satisfactory printing density from a thin and flat original, first making a thin carbon transparency and intensifying it to the necessary extent by means of permanganate solution. Spoilt celloidin films, coated with gelatino-bromide of silver, could be utilised for the production of transparencies by immersing them in a solution of bichromate, drying, printing through the back, and developing with hot water, a transparency in bromide of silver being thus obtained, which could be intensified to any degree by treatment with an amidol developer, and the image could be modified locally by brushing with hyposulphite of soda. Referring to the continuating action of light in carbon tissue, Captain Abney said that he had, many years ago, discovered that tissue which had received only one-fourth of the normal exposure would be fully printed if kept in a damp atmosphere for about fifteen hours before development; and, further, that the scale of gradation was not so great as in prints fully exposed and developed immediately. A soft negative could thus be made from a hard one by partially exposing carbon tissue, and developing after the lapse of some hours. Chromate of potash was nearly as sensitive to light as the bichromate, photographs of the spectrum taken on plates treated with the chromate showing greatest sensitiveness in the green and green-blue. In winter, carbon printing was quicker than silver printing, which was most sensitive to the extreme violet. The strength of the permanganate solution, which had been alluded to, was immaterial, the extent of intensification depending upon the time of immersion.

Mr. L. Warnerke said that carbon prints could also be intensified with gallic acid and an iron salt, which gave exceedingly fine gradation. In the event of over-intensification with permanganate, the image could be reduced by dipping in oxalic acid, which slowly dissolved the peroxide of manganese which was deposited on the film.

Captain Abney, in reply to questions, said some gelatino-bromide films were apparently insoluble, but the addition of five drops of caustic potash per pint of the water used for development rendered it easy to wash out the unaltered portions. Films treated with permanganate dried the same colour as they appeared when wet; sunlight had no bleaching effect upon films so intensified.

A vote of thanks was accorded to Captain Abney. Dr. C. S. Pateison read a paper, illustrated by a series of lantern-slides, upon the subject of *Photographing of Fish*, for the delineation of natural history specimens in a manner which should be of service to scientists. The method

generally adopted for making representations of such subjects was careful scale drawings by hand and engraving; the work had to be done by the eye and the hand, both of which were liable to error, it involved a great deal of time and labour, and was often entrusted to persons who were absolutely ignorant of scientific knowledge. For such drawings the subject had to be preserved in spirits, which altered the structure and destroyed the colour; and, owing to the difficulty of getting the pictures made, many rare specimens were not drawn at all. The chief advantages of photographing in this connexion lay in the facts that the scientific observer could make his own pictures at a very small outlay, and that photographs of fresh specimens could be obtained without loss of time. It was to be hoped that the Museum authorities would follow the example of Sir William Flower, and call in the aid of the photographer, so that photographs could be secured immediately upon the receipt of specimens. To obtain successful photographic representations, the operator must possess a thorough acquaintance with fish and their structure, together with a knowledge of exposure and lighting, which was only to be gained by practice; he must be able to adapt himself and his apparatus to all environments, and at a moment's notice, and he must not have a sensitive nose. The camera should be capable of long extension, and in order to facilitate measurements, an inch scale should always be included in the picture. As to the lens, the chief point to remember was that the longer the focus the less would be the distortion between the various planes; a vertical stand was very advantageous, as fish were slippery and glistening. Isochromatic plates were recommended, and a useful size was made by cutting a 12 × 10 in halves, so as to get a 15 × 5, most fish being three times longer than deep. With regard to screens, the tint must not be too dark, or colour values would be over-corrected; the colours were not those of the spectrum, but were mixed with white light, and the correction required was frequently much less than appeared to the eye to be necessary. A series of slides was exhibited showing representations of fish skeletons, obtained by Professor Röntgen's method. The exposures were made with three-inch sparks, the tube being five inches above the object; it was found that the bones did not stop the X rays, but only impeded them, and that, by over-exposing, the thicknesses of the bony strata were shown, and two or more layers of bones could be differentiated.

The Earl of Crawford, as a Trustee of the British Museum, said the question of the appointment of an official photographer had received a good deal of consideration, but the great difficulty which the Trustees had to contend with arose from the action of the Treasury. A very fine catalogue of British fishes had been issued by the Museum, but the preparation of photographs for such a large work would hardly be practicable, as a considerable proportion of the specimens were preserved before they were received. He had been agitating for some time for a Government laboratory to be attached to the Museum, but the Government did not seem inclined to spend much money on the institutions they were supposed to keep up.

Dr. Paterson said he did not wish to convey the impression that photography was not useful in the case of preserved fish; if the draughtsman could draw as well as he did from such specimens, certainly the photographer could do the work better, and quicker, and cheaper. Government laboratories were greatly needed where men trained to the particular work might be available at a moment's notice.

The Chairman (Captain Abney) remarked that he was glad to see that something really useful was being done in the way of photography by means of the X rays. He proposed a vote of thanks to Dr. Paterson, and the motion being carried, the Conference adjourned.

At the sitting on Thursday, April 30, Mr. C. H. Bothamley read a paper entitled

Some Points concerning Silver Prints.

He detailed a number of experiments undertaken for the purpose of ascertaining the manner in which a combined toning and fixing bath acts, and determining how much of the silver compound produced by the action of light remained in the print in its original condition; how much, if any, was converted into silver sulphide; how much gold was deposited, and whether any lead or lead sulphide was deposited on the image. He had adopted the plan of investigating the action of the combined bath without any gold, taking hypo and alum for one set of experiments, and hypo and lead for another set, and he had thus discovered the cause of a sort of pseudo-toning which had taken place in certain faded prints which had been brought to his notice, and upon which apparently no gold had been deposited. If an ordinary silver print were placed in acidified hypo solution, it would first be fixed, and would afterwards acquire a brownish-yellow colour which had been called "sulphurisation;" the fixing and sulphurisation did not proceed simultaneously, as was often said to be the case. Solutions of hypo and alum behaved in precisely the same way; a gelatino-chloride print removed from such a solution after four or five minutes' immersion had just the same appearance as one fixed in a slightly alkaline bath, but, if allowed to remain in the mixed solution for a rather longer time, the print was in outward appearance the same as if the image had been toned by gold. The sulphurisation was generally said to be due to nascent sulphur, but experiments proved that there was no difference whether the hypo had been acidified for some time or was freshly acidified, or whether it was freshly mixed with alum or kept before use. It appeared from the investigations of various investigators that a very long time elapsed before the separation of sulphur ceased in acid solutions of hypo or mixtures of hypo and alum; and he had treated prints in such solutions nine months old, and which were perfectly clear and showed no signs of depositing sulphur, and the results were exactly as before, the prints first fixing and then acquiring a purplish colour. This appeared to prove that the change, whatever it might be, was not due to nascent sulphur liberated from the solution; it was perfectly clear, therefore, that a mixture of alum and hypo, even after all precipitation of sulphur had ceased, would so change the colour of the print that it might be supposed to have been properly toned without any gold having been deposited upon it. Solutions of hypo with acetate or nitrate of lead were not acid, but slightly alkaline, and produced pseudo-toning of a similar kind to that caused by hypo and alum or acidified hypo. A mixture of hypo and lead nitrate deposited its sulphide of lead much more completely than hypo and lead acetate. The cause of the apparent toning in the absence of gold was said to be due to sulphurisation, a term which implied that the image was to a large extent converted into silver sulphide, but he had found that nothing like complete conversion took place, and that there was comparatively little sulphurisation. Owing to recent researches, our knowledge of the nature of the sub-salts of silver was more definite and extensive than it was a few years ago, and there seemed to be every reason for the conclusion that the dark purple substance formed by the action of acidified hypo, or hypo and alum, was not silver sulphide, but silver sub-sulphide. The main points, Mr. Bothamley said, in his fragmentary series of experiments, were that even in the absence of gold pseudo-toning was caused by the presence of alum or a lead salt or both together; that the pseudo-toning was not simultaneous with, but subsequent to, the fixing action of the hypo; and that in all probability the purple colour was due to the formation of silver sub-sulphide, a compound the stability of which helped to explain why images of that kind were much less permanent than those toned and fixed by separate operations.

The Earl of Crawford asked whether Mr. Bothamley's remarks were to be taken as arguments against the combined bath?

Mr. Bothamley said yes; but only if such a bath contained lead or alum.

Mr. Lyonel Clark asked whether the formation of sub-sulphide would tend to stop gold toning?

Mr. Bothamley said he was not yet prepared to answer the question definitely, but it was extremely likely that such would be the case.

A vote of thanks having been passed to Mr. Bothamley, the concluding paper of the Conference was read by Captain Wilson Barker, R.N., the subject being

Clouds and Photography.

After showing a series of lantern slides from photographs of every variety of clouds, he said that probably the clouds of the greatest importance as weather indicators were more difficult to photograph than any other object. Cumulus clouds were easily photographed, but the delicacy of the finer varieties of stratus, and their tendency to get swamped by the powerful effects of the blue sky, rendered it very difficult to photograph them. One of the most successful devices was the use of a black mirror, and he had got satisfactory results by interposing a very thin film of mica between the lens and the plate. Success depended chiefly on the state of the atmosphere and the degree of illumination. He used a single wide-angle lens and a Ross U. S., but the result was about the same with either, and developed with hydroquinone. Photography had aided considerably in ascertaining the height and thickness of clouds, two cameras a distance apart being connected by a telephone, and two exposures being made simultaneously on the same cloud.

A brief discussion followed the paper, and, after Captain Wilson Barker had been thanked for his paper, the Conference closed.

On Friday evening the annual dinner was held at the Café Monico. Captain W. de W. Abney, (the President), who was in the chair, replied to the toast of "Success to the Club," submitted by Mr. F. M. Sutcliffe, and claimed that during the year the organization had made substantial progress both in scientific and artistic work. It had had a feast of radiography, and on the Club walls were some ghastly productions which he would personally rather not see there. He was not sure that any save accomplished physiologists should be allowed to use the X rays, for it was rather impertinent of a man to attempt to delineate something of which he knew nothing. On the other hand, he anticipated this usefulness from the discovery, that announcements of engagements in the morning papers would one of these days conclude with an intimation that the photographs of the skeletons had been mutually exchanged. Surely it was desirable that everybody should be tested as to whether they were sound in limb before entering the married state? He noticed from a visit to the Academy that the camera was being used by painters, especially for the adequate portrayal of animated street scenes, and he believed that more and more help in that direction would be demanded of an educational club like theirs. The toast of "The Visitors," proposed by Mr. William Clarke, was acknowledged by Dr. Richardson. Other toasts were "The Press," "The Ladies," &c., &c.

NOTES FROM THE WEST OF SCOTLAND.

Perhaps there is no other thoroughfare in the kingdom that can equal Sauchiehall-street, Glasgow, for its number of photographic studios. This street, which has now become one of the leading lounges in the City

on account of its being the main thoroughfare leading west, has within recent years assumed a very gay and busy aspect, and from morn till eve is always thronged with a large crowd of fashionably attired citizens and tourists. From a photographic point of view it is unique at the present moment, for it now boasts of no less than about a dozen of the leading studios in the City, all of which are congregated within a few yards of each other. In addition to which we have the extensive business premises of Messrs. Geo. Mason & Co., and shortly The Albion Albumenising Co. are to open right in the midst of this busy crowd of photographers also. Opposition certainly would appear the life of the trade here.

Mr. Paton, the creator of the Corporation Galleries, is receiving very gratifying support in the way of the collection that will be shown at The Camphill Exhibition this summer.

Some exceedingly interesting old relics of bygone photographic days will be on view, including most likely the first photographic lens used in Glasgow about the year 1840.

Hand cameras are very much in evidence this year again, and the light during the latter portion of this month has been very favourable for shutter work.

Mr. Alexander Robb of Gourock has been doing some surprising work with his shutter *under cover*, the amount of detail he can coax out of a plate in development has astonished not a few, who thought they knew all about snap-shot work. Amidol is fast gaining in favour as a developer for short exposures.

CARDIFF EXHIBITION.

When the good burgesses of Cardiff decided to hold a big "Arts, Industrial, and Maritime" Exhibition, the Photographic Society in Cardiff who ere now have held very successful little exhibitions of their own, were asked to take the responsibility of a photographic section, to which suggestion the Society agreed.

Subsequently, however, so we gather, the general managing committee began to begrudge both the space and the money requisite, and the photographic committee appear, from first to last, to have had a very uphill and disheartening time, and finally found themselves quartered in two long widely separated corridors, with only side light, and not too much of that. Now, we know photographic Hon. Secs. are characteristically endowed with intense reserve energies, and in the present instance Mr. T. H. Faulkes seems to have accomplished great things, and with him worked the President, Mr. S. W. Allen, Mr. J. W. Jenkins, Mr. S. Williams, Mr. N. H. Kitchen, and others, so that, although brief time and small financial resources were allowed them, the two galleries possess a very creditable appearance, and a goodly number of exhibits have been got together.

Not the least difficulty which we encountered was having to report the Exhibition without a catalogue, the fronts of most of the pictures possessing no indication of title or authorship, so that the conscientious reporter had to unhang the pictures one by one to read the names on the back. This makes exhibition reviewing tedious.

It is only fair, however, to say that the omission of a catalogue was not the fault of the photographic committee. Mr. Hon. Sec. had sat up all one night to prepare the list, and had handed it in, but the first edition of the official catalogue came out minus even the merest mention of the existence of a photographic section in the whole building.

Clearly Cardiff wants educating a little. Of course, every man thinks his own particular sport, profession, or calling, the most important, and when a man is a great owner of collieries, or a great dock-owner, or shipbuilder, he cannot be expected to regard as of serious importance such a puny thing as photography; and perhaps that is how it is that the Cardiff Exhibition's strong feature is steamboats, guns, ammunition, model mines, and the like.

The first frame we were tempted to unhang to read its name on the back was *Sheep in Snow*, by Mr. W. H. Banks, which, though very nice, is hardly, we should have thought, the best in the class. Still, the Judges have seen otherwise, and given it the silver medal.

There are several nice little quarter-plate snap-shots by Mr. J. J. Jenkins, a Cardiff man, who takes the medal in Lantern-slide Class.

Fast Falls the Eventide, by Mr. Howard Esler, we remember to have seen before, and, whilst we admire it for some qualities, we feel sorry that its value is seriously marred by a figure which disputes chief attention with the boat stranded on the soft mud.

Mr. Charles Moss and Mr. Charles Job are both represented by several works shown last year in London, the former receiving a bronze medal for what we do not hesitate to call the least worthy of the things he shows. Mr. Moss can and does do some very capital work, and he has better pictures here than the winding road and dark masses of bushes and trees which the Judges have thought fit to award.

Mr. C. Job has a sheep picture, which, although high up, we climbed up to, and ascertained its title to be *Linfield, Sussex*, very pretty, bright, and well chosen.

Quite unconventional is W. Thomas's narrow upright print of a very grey, misty character, a sunset over some snow-covered ground. We cannot help feeling that this is a bit cut out of a larger negative, and, whilst trimming down is an excellent practice, it should never make itself felt.

In the Portrait Class, which is a large one, the silver medal is withheld, and two bronze medals given to Mr. Percy Lankester and Mr. W. J. Jenkins respectively, and a certificate to Mr. Smedley Aston.

The sort of education we have intimated as being desirable in Cardiff will not, we fear, be accomplished by the painfully commercial showcase style of some exhibits in the Portrait Class. Large stippled-up heads, sumptuous grey and gold enamelled frames, upholstered in crimson plush, and a similarly decorative (?) advertisement, containing showy portraits of fair ladies, the former having a great number of other frames of large silver prints, figures classically draped, and some —— well, the gallery was deserted, and last year's Salon has prepared us for a good deal.

Mr. Byrne of Richmond, has a large frame containing some thirty or forty exquisite child portraits, any one of which, if mounted alone, would be quite enjoyable.

Close at hand are some of Mr. Hollyer's finest works, which he has lent, and we hope Cardiff people will study these, and take their lesson to heart.

Admirably executed, and most ingeniously contrived, is the charming damsel who sails on the horn of the crescent moon, and for this and other works Mr. Samuel Allen, the President, is responsible, and is justly proud of.

Mr. Percy Lankester receives the silver medal in the *Genre* Class, and Mr. F. M. Sutcliffe, the bronze. Messrs. J. Chaffin & Sons, of Taunton, show a large number of silver prints which have an odd old-fashioned look, and here, too, are J. Coath's well-carried-out series of children, dressed in fancy costumes, playing a part, such as courting, reproving, &c.

H. L. Issenberg shows three bird studies in brown carbon, which, both in idea and conception might be very noticeable, but for Mr. Gambier Bolton's work which has spoilt one's taste for anything but the very finest animal studies.

In the Champion Class are a very fine lot of things. Mr. E. R. Ashton's *In Nubia* has, like all his Oriental studies, a peculiar and distinctive quality.

Here, too, are two tiny gems of landscape by W. B. Post; S. B. Bolas & Co's *Winchester Cathedral*; and Mr. Steiglitz's *Scurrying home*, seen last year at Pall Mall, has the honour of carrying away the gold medal.

Mr. Robert Terras's well-known *Ghost Story* is here, with several more of the same class, though hardly of the same merit, entitled *Holiday Morning*, *Grannie's Counsel*, *News of War*.

Messrs. Chaffin & Son have a *Grief* (No. 210), which is, in our opinion, far above anything else they show. It is a girl and dead bird, posed somewhat statuesquely against a quite dark background, and only fails being very successful for want of a little discretion in tinting down the masses of white drapery.

Mr. Bedwhar's *At the Fountain* will always be welcome, and Edgar G. Lee's *Castle Garth*, also *At the Smithy*, are both excellent.

Mr. W. H. Kitchen, an active member of the Cardiff Society, shows three good enlargements—*A Haymaker*, *Carnarvon Castle*, and *Village Smithy*.

Mr. Archibald Goldie has a clever little picture of a woman suckling a baby, which was medalled at Amsterdam. The subject, although one most difficult to treat, has been done cleverly, with good taste, and even with a poetical touch about it.

Architecture seems a large class, owing, no doubt, to the large size of most of the frames and the number sent in by each of several exhibitors.

W. D. Dighton, a local photographer, has a fine carbon enlargement of an interior of Cardiff Castle, and a number of silver prints of unequal merit.

S. B. Bolas & Co. send a big lot of large interiors, for one of which they receive the silver medal.

A remarkably fine photogravure is duly distinguished by a bronze medal. This is by Mr. Harold Baker; and an extra bronze medal goes to Mr. E. R. Ashton for an oriental subject.

Mr. T. H. Faulks is a very prolific worker, and occupies a great amount of space in the Enlargements Class with some excellent work. The silver medal for enlargements goes to a Cardiff man, Mr. W. H. Kitchen, for his *Anticipation*, a technically good enlargement from a football snap-shot, and the same exhibitor has some good marine enlargements. Bronze medal is awarded to S. H. Beale, of Banbury, and a certificate for *Alteryn*, by T. Mitchell.

The Hand-camera Class is very small, there being only three or four entries, and a bronze medal falls to the lot of Mr. W. Thomas, the silver medal being withheld.

The Lantern-slide Class, too, is not large, and the medal is given to Mr. J. J. Jenkins (Cardiff).

Some excellent X ray results are shown by S. W. Allen, and some photographs of geological formations by W. Norrie, both these gentlemen receiving special bronze medals.

Many fine examples are sent, "not for competition," by Messrs. F. Hollyer, Horsley Hinton, Ralph Robinson, West & Son, and others. Jesse Williams & Co., of Cardiff, show a large assortment of chemicals, apparatus, and sundries.

List of Awards.

Class A (Landscape and Seascape).—Silver medal, *Sheep in Snow* (No. 7), W. H. Banks; bronze, *Homeward Bound* (No. 32), Charles Moss; certificate, *Sunlight and Shadow* (No. 70), Charles Job.

Class B (Portraiture).—Silver medal, withheld; bronze, portrait (No. 85), W. J. Jenkins; extra bronze, *Gladys* (No. 101), P. S. Lancaster; certificate, study of a head (No. 103), W. Smedley Aston.

Class C (*Genre*).—Silver medal, *Natives of these Isles* (No. 149), F. M. Sutcliffe; bronze, *In Nubia* (No. 190), E. R. Ashton; extra bronze, Greek study (No. 143), F. L. Lancaster.

Class E. (Enlargements).—Silver medal, *Anticipation* (No. 348), W. H. Kitchin; bronze, *A Classic Corner by Severn's Side* (No. 330), S. H. Beale; certificate, *Alteryn, Newport* (No. 335), Colonel P. Mitchell.

Class D (Architecture).—Silver (No. 318), S. B. Bolas & Co.; bronze, *A Portico, Cairo* (No. 270), E. R. Ashton; extra bronze, *Warwick Castle*, photogravure (No. 277), Harold Baker.

Class F (Hand Camera, set of six).—Silver medal, withheld; bronze, W. H. Thomas.

Class G (Lantern Slides).—Silver medal, J. J. Jenkins; Bronze, C. S. Baynton; certificate, W. Pugh.

Class H (Champion).—Gold medal and shield, *Scurrying Home*, A. Steiglitz.

BIRMINGHAM PHOTOGRAPHIC EXHIBITION.

The increase in the number of outside exhibitors, the inclusion of a number of survey pictures of the county of Warwick, and the rearrangement of the screens bearing the pictures, makes this—the eleventh—the most imposing show the Birmingham Society has yet held.

As in previous years, we are struck by the large number of classes the works are split into, too many medals being offered; and, again, we earnestly suggest that the local Society might vastly increase the artistic value of their rewards by reducing their number. In the members' classes there are no longer the few workers standing head and shoulders above their fellows, but there has been a general levelling up, and, speaking generally, the competitions are keen, and must have presented considerable difficulty to the Judges, Messrs. Lambert, Gale, and Burt. Mr. T. C. Hepworth was to have acted as the third adjudicator; but, telegraphing his inability to attend, the well-known artist, Colonel Burt, was called in at the eleventh hour. The effects of the Salon with regard to frames and other matters would seem to be passing away, while the tendency to supplant the colder tones of platinotype by various colours, more or less pronounced, is another feature that forces itself upon one.

In Class I. (Open Landscape) the silver medal is awarded to W. T. Greatbach for a sunset effect, which is particularly noteworthy for its uniform excellence. It represents low-lying woods on the far side of a pool with fine clouds, which are reflected in the still water. We should say this is a picture produced entirely at one exposure, so well does the lighting harmonise over the whole work. So strong was this class that the Judges awarded two extra bronze medals, one to a striking subject in which some Scotch firs on the crest of a hill stand in bold relief against a distant landscape, by F. Bolton. The second bronze goes to A. J. Jeffreys for a winter river scene, somewhat "tender" compared to surrounding works, but well worth the award. *The Mill on the Avon*, by C. S. Baynton, takes a certificate, and other notable works are shown by J. P. Croft, No. 9, *Departing Day*, by Greatbach, *Auld Kirk Yard*, of John Stuart; while No. 66, *A Dutch Waterway*, by W. J. Warren, we hardly consider a success.

Class II. (Seascapes, Open).—As might be reasonably expected at so inland a town, the exhibit in this class is small; but a local competitor, Mr. Smedley Aston, takes first with *Seawards*, a work of very considerable artistic worth, but perhaps too great a leaning to the fuzzy. Four marine studies in platinum, showing excellent work, by C. F. Inston, take the bronze, while No. 78, *Sunset across the Channel*, seems to be about the best of those that the Judges have passed over. The class shows good work though numerically weak.

Class III. (Open, *Genre* and Figured Studies) is a good strong class, and here again the Judges have awarded two extra bronze medals. The silver medal is taken by O. W. Huntingdon for *In an Attic*, a gracefully posed girl working at a spinning wheel, although the thought at once occurs that we should hardly expect a lady so dressed to occupy an attic. No. 122, a portrait study, secures a bronze medal; this is, we think, under a green glass, which gives a ghastly and unnatural effect to the subject. *After the Day's Work is Done*, by Greatbach, is a new rendering of a familiar subject, good in arrangement, but a tendency to heaviness; *Domino* and *Dora*, two fine studies of children, by Ayton, three figure studies at Cairo, by Ashton, *Holiday Time*, by Fred Coop, and *Pierrot Reminiscent*, by I. Cruwys Richards, are all worthy of highest commendation.

Class IV. (Open, Enlargements).—Silver medal, S. E. Wall, for a fine work on tinted paper; a seascape of stormy character take the first award, backed up by an Alpine scene by W. C. Crofts which takes the bronze. *Cloisters at Gloucester*, by C. S. Baynton, is a good work, also the *Banqueting Hall at Haddon*, by Croft; *Nearly Home*, a seascape by J. B. Johnson. No. 183 *Smoke-circled Sky*, by McNab, astonished the Birmingham public accustomed as they are to smoke. *A Sussex Lane* would seem to be constructed of the same material.

Class V. (Open, Lantern Slides).—A set of architectural subjects by W. H. Bagnall worthily take first place; while another architectural set by E. R. Bull take the second award; H. O. Isaac takes a certificate. The following classes were open to members of the Society only.

Class VI. (Clouds) is usually a very strong and effective class at Birmingham and we were, therefore, surprised at the smallness of the entries; the medal is withheld and the award of a certificate made to P. T. Deakin, although we think there is a little too much landscape for a cloud class, No. 360, by Longmore, being rather more to our fancy.

Class VII. (River Scenery) is scarcely up to the form we find at Birmingham. *An Autumn Morning*, by W. S. Aston, takes the silver medal, although we cannot quite approve of the Judges' choice. *Dawn*, by C. S. Baynton, takes a certificate, and is in a similar key. No. 374, by Greatbach, is a bright summery bit on the Stow.

Class VIII.—Home Portraiture is more than usually successful as a class. No. 410, a fine head, good in pose and lighting, by Smedley Aston, wins; the same exhibitor, also takes a certificate for No. 412; while T. Taylor and B. Moore also take certificates. Nos. 402 and 403, by I. Cruwys Richards, although not rewarded by the Judges, are excellent, while the work of W. P. W. Browne, Whitworth Wallis, and T. Taylor are also noteworthy.

Class IX. (Architecture, Exterior).—W. P. Greatbach adds to his laurels by the aid of the *West Door, Chester Cathedral*, and C. J. Fowler takes an award with *Compton Wyniates; Buildwas*, by Baynton, and an old gateway at Cambridge, by Underwood, are good.

Class X. (Interiors) is also taken by Greatbach with the *Cloisters, Chester*, this is followed by much other good work by Baynton, Deakin, and Moore.

Class XI. (Small Landscape) *After the Rain*, by J. P. Croft, a river bit of which more might be made, and *Marshland*, by P. T. Deakin, for first.

Class XII.—Instantaneous and Hand-camera Work is a weak class, the best being by Baynton, *Off Scarborough*, and a street scene on Lifeboat Saturday. The Flower Class is taken by W. Smedley Aston for a good set of three.

Class XIV. (Lantern Slides). The Judges gave W. Bateman and W. P. W. Browne as equal, C. J. Fowler and Baynton taking certificates. The Novices' Class is headed by Bateman with three fine enlargements in carbon of architectural subjects. C. H. Barnsley coming next, with R. Hemming third. Dr. Hall-Edwards takes a certificate for radiographs in Class XVI., and the three Warwickshire Survey Classes are won by Baynton, Greatbach, and Baynton, being followed by F. Lewis and Underwood. In addition to the competition work, there are a large number of prints of the Warwickshire photographic survey and shortly to be presented to the town. The Exhibition closes on the 9th, Lantern shows being given in the evening by Messrs. Wallis, Cossins, Ward, Baker, and Pickard.

THE W. H. HARRISON FUND APPEAL.

	£	s.	d.
Amount already acknowledged	54	11	0
J. G. Meyrick, Esq.		10	0
"A Junior"		10	0
Geo. Tapp, Esq.	5	0	0
	£60	11	0

Further contributions will be thankfully acknowledged by

Fredk. H. Varley, 82, *Newington Green-road, London, N.*

The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* Journal *useful and instructive.*

Toning Difficulty.—In the Answers to Correspondents column, last week, in reply to a query on the subject of toning albumen paper, it is suggested, if ready-sensitised paper is used, to try another sample. I should like to ask you, or any of your readers who may be able to give the information, whether there is *any* sample of ready-sensitised albumen paper that will tone as readily when it is a few months—or even weeks—old as when new. I am not asking for the name of any particular brand in order to give it a free advertisement, but simply for a statement of the fact, since, in my experience with, I think, all the best brands in the market for many years past, I have invariably found, however well preserved and whatever expedients were resorted to for that purpose, that the paper gradually becomes slower in toning, and loses its original power of taking a really good tone. Gelatino-chloride differs very greatly in this respect, and I have had prints on more than one of the popular makes, that, after lying untoned for months without any special care, have toned as quickly and as well as those newly made upon fresh paper. I would suggest that perhaps J. T. P.'s paper has been a long time either on his or the dealer's hands.—Red-gauntlet.

HALF-TONE SCREEN.—"I have purchased a half-tone cross-line screen, quarter-plate size, but the glass is much larger than that, and will fit neither quarter nor half-plate camera. I can, however, use a carrier, or adapter, with the latter size of camera, but what puzzles me is how to get the screen at the proper distance from the sensitive plate. I shall use dry plates, but, even if I place screen and plate in contact, the two will not go together into the slide, and, if I fix the screen outside and in front of the slide, the distance between it and the plate will be considerably over a quarter of an inch, and I am told it should not be more than three-sixteenths. How is it done?"—H. HARPER. You will have to provide a special slide or screen-holder, though a makeshift, described in another column, may help you.

BICHROMATED ALBUMEN PAPER.—CLONMEL says: "Mention was made by 'Dogberry,' a few weeks back, of albumen paper sensitised with bichromate of potash. I have tried this, floating the back of the paper on the solution, as he states, for two minutes, but the only result I can get is that the whole of the albumen is washed away after exposure, leaving no image whatever except that produced by the bichromate in the body of the paper. The sensitising solution, in fact, does not appear to penetrate to the albumen at all. Next I tried floating the other side, but sure, the albumen is removed before exposure. I did manage, by floating the back until the paper came limp and then just turning it over for a second, to wet the albumen to keep some of that on the surface, but it was only a thin, dull coating, and then, after exposure, never a bit of it would wash away, but what there was stopped there. I would be glad if 'Mr. Dogberry' could tell me where I am wrong at all."

DIFFRACTION GRATINGS.—J. HARRISON asks whether Lord Rayleigh's paper on this subject, read before the Camera Club Conference will be printed *in extenso*. He goes on to say: "From the abstract published in last week's issue, I do not gather whether the author gave working details of the different processes he mentioned, but it occurs to me that the successful employment of collodio-chloride upon glass for such fine work as gratings, with 10,000 lines to the inch, or one thousand for that matter, does not seem possible under ordinary circumstances. Setting altogether on one side the question of 'structure,' which is always very prominent in collodio-chloride, the crystallisation of the soluble salts in the emulsion—the direct printing method is referred to—would, one would imagine, utterly destroy all definition. Even with gelatino-chloride applied to glass, I should think the danger would be present; but, in the case of collodion, I do not see how it could be avoided. Can you, or any who have had experience in this direction, give me any information? also where can I find an albumen formula suitable for the purpose?' The paper will, no doubt, be printed in due course in the *Camera Club Journal*; when it appears, we shall probably have something to say on the subject.

DEFECTIVE COLLODIO-CHLORIDE. — J. P. writes: "I have a quantity of collodio-chloride emulsion made by myself from a formula I found in a back volume of the JOURNAL, and, although when newly made it printed quickly and vigorously, and toned well and easily, it gave a very thick and uneven film, running in ridges and even lumps, the coating having something the appearance of a newly ploughed field on a small scale. When immersed in water previous to toning, the paper curled up into a tight roll that was most difficult to unfold, and, when the emulsion was applied to glass, it was impossible to wash it without causing it to leave the plate altogether; but this was last autumn. A short time back, on turning out the emulsion for use, I found it had become solid, as if the ether and alcohol had all evaporated; but this I know not to be the case, as, independently of the fact that it occupies the same bulk as previously, the stopper has been tied down, so that evaporation is impossible. Can you suggest what is wrong, and tell me if I can restore the emulsion to a useful condition?" Without further data to go upon, we can only suggest, from the description of the behaviour of the emulsion when new, that an unsuitable pyroxyline has been used. The solidification is a very common occurrence when excess of citric acid is employed and more especially in the presence of calcium salts. We fear there is no way of restoring the emulsion, though perhaps some of our readers may be able to give advice.

CARBON PRINTING (To J. C.).—The reply of W. Benington to this query last week is, I venture to think, misleading, to say the very least. That "carbon requires a rather particularly plucky negative" is indeed news to me, and will be, I fancy, to most carbon workers of any experience. I am not prepared to say whether or not it is correct to say that it "will stand a greater amount of contrast than any other process," but it is a fact that it may be adapted to suit very dense, hard negatives, just as it may, by special treatment, be rendered suitable for extremely thin, soft negatives, such as would, with difficulty, be got to yield respectable prints by any modification of the albumen process. It is, I imagine, W. Benington who has failed to "study his text-book instructions," if he is really unaware that, by varying the strength of the bichromate bath used in sensitising the tissue, its character may be so modified that it is equally applicable to very dense or very thin negatives; and, years ago, I have often availed myself of this fact to obtain prints from negatives that were utterly useless with albumen. There is scarcely any printing method that is not, to a greater or less extent, capable of modification in this manner; albumen paper, gelatino-chloride, and collodio-chloride, can all be prepared to suit varying characters in the negative, but, in my experience, none possess greater or as great latitude, in this direction, as carbon, and I am surprised to see any one lay down the dictum that it *requires* a special character of negative, and more particularly a plucky one. If J. C. will reduce the strength of his sensitising bath from five per cent. (which I dare say he is using) to two and a half, or even one and a half, he will find he will get more brilliant prints from comparatively thin negatives. I have used a bath as weak as five grains of bichromate to the ounce, and, though the tissue is slower in printing, it gives results from thin negatives that would compare, at any rate, with gelatino-chloride; I have had no recent experience with modern collodio-chloride, so am unable to make any comparison with that.—SYNTAX.

Our Editorial Table.

THE "SENSIBLE" EXPOSURE NOTE-BOOK.

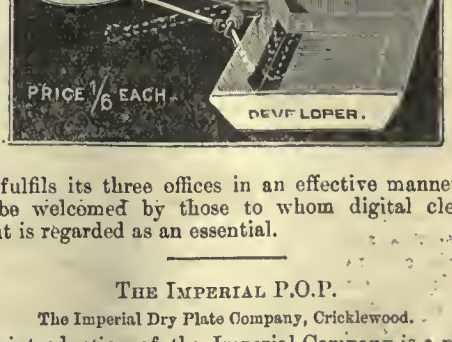
Archer & Sons, 43-49, Lord-street, Liverpool.

A NEAT little book, small enough to be placed in the waistcoat pocket, and giving on each page spaces for recording particulars of subject, slide, date, hour, light, lens, stop, exposure, plate, &c. It should be appreciated by amateurs.

THE "PRIMUS" COMBINED DISH-HOLDER, PLATE-LIFTER, AND ROCKER.

W. Butcher & Son, Blackheath.

THE illustration shows a little adjunct to the amateur's developing



outfit. It fulfils its three offices in an effective manner, and will, doubtless, be welcomed by those to whom digital cleanliness in development is regarded as an essential.

THE IMPERIAL P.O.P.

The Imperial Dry Plate Company, Cricklewood.

THE latest introduction of the Imperial Company is a printing-out paper which, judging by the specimen prints upon it that are before us, as well as some that we ourselves have taken, has been prepared with an eye to the production of the highest class of results a surface of this nature is capable of giving. The sulphocyanide toning bath is recommended. Nothing better in the way of gelatine prints could be desired than those yielded by the Imperial P.O.P. The tones are good, rich, and pleasing, and the paper therefore stands every chance of achieving success.

The Edwards' Developing Holder for Films.

B. J. Edwards & Co., The Grove, Hackney.

To the user of cut films, a neat and effective holder for the films as they pass through the operations of development, fixing, washing, and drying, is almost a necessity. It is well met in the Edwards'



holder. This is formed of thin metal with the edges turned over, and when the film is placed in position, development and subsequent operations may be proceeded with without disturbing the film. The holders are not damaged by the solutions, and, besides being useful, are decidedly cheap.

The Edwards' Camera Stand.

B. J. Edwards & Co., The Grove, Hackney.

The Edwards' Camera Stand is the practical and successful outcome of the attempt to combine in an instrument of this class the qualities of rigidity; rapidity and facility in fixing for use; lightness and compactness when folded. These ends have all been attained, the consequence being that in actual out-door work the handling of the stand cannot fail to be satisfactory.

Metal is employed in the construction of the stand; and the arrangement of the parts ensures the complete absence of vibration. The legs are made in U-shaped sections which fold one within the other. Instead of being fitted with the usual spike at the end of



the legs, they are furnished with rubber feet, which are very durable, and prevent slipping. Besides sheet metal, aluminium, at about double the cost, is employed for the sections, the joints of which are protected by tempered brass "shoes," which impart rigidity and strength.

The stand is made in various patterns. The larger illustration shows pattern C, with adjustable folding head, open and closed, the head being a permanent part of the stand. The second illustration shows the manner in which the stands are folded up. The camera screw having been slackened, the legs are brought side by side, and unlocked by pressing on the springs as shown; then, in pattern C, the three legs are folded section within section simultaneously, the head turned down and a compact parcel is formed like the illustration on the left hand of the first figure. This parcel measures 18 inches long by $2\frac{5}{8}$ inches wide, and $\frac{3}{4}$ inch thick.



We may add that, from practical trial, we could not wish to work with a more rigid, light, and generally serviceable camera stand.

The Canesi Wrapper.

L. Canasi & Co., 366, Old-street, E.C.

Photographers who are accustomed to send photographs through the post will find in the Canesi wrapper a good and simple means of packing the pictures for transit. The wrapper is of the usual form with projecting tabs, and the whole thing, when folded over and stuck down, makes both a convenient and protective method of sending photographs by post.

Professor Röntgen's "X" Rays.

By August Dittmar. London: Whittaker & Co., Paternoster-square.

An illustrated pamphlet of thirty-two pages, giving a brief account of Röntgen's experiments and the method by which radiography is accomplished. The introductory part of the pamphlet is devoted to a description of the nature and phenomena of electricity, and the work is calculated to be useful to those undertaking the new photography, and desirous of acquiring the necessary elementary electrical knowledge.

A Matt-grain Silver Chloride Paper.

C. A. Rudowsky, 3, Guildhall-chambers, E.C.

The leading characteristics of this collodio-chloride paper are that, besides having a matt surface, the paper itself is grained. It is made in four tints—white, sky-blue, sea-green, and brown, and thus a variety of pleasing effects may be obtained with it. Photographers will probably welcome the paper on this account. It is certainly an excellent and artistic printing surface.

News and Notes.

Mr. George W. Tottem, F.R.P.S., formerly Secretary of the European Blair Camera Company, has rejoined the staff of the Eastman Photographic Materials Company.

A copiously illustrated article dealing with the studies of Sir Edward Burne-Jones will form one of the chief features of the mid-May number of the *Studio*. The supplement accompanying this part will be an original etching by E. W. Charlton, A.R.E.

Royal Photographic Society.—Ordinary Meeting, Tuesday, May 12, at 12, Hanover-square at 8 p.m. *Dry Plates for Röntgen-ray Photography*, by H. Snowden Ward; *Notes on the Pyro-developed Image*, by Alfred Watkins; *A New Stripping Film for Negative Work*, by J. B. B. Wellington.

Mr. Lambert Matthews informs us that that the Scientific Hand Camera Company have entrusted him with the charge of their London office at 97, Queen Victoria-street, City. He will be much pleased to explain the special merits of the Scientific Camera to any who may favour him with a call at that address.

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, May 13. The evening is set apart for an Open Night, and members are requested to bring objects of interest to the meeting. Visitors are welcome.

A Photographer's Bankruptcy.—*Re* Abraham Booth (Nottingham).—Questioned by the Official Receiver, debtor said he was a photographer's assistant, living in lodgings at 2, Palin-street, Hyson Green. His liabilities amounted to 88*l.* 6*s.* 3*d.*, and he had no assets or property except 13*l.*, which he had deposited with his solicitor. He had been a photographer on his own account, and had commenced buiness about twenty years since at Belper. He was brought up to the business of a draper. From Belper he went to various places, and eventually he had a business on Mansfield-road, Nottingham. He went there about 1890, and remained there three years. Whilst he was in those premises, he carried on business with plant and furniture belonging to Mr. Wm. Jackson, his landlord. Afterwards he moved to 2, Palin-street. Miss Gertrude Fletcher joined him in the business before he went to Mansfield-road. She was the tenant of the house at Palin-street. His wife obtained a decree in the Divorce Court on May 7, 1895, and he was ordered to pay the costs of the action. The costs were taxed at 61*l.*, but he had paid none of them. He gave Miss Fletcher a bill of sale on his plant, furniture, and stock on May 11, to secure to her the sum of 107*l.* His indebtedness to Miss Fletcher was for 97*l.* She gave him 10*l.* at the time the bill of sale was made.—The Official Receiver: What became of the 10*l.*?—Debtor: I'm afraid I spent it rather recklessly. I spent it on brandies and sodas and cigars. Continuing, debtor said Miss Fletcher had had two legacies, one coming from an aunt in Derbyshire. After the date of the bill of sale he became Miss Fletcher's assistant in the photography business. She paid him 1*l.* a week and kept him. Miss Fletcher was a practical photographer. He had not been in business on his own account within three years of filing his petition. He considered that since 1892 Miss Fletcher was the sole owner of the business, because of the money he owed her. He had been aware of his insolvency since 1889.—The examination was declared closed.

ARTS AND CRAFTS EXHIBITION AT BODMIN.—The Annual Exhibition of the above, in connexion with the Bodmin Section of the Girls' Friendly Society, was held in the Public Rooms, Bodmin, on April 28 and 29, 1896. It consisted of oil and water-colour paintings, carvings, art needlework, and other kinds of decorative work, also a class for photographs. This class was rather weak, but some of the photographs afforded interest. There was only one prize given, which went to Miss Tremain for a set, viz., *Where are you going to, my pretty maid?*, but in this exhibit natural scenery is given, giving good effect; the figures are very small, but well posed. Some lessons were to be learned by the studious in photography in reviewing the oil and water colours, whilst others suggested the thought and wish "never to do likewise." Refreshments and good entertainment served to keep the reviewing from being monotonous, and led many to wish the next annual would come soon.

THE NEW ASTRO-PHOTOGRAPHY.—Mr. D. Packer writes to the *English Mechanic:* "The latest feature in this new research is an important and very surprising one. It has been found that, if a sheet of metal, or even glass, is exposed for a few minutes to the focussed image of the sun, immediately transferred to the dark room, and placed in contact with a photographic plate or paper for several hours, on development an image of the solar corona makes its appearance. To obtain a good result, it is necessary to treat the metallic or glass plate as if it had received a charge of electricity. Nothing metallic should be allowed to come in contact with it, and it should be taken out of its frame by some insulating tool. This new discovery goes far to prove that the nature of the newly discovered radiance is electrical. It also affords a very important confirmation of the direct method of exposure, for it is evident that, if both methods show the same result, the phenomenon must be real, and not due to any leakage of light or a mere effect of contact. M. Niépce long ago discovered this remarkable property in sunlight (*Comptes Rendus*, vols. for 1857-58), many papers), and he even bottled up this 'invisible phosphorescence,' as he calls it, in tubes saturated with a solution of tartaric acid or a salt of uranium, which, after exposure to light, retained their property of affecting photographic paper for months after, thus wonderfully anticipating Professor Salvioni's cryptoscope."

HOTELS IN NORWAY.—Mr. F. A. Bridge writes: "The hotel proprietors of Norway are becoming keenly alive to the advantages of having dark rooms, and at several of the places where Mr. Bridgman and I stayed on the occasion of our last visit we could (had our folding tents not made us independent of it) have had very good accommodation for changing our plates. In some instances, however, these so-called dark rooms were only a delusion and a snare. The hotels, except in the cities, are built almost entirely of wood, and it is never wise to begin changing plates until you have been in the dark room a short time. These cupboards seem all right at first, but after a little while there is no difficulty in seeing the rubbish left behind by the previous occupant, or, for the matter of that, reading a newspaper quite comfortably. Notwithstanding that last season was very short, and not considered a very prosperous one in some parts of Norway, things appear to be flourishing in Bergen, and in their preparations for the forthcoming season the hotel proprietors have not forgotten the amateur photographer. Only a few days ago I received a letter from Mr. Smeby (proprietor of Smeby's well-known hotel), in which he tells me he has also purchased the Hotel Bergen, on the opposite side of the street, and, among the attractions of the new hotel, he mentions a large dining-room, which will hold nearly 100 people, 100 beds, a good smoking-room, a fine garden, 'which I think everybody will like,' and last, though not least, a nice dark room for photographers to use. Intending visitors to Bergen should 'make a note' of these combined advantages."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

May.	Name of Society.	Subject
11	North Middlesex	*Perspective, in Connexion with Photography.* W. E. Debenham.
11	Oxford Camera Club	*Platinotype.* T. H. Stringer.
11	Richmond	Annual General Meeting.
12	Ashton-under-Lyne	Excursion: Bowdon, for Dunham Hall and Park. Leader, S. Sharp.
12	Hackney	*A Cycling Tour with a Camera.* E. T. Coombes.
12	Royal Photographic Society	*Dry Plates for Röntgen-ray Photography.* H. Snowden Ward.—*Notes on the Pyro-developed Image.* Alfred Watkins.—*A New Stripping Film for Negative Work.* J. B. B. Wellington.
13	Croydon Camera Club	Photographic Chat.
13	Photographic Club	Open Night.
13	Putney	Annual General Meeting.
14	London and Provincial	*Photo-mierography.* S. Ashby.
16	Aintree and District	Excursion: Knowsley Hall and Park.
16	Ashton-under-Lyne	Excursion: Hebden Bridge, for Hardcastle Craggs. Leader, Walter Leigh.
16	Birmingham Photo. Society	Excursion: Warwick and Guy's Cliff.
16	Borough Polytechnic	Excursion: Chingford.
16	Croydon Camera Club	Excursion: Half a Day with Mr. A. R. Dresser. Leader, The President.
16	Hackney	Excursion: Enfield Town. Leader, J. J. Westcott.
16	Leytonstone	Excursion: Dorking. Leader, W. J Battell.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

April 30,—Mr. E. H. Bayston in the chair.

Mr. T. E. FRESHWATER exhibited some shadowgraphs of a young pigeon and a dove.

HALATION.

The HON. SECRETARY said that Mr. Wiss had expressed his opinion at a previous meeting that halation was largely due to radiation in the camera, and had since been good enough to get a piece of ruby-coloured glass, coated with emulsion, which he had asked him (the Hon. Secretary) to expose with another plate, coated with the same emulsion, but on ordinary glass. This he had done, but the ruby glass was so intense that it was practically impossible to judge if any effect as suggested had taken place, but he was going to strip the film and make a comparative examination of the two negatives.

Mr. TEAPE, after an examination by gaslight, pronounced his opinion that there was no halation in the negative on the ruby glass.

The SECRETARY, referring to some surprise that had been expressed at his recommending a developer weak in pyro, passed round a negative developed with three-quarters of a grain of pyro per ounce, and which he thought would have been better with less.

Sample sheets of Hedliczka's new Vindobona Rembrandt celloidin paper were distributed, and, in a short discussion on the subject, the Secretary said he had tried some collodio-chloride papers, but did not like them much, as they had a tendency to yield "flat" prints.

Mr. EVANS then gave a display of some of his lantern slides of Lincoln Cathedral. Referring to the idea that he had come there to show them how to overcome halation in work of this kind, he was afraid there was some mistake. His practice was to shirk the impossible, and avoid too difficult subjects. He used films wherever possible, and advised them to do likewise. By these means he said he had got a good many successful accidents together, and thus got the credit of conquering halation. He used pyro ammonia (from half to three-quarters of a grain per ounce), and developed slowly, giving a full exposure. His negatives were all done on whole-plate size, and were the result of eight and a half days' work, all the development being done at Lincoln, as he wished to make sure of his bag before leaving. Pyro ammonia was also used for the slides, and they were very fully developed, if necessary being reduced subsequently. During the exhibition of the slides he gave a running history of the building and the restorations that had been made, distinguishing the Norman from the Early English additions. Every subject, he explained, had its own special hour of lighting, and required careful judgment to dodge the effect of the rays of light from the many windows. To show more plainly the detail in some of the carving and sculptures, he threw on the screen enlarged portions from the same negatives which were much admired, as were the whole series. He was opinion that an unbacked film would work quite as well as a backed plate, unless a very special subject, and he thought that, if films could be backed, they would be almost perfect. Very little backing was necessary at Lincoln, there being a good deal of colour in the windows, but he agreed that there were many places where it was beneficial.

The HON. SECRETARY had found a deal of difference in the colour of the stonework, and instanced a place where it was glaring white and very difficult to render.

Mr. EVANS agreed. He preferred to have a lot of stained glass in a cathedral, as it gave a chance of long exposure, and was infinitely better than colourless windows.

Mr. TEAPE'S experience with films was not great, which probably accounted for his belief that films were not so subject to halation as glass plates. He commended Mr. Evans's habit of avoiding severe tests.

PHOTOGRAPHIC CLUB.

APRIL 29,—Mr. J. E. Hodd in the chair.

Mr. Frank Haes showed one of Stone's piston pumps, which he used as an alternative, and preferably, to a pneumatic ball, for releasing his instantaneous shutter.

Mr. ISENTHAL then read his paper, entitled

A SYNOPSIS OF THE NEW PHOTOGRAPHY,

which he illustrated with a selection of lantern slides, showing the very "up-to-dateat" results obtained by English and other workers. After the paper, the lecturer gave a practical demonstration of the method. He also illustrated the use of the cryptoscope—a fluorescent screen by which the action of the X rays is made visible to the human eye. The apparatus, which was made by Hurst & Co., of 66, Fenchurch-street, consisted of an intensity coil capable of making a six-inch spark, and worked by a six-cell primary battery.

Mr. Horace Wilmer and Mr. Staley having submitted to the operation of having their hands "radio'd," a conversation upon the general aspects of the new discovery followed.

Mr. SNOWDEN WARD, who had just returned from his lecture tour upon the same subject, made a few remarks upon the subject of the irregular action of the radiant matter tubes and their life. He thought that much depended upon the position in which the tubes were placed for working in regard to the magnetic field of the coil, and said that the result of some investigations which he had been engaged upon—and which were, indeed, only partly completed—led him to think that a position in which the longer axis of the tube was parallel to the axis of the induction coil would be found to be most suitable to regular working and the life of the tube as well. Mr. Ward also referred to the fact that some Continental workers had claimed to make good results with an "influence" machine for exciting the tube.

Mr. ISENTHAL was understood to agree with Mr. Ward as to the necessity for placing the tube in such a position as would free it as much as possible from the influence of the magnetic field and lines of force of the coil. In regard to the suggested use of a Wimshurst machine, the climatic conditions

in this country, he stated, were altogether against such instruments, which were notoriously unreliable in action. He stated that, at the Salpetrière Hospital in Paris everything which could be done had been tried to ensure dry insulation, but without a satisfactory result. He, therefore, preferred the more reliable, if more expensive, coil for this purpose. He added, that he believed that, with increased knowledge and improved manufacture, the life of the so-called "focus" tube should be almost indefinitely prolonged.

A very hearty vote of thanks to Mr. Isenthal was passed by acclamation, in which both members and visitors, of whom a large number were present, joined.

On May 27 Mr. Frank Haes will give a demonstration of the Dagnerreotype process.

Putney Photographic Society.—The annual Lantern-slide Competition by members of this Society was held at their new premises, Chelverton Hall, Chelverton-road, Putney, on Wednesday, the 29th ult. Dr. W. J. Sheppard occupied the chair, and Colonel Gale kindly acted as Judge. There were 126 slides, consisting of twenty-one sets, submitted for competition, which proved to be rather a keen one, the Judge having to take great trouble before coming to a final decision. The awards were: Silver medal, Mr. W. F. Gorin; bronze medal, Mr. W. Martin; certificate, Mr. W. J. Colebrook.

Aintree Photographic Society.—May 1.—Three new members were admitted, making a total of fifty-nine. A paper should have been read on stereoscopic photography, written by Mr. Fenton-Jones, Secretary of the Hackney Photographic Society, but had to be postponed in consequence of the large amount of other business. It was decided to hold the third annual Exhibition of Works of Art and Photography towards the end of the present year, when the new and spacious public hall now being built for Mr. W. P. Hartley would be complete, and, instead of limiting the competitions to local societies only, the classes would be open to all. Further particulars will be published shortly, and societies generally are invited to take a note of this.

Bradford Photographic Society.—April 30, Annual Meeting, the President (Mr. Alex. Keighley) in the chair.—The PRESIDENT briefly reviewed the past work of the Society and its growth. At the present time there is a membership roll of 176 members, although the Society is only a little over sixteen months old. It owns a very good lantern and accessories, besides various other small items, although its subscriptions up to this have only been 2*s.* 6*d.* per annum, but a change has come, and the subscription is to be raised to 3*s.* 6*d.* per annum. Let us hope this will be more satisfactory. Still there is an old saying, "More have, more want." The minutes of the previous meeting were read by the HON. SECRETARY and adopted. The financial report for the year ending December 31 was read by the Hon. Secretary, which was very satisfactory, showing a balance in the Society's favour of 4*l.* 11*s.* 4½*d.* This was adopted amidst loud applause. The next business was the reading of a set of new rules, submitted by the retiring Committee. These were read by Mr. RAMSHAW, and to all intents and purposes were all that could be desired, but in all societies there are a few members who think they know best how to govern the affairs of the Society, and, of course, we have got a few of these kind of people amongst us, and the consequences were that nearly the whole of the evening was taken up by a lecture from one of the members upon the working of other societies, instead of getting on with the business for which the meeting had been called. Eventually he dried up, and twenty-three general rules were passed. The next was the reading of a set of competition rules, but, as it was getting late, Mr. LENA proposed that these be postponed until next Thursday. Seconded by Mr. W. MARSHALL, and carried. The next business was the election of officers. The following gentlemen were elected:—Mr. Keighley was re-elected President unanimously. Mr. A. P. Rendell, Mr. Walter Booth, and Mr. F. J. R. Sutcliffe were elected Vice-Presidents. The retiring Secretary was proposed for re-election, but, as it was impossible for him to work in harmony with one of the Vice-Presidents, he would not stand, therefore the election of Secretary and Treasurer was postponed until next Thursday. The following gentlemen were elected on the Committee: Messrs. H. Cousen, George Swain, S. Hill, F. Nicholson, W. C. Ramshaw, Peel Wilkinson, Rev. W. H. Eastlake, Messrs. W. A. Bell, George Thistlethwaite, and P. E. Newstead. A vote of thanks was proposed to the retiring officers by a member who, only a fortnight previous, had proposed that a vote of censure be passed on the Committee for its shortcomings. The proposition was carried. The PRESIDENT briefly acknowledged the vote of thanks. According to the new rules, the night of meeting is to be altered to Monday, which ought to be a decided advantage, because it will allow of several members connected with another society of some importance in the town, and who are good amateur photographers, joining the Society, seeing that the night of meeting does not clash with theirs. It is to be hoped that on Thursday next the members will turn up in full force, as, in all probability, there may be some alteration in the general rules. Already the aforementioned knowing member has given notice that he will propose the rescinding of one of the rules he proposed, and which was passed. Let us hope that they will get over the work a little quicker than at the last meeting; and, if there are any addresses to be given, it would be as well if the members would reserve them for a future night, when the whole of the evening can be utilised.

Liverpool Amateur Photographic Association.—April 30.—Mr. DAVID LEWIS gave a lecture, entitled

500 MILES UP THE NILE, OR FROM CAIRO TO THE FIRST CATARACT.

He illustrated, with the aid of some 120 lantern slides, the interesting objects of interest at Luxor, Karnak, Assouan, and the island of Philal.

Oxford Camera Club.—April 27, Sir W. J. Herschel, Bart. (the President or the Club) in the chair.—A demonstration was given by Messrs. E. A. RYMAN-HALL and E. L. B. HILL, of

RADIOGRAPHY, OR PHOTOGRAPAY BY RÖNTOEN X RAYS.

A number of lantern slides were first shown, illustrating various objects taken by the demonstrators. Besides the radiographs, or electrographs, of animals, such as mice, rats, and a mole, showing the skeletons through the flesh, there was one showing a needle in the hand of a patient at the infirmary, this having been used to find the position of the needle, which, after having rendered the hand useless for nine weeks, was thus successfully extracted. A radiograph was then taken of Miss Herschel's hand, through her glove, and afterwards of that of Mr. G. J. Burch, both being developed before the end of the meeting with perfect success by Mr. Ryman-Hall. An interesting point was brought to light by Mr. Hill, who pointed out that we have in this process an infallible test for diamonds, the real article being quite transparent to the rays, while "paste" is very opaque. While the development was proceeding, experiments were shown with a phosphorescent screen, prepared with barium platino-cyanide. This was quite opaque to ordinary light, and the Crookes' tube was also enclosed in a cardboard box, so that it was quite invisible; but, on placing the hand between this box and the screen, the bones of the hand and even of the arm could be perfectly well seen in outline. Towards the end of the evening a half-sovereign was thus rendered visible through two fairly thick books. The electric current for working the Crookes' tube was supplied from accumulators kindly lent by the Electric Light Company.

Rotherham Photographic Society.—April 28, Mr. J. Leadbeater (Vice-President) in the chair.—The American interchange slides were shown. Excursions to Piskhill and Blyth, Bolsover Castle, and Millers' Dale were arranged. It was reported that the balance-sheet of the recent Exhibition showed a profit of over 5*l.* Regarding the members' competitions the entries were slight. Mr. C. B. Keene, F.R.P.S., Derby, had acted as Judge, and his awards were as under:—Four prints (any process): 1, R. Chrimes; 2, Miss Crossley. Four silver prints: 1, Miss Crossley; 2, A. S. Lyth. Lantern slides: 1, R. Chrimes; 2, A. S. Lyth. Enlargement: 1, G. T. M. Rackstraw; 2, A. S. Lyth.

Stereoscopic Club.—April 27, four new members elected.—Mr. W. I. CHADWICK (the Hon. Secretary) exhibited a number of prints from negatives he had made by the X rays, many of them being interesting physiological subjects, which had been prepared previously to surgical operations. Mr. Chadwick said the apparatus necessary for the production of these X rays impressions was a powerful induction coil, with a suitable electro-motive force, a highly exhausted (vacuum) tube, and a photographic dry plate. The electro-motive force might be obtained from batteries or from a dynamo, or, in some cases from the street main. Bichromate batteries had the advantage of inexpensiveness; Grove's batteries were decidedly more steady and uniform in action, but the noxious fumes given off by them rendered them unsuitable for the library, study, or consulting-room, and storage batteries (accumulators) were much to be preferred; they were steady and constant in the discharge; clean, without smell; exceedingly portable, and would maintain their full efficiency for thirty or forty hours' solid work (either continuously or at intervals spread over a considerable period), and could be recharged at a cost of from 1*s.* 6*d.* to 2*s.* each. The induction coil used was one giving a four-inch spark in air, and provided with a suitably large condenser. This latter is a most important provision; and, in connexion with induction coils, Mr. Chadwick said that twenty years ago hundreds of scientific amateurs had a mania for constructing a large induction coil, and confessed that he himself was at about that time so affected; but the limited use to which powerful coils could be applied in those days soon caused them to be put aside as things of the past; but, since the publication of Professor Röntgen's discovery—we might say within the last three months—most of these old coils have been brought to daylight again, either to be pressed into service or to be disposed of at extraordinary high prices. It should be said, however, that many of the coils constructed in those days, even when supplied by professional electrical-instrument makers and dealers, are inferior to the modern instruments. The efficiency of a coil is not to be judged by its weight or its bulk. The vacuum tube of whatever form should be highly exhausted, and, to give a comprehensive notion of what high exhaustion means, Professor Crookes stated that the highest measured exhaustion 0·02 M* bears the same proportion to the ordinary pressure of the atmosphere that a millimetre does to thirty miles, or, in point of time, that one second bears to one year and eight months. Thus it will be seen that the making of these tubes is a tedious and a slow process, and, with a demand at present far exceeding the supply, the natural result follows that a large number of low vacuum tubes are placed upon the market, and these, for successful work, are practically worthless. The greatest care is to be exercised in the use of the tubes. The negative terminal of the coil should be connected to the cathode of the tube, and the positive connexion from the coil to the anode of the tube. If this point be neglected, the tube may be permanently injured. Sometimes it is an advantage to slightly warm the tube by a spirit lamp, and this may be done during use, but on no account touch the tube by the hand during use. A tube, after working for an hour or two, will sometimes refuse to work longer, as though it were fatigued; it should then be put away in a box, packed in cotton-wool, and, after a rest of a few hours, it will, in all probability, perform as well as ever. Respecting the best photographic plates to use, it does not necessarily follow that the most sensitive plates to daylight are the most sensitive to X rays, and this fact opened out a wide field for investigation, which he was diligently pursuing; many suggestions had been made during the last few weeks, and many statements had been made on the results obtained in exceedingly brief exposures, but most of these statements "broke down" on investigation. To say that practical results had been obtained in a second or two, or that the wrist bones had impressed the photographic plate, or that a developable image of the wrist bones had been produced in one minute, was untrue. Phosphorescent and fluorescent screens had, within the last few weeks, received much consideration and attention, and with some improvement, it should be said, but the best that had been done so far was very much inferior in definition—sharpness of outline—to the impression secured by the photographic plate. He had himself produced a fluoroscope by which it was

* M means one millionth of an atmosphere, so that 0·02 M means two hundredth part of one millionth of an atmosphere, an atmosphere = fifteen pounds per square inch = thirty inches of a column of mercury, or 760 millimetres.

quite easy to see the coins in a leather purse, placed behind a Slater's dictionary (a book four inches thick), but by the same appliances used under very similar conditions, he could not find a needle imbedded in the wrist of a patient, whilst photography quite easily revealed the lost needle. The interest manifested by the members drew from Mr. Chadwick a promise to give an illustrated lecture on the subject, with practical demonstrations, at an early date, and it was decided that members be entitled to invite friends, including ladies.

Patent News.

THE following applications for Patents were made between April 22 and April 29, 1896:—

PRINTING SURFACES.—No. 8390. "Producing Printing Surfaces by the aid of Photography." C. L. A. BRASSEUR and S. P. SAMPOLO.

PHOTOGRAPHY.—No. 8394. "Improvements in and connected with Photography." J. M. DAVIDSON.

SHUTTERS.—No. 8405. "Improvements in Shutters, Sheaths, Slides, and the like, applicable to Photographic Purposes." M. M. DESSAU.

KINETOSCOPE.—No. 8418. "Improvements in connexion with the Projection of Photographs of Animated Subjects." J. BONN.

COLOUR PHOTOGRAPHS.—No. 8663. "Improvements in Apparatus for Producing and Viewing Colour Photographs." W. WHITE.

POCKET APPARATUS.—No. 8790. "Improvements in Pocket Photographic Apparatus." COUNT T. D'OKSZA and G. BOURRELLY.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

DEVELOPERS AND THE SPEED OF PLATES.

To the EDITORS.

GENTLEMEN,—My attention has been called to a remark passed in one of your editorials with regard to a statement made by me at the Photographic Club: You say that Messrs. Hurter & Driffield's statement that *all* developers give the same speed is incorrect; to be quite strict, Messrs. Hurter & Driffield have not said this. In their original paper, they say it may be possible that some developer might be found which would give a speed different to the developers they tried at the time they wrote their paper. There has been so much misunderstanding, and so much antipathy to the views of Messrs. Hurter & Driffield, that it is necessary to offer some little explanation.

Some plates seem to show very little difference in speed readings with various developers; others, again, show enormous differences. What I implied in the discussion at the Club was, that considerable differences in speed could be obtained by varying the constituents of the same developer, but the reporter went a step further than this, and seemed to imply that Messrs. Hurter & Driffield claimed one speed for every developer; this, of course, they did not do, and I hope in justice to them that you will insert this explanation. It is a point now well acknowledged by all, and also by Messrs. Hurter & Driffield themselves, that different speeds can be obtained by varying the constituents of the same developer, but it does not follow that this admitted fact is universally true for all kinds of plates. I myself, with a view of trying to confirm or disprove Messrs. Hurter & Driffield's experiments, tried some experiments with some extremely slow plates of a particular make, and the result was that the speeds obtained by a great variety of developers were practically the same. I have even had the extraordinary result of one plate being practically three times quicker to ferrous-oxalate developer than to the pyro-ammonia developer I was using at the time; another plate, on the other hand, proved three times quicker to the pyro-ammonia than to ferrous-oxalate, thus entirely reversing the order of things. Considering the intricacies of photographic chemistry, I think that it would show a little better feeling if less hostility were shown to Messrs. Hurter & Driffield, and people more appreciated the valuable work which they have done. After nearly four years' constant practice of their system of speed determination, I am quite unable to find fault with the method; it is only a matter of practical detail as regards suitable standards for their system to be proved perfect in its practical application. They were the first to show the relation of density to speed, and as such deserve credit for this important work.—I am, yours, &c.,

Ashtead, Surrey, April 28, 1896. JAMES CADETT.

THE DALLMEYER-BERGHEIM LENS.

To the EDITORS.

GENTLEMEN,—In the discussion which followed the reading of Mr. Sutcliffe's paper at the Camera Club last Tuesday week night, mention was made of the Bergheim-Dallmeyer lens with respect to its great success in artistic portraiture, but there seemed to be a very prevalent opinion that its merits artistically were seriously discounted by its demerits practically, that it required too long an exposure. The impression seemed to be that one minute and a half at least was the necessary time.

In justice to the instrument, may I be allowed to say that I have seen it in work, and excellent portraits taken by it in from four to ten seconds, and I rather think that by now there is to be seen at the Camera Club a portrait, and as fine a one as could be well wished for, which was taken in eight seconds.—I am, yours, &c., ALICK COOPER.

Crichhton Club, 39, King-street, Covent Garden, W.C.

ASSISTANTS AND THEIR GRIEVANCES.

To the EDITORS.

GENTLEMEN,—I think a "Retoucher of Thirty Years' Standing" voices the general opinion amongst assistants when he says "that the time has arrived when something should be done." He also strongly recommends the formation of a Union. To form a Union would be an easy matter if only the necessary funds and members were forthcoming. At least 20*l.* would be required for printing, advertising, books, &c., to start a sound Union; and a hundred members would be sufficient to ensure its success. Given the funds and the members, it would need some energetic individual to work very hard for some weeks to organize, advise and correspond with members. Very few in the trade are in a position to give the time and money, or to devote their energies to making such a Union a sound and going concern. Once fairly started, however, it would be bound to succeed.

Failing a photographic Assistants' Union, there remains the alternative of joining some kindred society. I have lately been in communication with the leaders of several trade unions, and their opinion is that it is better to join some existing union rather than attempt a fresh venture. In short, they uphold a policy of "fewer unions and more union."

The "Shop Assistants' Union" is the best adapted to the needs of photographic assistants, and I am told that it already numbers some photographers amongst its active members. Its main objects are as follows:—

To reduce the hours of labour.
To secure fair payment for services rendered.
To regulate the relations between employed and employer.
To assist members when ill or unemployed.
To assist members to obtain a situation.

Now all these are precisely the objects for which a "Photographic Union" would strive. The subscription ranges from 2*d.* per week upwards, with special terms for ladies. The General Secretary, Mr. Jas. Macpherson, 55 and 56, Chancery-lane, London, will give all information, and give assistance to form new branches.

With respect to stating "who are the wrong doers," I may add that this can only be done effectually by trade-union methods, *i.e.*, by members making complaints at their branches, and the Secretary warning all members against the offenders.—I am, yours, &c.,

18, *Canbury Park-road, Kingston-on-Thames.* JOHN A. RANDALL.

AN AMUSING REPLY.

To the EDITORS.

GENTLEMEN,—I am in receipt of a letter from Mr. Richardson Brown which entirely relieves me of the paternity of the developer which has caused this little flutter.

Whether there has been a misprint, or whether the developer was put forth *bonâ fide*, I do not know; but, judging from a print which Mr. Brown sends (and to this extent Mr. Brown has a pull over his critics), there is no doubt that good average results are to be had by means of its use; I say average results advisedly, for, after all, they are no better than can be got by the use of formulæ which are more in the beaten track, and which, if not brilliant or eccentric, are eminently useful and satisfactory.

I really think I am the only photographer who has not invented a developer, and the thing seems easy enough too; but, from the chemist's point of view, when some of these formulæ are brought in, it is difficult to tell sometimes whether one is "making up" a spring medicine, a German mineral water, a weed-destroyer, or even an artificial manure!—I am yours, &c., J. PIKE.

Nottingham.

MONS. JARCHY'S BABY SHOW.

To the EDITORS.

SIR,—In reply to the remarques appeared in the last week Number, I beg to state that if the whorty correspondent who complain of not carrying out my scheme of a Baby Show will be manly enough to sign his real name and adress in the capacity of a speaking volce of several complaining about me, I will be only too glad to satisfy him *in extenso*.

"Poltrons" only hyde their name, and to those I never reply.—I remain, Dear Sir, yonrs respectfully, A. L. JARCHY.

45, *Union-road, Rotherhithe, London, May* 4, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

BRIGHT STOPS.—STOPS. Thoroughly clean the metal, and then, after making them hot, plunge them in a weak solution of bichloride of platinum and wash.

DISCOLOURED PYRO SOLUTION.—BEGINNER. If the solution were made up as directed, and it works satisfactorily, the slight discolouration may be disregarded. Certainly the straw-colour tint of the solution will have no effect on the permanence of the negative.

SPECIMENS.—OPERATOR. We should not advise you to send specimens of your work to the party named. We have had complaints, more than once, from those who have done so, of their not being returned, or anything heard from the people, even after repeated inquiries.

CARBON TISSUE.—JOSEPH HYMAN asks what are the colours used in making carbon tissue?—They are numerous; indeed, any pigment may be used, provided it is unaffected by the bichromate, and that it itself has no action on the gelatine or other constituents of the tissue.

REGISTERED TITLE.—R. A. BLACK says: "I should esteem it a favour if you would kindly let me know if the word 'Photo-chromo' is a registered title for coloured photographs."—In reply: We cannot say whether the name is registered; in all probability, not, as it is a very common one.

GELATINE FOR MOUNTING.—C. ROGERSON. The trouble has been due to employing an unsuitable gelatine. Coignet's gold medal is a gelatine that sets very quickly, and you require one of an opposite character. Try Nelson's "No. 2 Soluble," or a soup gelatine. Either will get over the difficulty.

PHOTOGRAPHING IN EPPING FOREST.—B, PUNFORD writes: "Will you kindly inform me if permission is required to take views in Epping Forest? If so, where can it be obtained?"—In reply: Permission is required, and may be obtained of the Town Clerk to the Corporation of the City of London, Guildhall, E.C.

COLOURING ALBUMEN PRINTS.—CLARA. A very common way to make albumen prints "take" water colours is to lick the surface over with the tongue. Another plan is to wash them over with ox gall, as sold by the artist's colourmen, highly diluted with water. A camel's-hair pencil, charged with water and touched with the gall, is sufficient.

FOREIGN WORK ON PHOTOGRAPHY.—MAX SEIGEL. We are not at all surprised that you have failed to obtain the work in England, as foreign works, unless they are translated into English, would have no sale here. However, any foreign bookseller will obtain it for you. Better still, perhaps, ask one of your German friends to get it in Berlin, and post it on to you.

BLOOD ALBUMEN.—A. Z. (Surbiton) inquires who are the manufacturers of blood albumen, as he wants a few pounds for experiments?—There are numerous makers of it, but it is very doubtful if any of them will supply it in small quantities. It may be had from Skilbeck Brothers, Upper Thames-street, E.C., but whether in such small quantities as our correspondent requires we do not know.

ALBUMEN PAPER.—C. TURNER. We have never heard of that brand of paper here. If you require it, you will have to get it direct from America. Probably it is the same as one or other of the papers supplied here—made in Germany—under another name. A few, very few, German houses supply albumenised paper, which is vended in various parts of the world under scores of different names.

PUBLICATION PHOTOGRAPHS; ADDRESS.—F. D. We have no recollection of such an advertisement; but the best way is to submit a copy of the photograph to the papers, and state your fee if they reproduce it. If you join the Photographic Copyright Union, it will give you all the information on the business side of the question. The firm named ceased to exist between twenty and thirty years ago.

WET COLLODION.—REPRODUCER. Some operators, we know, prefer the common copperas of the oil shops to the protosulphate of iron of the chemist for their developing solution. The reason given is that the former is, generally, more or less oxidised, and is found to give cleaner and denser negatives. On the other hand, unless it is made stronger, it is not so energetic a developer as the protosulphate.

PASSPORTS.—R. WADE. Passports are not necessary for Holland, Belgium, or Germany; but it will be well to be provided with one. It is little or no trouble to obtain, and its cost is but nominal. It is rarely useful, but, when it is, is of great value. An English passport should always be in the possession of an English photographer if he is going to photograph on any of the frontiers, especially the Franco-German ones.

SAVING RESIDUES.—T. ROMER writes: "I am an amateur and use a hand camera, and consume two or three gross of plates a year of the usual quarter size, and, beyond taking a proof print or so, put my printing out. Do you think it would ease the cost of photography to me, a not over-well-off amateur, to save the residues?"—No; it would certainly not be worth while, even if silver were double the price it is.

PHOTOGRAPHIC MATERIAL.—T. S. HARGREAVES. Messrs. Marion & Co., or any of the large dealers, will supply what you require. We cannot give you the addresses of the actual manufacturers, and, if we could, we doubt very much if they would supply you direct. The manufacturers of this class of goods only supply dealers on a large scale, and not consumers, who, perhaps, only require a gross or two of any one size occasionally.

LENS FOR COPYING.—PROCESS asks: "Which is the best lens for copying, the rapid rectilinear or the old triplet? I have heard some who use them say that the triplet is the better of the two."—The triplet is an excellent lens for the purpose, and so is the other. Some prefer one and some the other. Each has its advantages. In actual practice, as we learn from those who use both forms, there seems to be not much to choose between them.

COPYING DAGUERREOTYPES.—S. & Co. There is no difficulty in copying Daguerreotypes if care be paid to the illumination of them at the time. Arrange the light so that the buffing or polishing of the plate does not show on the focussing screen. Also see there are no reflections in the studio that fall on the plate. It is a good plan to cover up the front of the camera with the focussing cloth to avoid reflections from the camera and its fittings.

STAINED NEGATIVE.—FRED. JONES writes: "I unfortunately left a plate in the hypo all night, which has turned the plate a reddish colour. I shall be pleased to know if there is a remedy for same."—If the hypo was freshly made, we should not expect any discolouration that would materially interfere with the printing quality of the negative. If the stain is great, try the effect of a clearing bath of alum and hydrochloric acid, or alum and citric acid.

X RAYS.—S. E. WRIGHT. A coil that will give a six-inch spark, with three cells of Grove's battery, will do quite well for experimenting with the Röntgen rays, and such an instrument would be *very* cheap for 2*l.*; but, before purchasing it, see that it will do what is claimed for it. When new, it might have done so, but the case may be different now. The price makes us a little doubtful. Nothing is more risky than buying a second-hand induction coil without trial.

ADDRESS WANTED.—C. WEAVER says: "I recently bought, with other goods, a portrait lens bearing the name of Bourquin & Co. The balsam of the front lens seems to have gone wrong. Can you tell me the address of the firm, that I may send it to them to be set right?"—The address used to be either in Berners-street or Newman-street, if we remember rightly; but the house must have ceased to exist nearly, or quite, thirty years ago. The lens will be of French make, however.

WATER SUPPLY.—BARREL says: "Some time ago I attached a small barrel to hold water to the one side of my dark room; the water brought in with an indiarubber tube and tap. The barrel was tarred to stop leakage. Now, I find, when the water is drawn off, it smells so bad that it cannot be used. Will you kindly tell me what I can do to clear it? Is it owing to the top of the barrel not being open, or the tar outside going through?"—The only remedy is to frequently change the water and not let it stay long in the barrel.

BACKING ENAMELLED PRINTS.—ENAMEL asks: "Would you kindly inform me what sort of paper would be suitable and chemically pure for stiffening enamelled prints? I am at present using ordinary drawing paper (white), but I fear the result on the prints. Is there a paper sold for the purpose? I use a great deal, enamelling nearly all the prints sent out."—The purest paper would be that specially prepared for photographic purposes, namely, that known as the "Saxe," of Steinbach, or the Rives' paper. Either of these may be relied upon.

TONING DIFFICULTY.—W. K. S. writes: "Will you kindly inform me where I am at fault in toning my prints? I use Ilford (pink) P.O.P., and a fresh bath each time made the day I require it (sulphocyanide ammonium, 30 grains; gold, 2 grains; water, 16 ounces). They generally tone all right, but after washing in running water and before fixing they turn to a nasty greenish colour and remain so."—Unfortunately we cannot say, except that it is something in the manipulation. If the prints were treated in the usual manner, they would not behave in the way stated. Of course, without seeing the manipulations carried out, we cannot say how our correspondent has got wrong.

RESTORING DAGUERREOTYPE.—R. W. writes: "One of my customers is going to bring me a Daguerreotype, which he highly values, to restore and copy. I know that they can be restored; will you please tell me how?"—The picture can be cleaned by treatment with cyanide of potassium; but, if, as we imagine from the query, our correspondent is not familiar with the work, he had better entrust it to the hands of one who is, and not attempt it himself. The restoration of a Daguerreotype is a very simple matter with those who are familiar with the process, but many highly prized portraits have been utterly ruined by those who are not. The method of cleaning has been dealt with over and over again in these pages.

SPOTTY PRINTS.—T. W. R. writes: "Enclosed please find four cabinet prints, which, you see, are covered with spots, although they have only been done from three to four months. The one marked with a X was only printed a month ago, and yet it is covered with spots. They are very small, as you see, but they seem to get bigger with time. I need scarcely tell you that there were no spots upon them when they were sent out. I am now having prints brought back almost daily on account of spots, and it is threatening to do my business a serious injury. My printer says, and as I have kept a careful eye upon him I believe him, he takes every care in the fixing and washing. What can be the cause?"—In our opinion the cause is not far to seek. It is the bronze powder with which the name, &c., is printed. If the mounts be carefully examined, it will be found that they are studded all over, back and front, with the bronze, hence the spots. Avoid bronze printed mounts in future.

THE BRITISH

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EX CATHEDRÂ.

The success of the Leeds meeting of the Photographic Convention of the United Kingdom seems assured, and we should not be surprised if, in point of interest and numbers, the gathering surpassed its predecessors. Two months intervene between now and the opening day, and no more fitting opportunity, therefore, could present itself for the consideration of matters affecting the Convention meeting of 1897—that is, next year. With regard to that meeting, the Council are without any invitations, and there exists some doubt as to where it is to be held. This is a point upon which it is desirable that some discussion should take place.

* * *

Belfast has already been suggested as a centre, and we believe the local photographic Society, presided over by that firm and enthusiastic conventioner, Mr. Alex. Tate, would welcome the gathering; but it is pointed out, as a possible objection, that Belfast, for the majority of the visitors, would be found an inconveniently long way off; moreover, it is urged that Ireland was visited so recently as two years ago, and that the time for a second visit has not yet come round.

Geographically speaking, Norwich seems marked out for the meeting; it is the centre of a district rich in features of archæological, historical, and scenic interest, and could supply a diversity of other attractions. The East Coast, so far, has not been visited by the Convention. Everything, therefore, favours Norwich, except the unfortunate circumstance that there is no photographic society there to take in hand the work of organization incidental to the visit of the Convention.

* * *

This last objection also holds good with reference to Southsea and the Isle of Wight, which have been suggested as meeting places; Manchester and Liverpool, however, have not yet been visited, and are centres of photographic activity, with large and flourishing societies. Oxford, Bristol, Exeter, have also been pointed at as supplying suitable meeting places, so that a wide choice is before the Convention.

* * *

Should the Council fail to receive an invitation for 1897 from a photographic society having its home in a suitable meeting place, the obvious plan will be to revert to the course of procedure adopted in the early days of the Convention's existence, and itself select a town to be visited. After all, it is probably not vital to the success of the meeting that a formal invitation from a local society should be received. The meeting place having been decided upon, we are confident that a small committee of resident photographers could easily be formed to take in hand the preliminary arrangements, and, with the experience of ten years to draw from, there would probably be no difficulty in getting up a suitable programme, and successfully carrying it out, without the assistance of a photographic society. We suggest these points for consideration between now and the time when a decision must be arrived at as to the Convention meeting of 1897.

* * *

Mr. John Nicol has undertaken the editorship of our contemporary, the *American Amateur Photographer*. The name of Mr. Nicol will be familiar to our older readers as a frequent contributor to these columns some years ago. More recently he edited the Chicago *Photo-Beacon*, in which his admirable articles and pointed comments were conspicuously welcome features.

The members of the Royal Photographic Society would appear to be taking more interest than hitherto in the selection of Judges for the forthcoming Exhibition, the nomination paper just issued containing the names of a greater number of suggested Judges, we believe, than the papers issued during the last few years. It may be interesting to give the names of those nominated to adjudicate in the Art and Technical Sections:—*Art Section:* Thomas Bedding; J. S. Bergheim; F. P. Cembrano; W. L. Colls; W. E. Debenham; W. Downey; W. England; Colonel Gale; J. A. Hodges; B. W. Leader, A.R.A.; Colonel Noverre; Andrew Pringle; G. A. Storey, A.R.A.; J. B. B. Wellington; B. Gay Wilkinson; W. L. Wyllie, A.R.A. *Technical Section:* Captain W. de W. Abney, C.B., D.C.L., F.R.S.; T. Bolas, F.I.C., F.C.S.; A. Cowan; Chapman Jones, F.I.C., F.C.S.; Andrew Pringle, F.R.M.S.; J. W. Swan, M.A., F.R.S.; E. J. Wall; Leon Warnerke; Paul L. Waterlow; Horace Wilmer; Sir Henry Trueman Wood.

* * *

It will be observed that three artists—Associates of the Royal Academy—were nominated. The inclusion of an artist among the Judges is, we think, a risky thing, for this course is rarely attended by wholly satisfactory results. With an artist present, the awards are apt to create considerable mystification in the photographic mind, as was the case last year and the year before, when certain photographs of an obviously poor quality were selected for the distinction of a medal. The names of the gentlemen selected by the members of the Society to act as Judges will be found on page 317.

PHOTOGRAPHIC ASSISTANTS AND THEIR GRIEVANCES.

Our correspondence columns have ever been open in the interests of photographic operatives, and the letters that have appeared during the last few weeks disclose a deplorable state of affairs as existing in some photographic establishments, unless, indeed, the cases are considerably overdrawn. It must not, however, even for a moment, be assumed that assistants are, as a rule, harshly dealt with in large establishments, for we know as a fact that, in the majority of them, they are treated with the greatest consideration and kindness, particularly the females. The letters we have received refer, we are pleased to say, to only an insignificant number of firms that are said to do large businesses in the cheapest kind of portraiture. According to some letters, it seems that not only are the *employés* compelled to work long hours in confined and ill-ventilated rooms for little wages, but they are subjected to great degradation in the shape of "bullying," &c., by the principals, on the slightest pretext.

This is a state of things that should not be allowed to exist: but where is the remedy? That is a question more easily asked than answered. But, if the facts be as stated, that the girls have to work long hours in crowded and badly ventilated rooms, the Factory and Workshops Acts will give an immediate remedy for that. Indeed, if the thing exists as said, it shows great negligence on the part of the factory inspectors for the districts in which the establishments are situated. If formal complaint be made to those officials, they will have to see that the Act is complied with. It is said that the *employés* are afraid to complain for fear of the after-consequences to themselves; but any one, even if not employed in the place, can put the law in motion. A letter, which will be treated as confidential, directed to the office of the Factory Inspectors, London, S.W., is all that is necessary. We believe that even anonymous communications receive attention, if there is reason to surmise that the writers have withheld their names through fear or intimidation.

With regard to the operators, and those who do not come within the scope of the Factory Acts, a remedy for their grievances is not easy to suggest, because the photographic labour market is so much over-stocked, except perhaps with the highest class of workers. As an instance, quoting from one of the letters, the writer says: "They (the assistants) are content to put up with any form of treatment, for they know there are more recruits on the firm to snap up their places if they should kick." The letter also refers to the salary of twenty and twenty-five shillings a week being paid for operators. Now, this at once proves, in a very practical way, that the labour market is much over-stocked, or such a condition of things would not obtain. While it does, we fear there is no efficient way of altering it.

At the present time there is really very little to learn in photography, as compared with the wet-collodion days, to qualify any one for an appointment in a third or fourth-rate studio, and that is the root of the evil; in any profession or calling where there is but little learning required the supply of labour is sure to be in excess of the demand. As a remedy for assistants' wrongs, it is now suggested that an Assistants' Union be formed. A Trade Union of photographers, to regulate wages, hours of work, and other trade matters, has frequently been suggested; and attempts have, more than once, been made to form one, but they have ended in failure, chiefly owing to the apathy of the assistants themselves. Judging from past experience, there is not a very promising prospect of one being formed at present, unless the assistants show more enthusiasm in the matter than they have hitherto done.

One has only to look back at the Photographers' Benevolent Association, now practically extinct, for confirmation of our remarks. This Association was established some years ago to relieve photographers in distress, and to find them engagements when out of employment, and other benefits. Although the subscription was but half-a-crown a year, scarcely any assistants were members, and, when the Association was on the point of being wound up, a meeting of assistants was called, to make an effort to keep it going, and extend its usefulness. We think we are correct in saying that less than half a dozen attended the meeting, and an invitation to a second meeting met with no better result. With these facts before us, the prospect of forming a Trade Union is not very encouraging, and it is much to be regretted that there is so little general agreement amongst photographic assistants.

As we have remarked on former occasions when dealing with this subject, photography is unlike any of the mechanical trades; the rate of pay can never be regulated by a Union, as it will always be regulated by the individual artistic and photographic ability of the worker. Some operators, so one of the letters states, are paid a pound, or five-and-twenty shillings a week, and possibly that may be as much as they are worth, while others command a salary of two or three hundred a year. There is, however, no reason why a Union amongst assistants should not be formed, if not alone, in connexion with another already in existence, as suggested in a letter last week, and we heartily wish it every success. If formed, it would, if not put a

stop to, at least act as a check upon such "sweating" systems as those detailed in the recent correspondence.

As we have said before, it is only in an exceedingly few photographic houses that the assistants are so inconsiderately treated as they are in those alluded to by our correspondents.

A Monument of Astronomical Photography.—Some conception of the magnitude of the astronomers' work done at the Cape Observatory will be obtained by a perusal of the address of Dr. Gill, H.M. Astronomer at the Cape, at the last ordinary meeting of the British Astronomical Association. He referred to the starting, a good many years ago, with the aid of the Royal Society, to photograph a certain part of the heavens—from declination 18°S. to the South Pole. Every star up to 9·3 magnitude he believed was included in his finished work. The result was a catalogue of about 480,000 stars. This would be published in three volumes of about 800 pages each. The first volume was already completed, the second was in the press, and the third was to be ready for the printers before the first was out of the press, so that in about two years the printed work would be in the hands of astronomers.

Photographic Plates as Coronal Light Recorders.—At the same meeting, various plans were suggested for utilising photographic dry plates to measure the actual luminosity of the coronal light. One member suggested that a print be obtained by contact (on a dry plate) from a sort of sensitometer scale; it would be easy, he said, to take a number of printing frames and expose them to the coronal light, which he anticipated would be quite easy, seeing that, in experiments he had made with a thin negative by the light of the moon, he had found forty-five seconds sufficient exposure. They would have to be exposed, he would consider, at the bottom of a box to keep off light from the horizon. Seeing, however, that Messrs. Hurter & Driffield's system gives an exact measure of the relative value of light and density of the developed plate, it would seem a simpler plan to estimate the light power by that system applied to unprotected plates exposed to the corona at the bottom of a box.

Portrait Lenses *versus* Reflecting Telescopes for Astronomical Work.—Mr. Isaac Roberts, F.R.S., whose magnificent photographic results with the nebulæ are well known, has been making a series of exact experiments to ascertain the relative value of these two types of image recorders, and his verdict is dead against the photographic lens. He used a Dallmeyer 3½ in. aperture and 9·56 focus, and a 5 in. Taylor patent lens of 19·22 focus, and his own large reflector telescope, all under simultaneous and similar conditions of light and exposure, and similar plates and similar developers. His reflector gave, in one region, 3·52 times more stars than the Taylor lens, and 7·78 than the Dallmeyer; and, in another, the increased results from the reflector were about double this. Dr. Gill, however, thought the mode of comparison quite unfair to the photographic instruments, and believed that, for the results to be accepted, instruments of equal light-gathering power, *i.e.*, diameter, should have been used.

The New Astro-Photography.—We have on previous occasions referred to the remarkable results announced by Mr. D. Packer in photographing the solar corona in full daylight through opaque screens, and last week a letter from him appears in the *English Mechanic*, dealing with the same topic. He says: "The latest feature in this new research is an important and very surprising one. It has been found that if a sheet of metal, or even glass, is exposed for a few seconds to the focussed image of the sun, immediately transferred to the dark room, and placed in contact with a photographic plate or paper for several hours, on development, an image of the solar corona makes its appearance. To obtain a good result, it is necessary to treat the metallic or glass plate as if it had received a charge of electricity."

A New Method of Using the Röntgen Rays.—In a recently delivered paper to the Paris Academy of Sciences, M. M. L. Benoist and D. Hurmuzescu have made a series of experiments from which they draw certain general conclusions as to the mode of action of, and how to work with, the Röntgen rays: "The results which we have just stated seem to us to indicate in what direction future researches must be conducted in order to obtain preparations more sensitive to the X rays in photography than plates of silver gelatino-bromide. The salts of platinum, being more absorbent, will, doubtless, be more advantageous, which we propose to verify." It would thus appear to be worth while trying what the effect of the Röntgen rays would be upon platinotype paper. It is true that this paper is many hundred times less sensitive to ordinary light than a bromide plate; yet, if these experimenters' conclusions be verified, it is quite possible that a practicable mode of working might be the result of the trial.

Diffraction of Röntgen Rays.—MM. L. Calmette & G. J. Huillier have submitted to the Academy some photographs obtained by passing the rays through through a slit in a metal screen, placed so that the rays could pass through it and on to a second metal screen, in which is pierced a slit with a thin metallic rod across it. After a description of their mode of working, and of the results they obtain by it, they sum up by saying: "If we compare these results with those obtained by light in the same conditions, the slit being relatively wide and the intensity weak, it seems difficult not to ascribe them to diffraction." The negatives, however, are not sufficiently sharp to enable them to determine the wave-length with precision.

JOTTINGS.

EIGHT hundred and eighty millimetres of liquor ammoniæ, apparently recommended by Mr. T. O. Mawson on page 294, as a constituent of the bichromate sensitising bath for carbon tissue, implies, on the face of it, that the volatile liquid referred to is sometimes quantitatively gauged by French linear measure, a thing which, to quote the Euclidian phrase, is absurd. Second thoughts induce me to suppose that Mr. Mawson intended to mix up ounces with cubic centimetres, but wrote millimetres instead. Still, thirty ounces of strong ammonia would obviously be too large a quantity for the bath referred to, so that the probabilities are that a smaller proportion of liquor ammoniæ ·880 was meant to be given, and that a typographical error is responsible for the confusion. Perhaps Mr. Mawson will kindly oblige with the necessary correction.

Little things, they say, amuse little minds. But for this merciful dispensation, some people would find life impossible to live. Among such I, of course, will not class Mr. S. Herbert Fry, who, under the *nom-de-guerre* of "Major Kone," relieves the monotony of his photographic enlarging labours by the monthly contribution to a contemporary of a number of paragraphs which, if they are not consistently characterised by good taste and accuracy, rightly demand every indulgence in the way of criticism, by reason of the author's obvious ignorance of the nice art of differentiating, for publication purposes, between backstairs tittle-tattle and matters of legitimate public interest and comment.

Mr. Fry, however, atones for these inevitable deficiencies by the generosity with which he places his peculiar knowledge of photographic matters at the disposal of the all-too-limited public to whom he appeals. In contradistinction to the class of individual pointed at in the first line of the preceding paragraph, there are numbers of people who do not, or cannot, allow their minds to dwell on trifles. The Editor of this journal is evidently one, and he is therefore politely chided by Mr. Fry for being "ignorant" and "slipshod." The gravity of his offence is fully proportionate to the sweetness of the language adopted by Mr. Fry, for—will it be believed?—he was actually unaware that gelatino-chloride papers, in the many sizes to which they are cut, included the size 5½×4! Mr. Fry must be surprised at his own moderation.

There are some persons who might accuse Mr. Fry of giving way to that small weakness, so common among journalistic novices, of Editor-baiting, and he shows great courage in risking the accusation. But his long and intimate association with all connected with this JOURNAL clearly prove that he is not animated by any such juvenile motive. There are reasons, known to Mr. Fry, which would force any one familiar with them to be satisfied that his only object was to add to the sum of our photographic knowledge, otherwise he would scarcely expose himself to certain obvious retorts which a malevolently inclined individual might be disposed to fling at him in reply to his implied boast of knowing so much about the photographic trade and photographic paper-making. And then that unfortunate term "slipshod"—to how many things besides photographic editing (such as photographic trading), can it be applied, and with far more point and effect!

The financial position of the Camera Club Company is said to be, just now, not of the healthiest, and I suppose it was with the view of improving it that the suggestion was made to employ waitresses at the Club, who might, as occasion arose, act as models for those members of the Club who desired to go in for a little practical photography now and then. The suggestion, it appears, was rejected. It does not appear that the waitresses were expected to be willing, and qualified, to pose for "the altogather;" probably not, otherwise the suggestion might have been adopted, and a large influx of new members have resulted.

Undismayed by the imminent alarums and excursions of the Club Company meeting, however, the Conference appears to have passed off with great success, the reports supplying some unusually good and instructive reading. At the dinner Captain Abney chaffed the painters who are exhibiting at the Royal Academy for making much (unacknowledged) use of photography. The *Pall Mall Gazette* and Cassell's reproductions of the Royal Academy and other pictures are before me as I write, so also is the Catalogue of the Royal Photographic Society's last Exhibition. The reproductions of many of the Royal photographs—particularly the landscapes—make these out to be every whit as "pictorial" and "artistic" as do the reproductions of the Academy exhibits these latter, and the same holds good with regard to many portraits and figure studies. It is difficult, in fact, to say whether the originals are paintings or photographs. Have, then, photographers so much to learn from the painters, after all? or is it, as Captain Abney seems to hint, that the painters are not above imitating or copying from photographs?

The remarks on pictorial photographic portraiture (p. 295) made by Mr. F. M. Sutcliffe deserve to be pondered by every professional photographer who is ambitious to improve his work and exalt his calling. They tell him, in brief, how to become a genius; for Mr. Sutcliffe's remarks are, on the whole, a plea for taking pains—taking pains to avoid what he brusquely terms the "rotten foundations made on lies such as retouching, imitative accessories, sham landscapes, trees and plants." He also pleads for simplicity of treatment, subject, dress, background; letting the sitter alone; and—by-and-by—one sitter a day! I can forgive Mr. Sutcliffe this last and only real bit of extravagance in an excellent address, which a photographer should hang up in his room and study, for, far-fetched and impossible as some of Sutcliffe's ideas may appear to the sordid sweater, who by means of cheap labour supplies the common herd with *cartes* and cabinets at phenomenally low prices, the thoughtful, aspiring man must discern much in them that points the way to artistic and financial success in his profession.

Reading between the lines of the correspondence on the subject of "Assistants and their Grievances," it is not difficult to believe that, even allowing for some degree of exaggeration, which is pardonable in men and women smarting under tyranny and injustice, a vast amount of sweating still goes on among certain houses that are noted for the cheapness of their photographic productions. It is easy to sympathise with the poor wretches of men and women who have to submit to be ground down in wages; to work intolerably long hours under unfavourable conditions, and in other respects be treated simply as pieces of machinery for the extraction of profits at cheap prices; but it is far more difficult to offer any useful suggestions for helping them out of their troubles. An Assistants' Union would seem to be urgently called for—but who would join it? Not those who are satisfied with their position: so, whence would come the power of a Union composed of men and women with only a week between them and starvation? I hope, however, the correspondence on the subject in these pages will not be allowed to drop. By keeping the attention of the photographic world concentrated upon their grievances, by terrifying the sweating firms with the fear of exposure, much remedial good may ultimately be done by the victims themselves.

M. Jarchy, photographer, of Union-road, Rotherhithe, is like another great man, Mr. C. J. Rhodes; he does not care to face the music. Last September, M. Jarchy stated in print that he intended to hold a show of babies whose portraits he had previously taken *free*, and to offer three prizes, two medals and an oil portrait. Eight months have passed, and a resident in the South of London invites M. Jarchy to state why the Exhibition has not been held. M. Jarchy coyly declines on the ground that the inquirer withholds his name. Well and good; but the Editor of this JOURNAL, on p. 273, associates himself with the invitation, possibly so to have no room left for any refined scruples as to anonymity. So come, M. Jarchy, for the credit and glory of the noble industry of free portraiture, conquer your modesty, and tell us why the baby show was not held; or, if it is to be held, when? But don't call me a "poltron," please, or I may get angry with you.

COSMOS.

HALF-TONE SCREENS BY PHOTOGRAPHY.

II.

HAVING prepared a stock of dry plates, the next point is to prepare for making the reproductions, and here the beginner at that class of work must expect to meet with some disappointments, not only in connexion with the photographic, but also the mechanical, perfection of his work. It is very far from easy, except in theory, to obtain perfection of result in the comparatively easy work of reproducing line engravings, but, when we come to the much finer half-tone rulings the difficulties are vastly increased. In consequence of the fineness of the work, it is absolutely impossible to to watch the process of development in order to judge of density and clearness; this part of the work must be done entirely by time development with a standard exposure and developer, which, of course, have to be settled by practical trial.

Then, again, the mechanical and optical difficulties will be greater than would at first sight seem possible, and it will surprise most operators to find how difficult it really is to secure an absolutely faultless film, for the most minute imperfections that would pass entirely unnoticed in an ordinary landscape or portrait or even line negative will become painfully apparent in a "screen." And it will, perhaps, prove a revelation to many, despite the great perfection to which modern lenses have been brought, how difficult it is to secure equality of definition, and freedom from distortion, especially when the original has to be either reduced or enlarged; though, when the reproduction is of the same dimensions, *i.e.*, the same number of lines to the inch, the influence of the lens can be eliminated.

Under these latter conditions, instead of erecting the screen and copying it as one would an engraving or transparency, I prefer to place it in close contact with the sensitive plate, just as it would be used in making an ordinary half-tone negative. In fact, what is required is simply a dot negative, in which the dots are all of equal size, and this is secured by exposing to a plain white surface instead of to a half-tone picture. In this operation, while we are relieved of all care or trouble in the matter of gradations, we have to concern ourselves with the shape of dot and sharpness, and to arrange the screen distance and camera extension, as well as size and shape of stop accordingly.

Assuming that a cross-line reproduction as nearly as possible resembling the original in point of sharpness, but differing in the ratio

between black and white, is wanted, the way to proceed is as follows: The "stop" will have to be square, as the shape of the dot depends on that, and in order to secure the greatest sharpness, the distance between screen and plate should be as close as possible consistent with the securing of the pinhole lens action of the screen, which is essential in any variation of the size of dot. I speak of the size and shape of stop; but whether this is used with or without a lens does not seem to be very material, for a plain aperture in one end of a long box, if properly proportioned to the length of the box or camera extension, appears to act just as well as if the same aperture were used as a stop in conjunction with a lens.

The essential points to be observed are the adjustment of screen distance and camera extension to produce the alteration in size of dot that is required; but this, of course, will have to be arranged in connexion with a standard exposure and development, as before stated. Let it first be ascertained what exposure and what length of application of a given developer will give the necessary depth of deposit. Then, knowing the ruling of the original screen, and the extent to which it is desired to thicken the lines, or, in other words, how much smaller we want to make the dots than the clear apertures in the screen, it is an easy matter to roughly calculate by the rules of conjugate foci the relative positions of plate, screen, and stop for any size of the latter. Practically, the size of dot, with the standard exposure, will bear the same relation to the size of stop used, that the distance of the screen from the plate does to the length of tube or camera extension. But this will necessarily vary if the exposure be increased, the dot becoming larger, as well as losing sharpness; in fact, the whole business depends upon a very strict adherence to fixed conditions.

It is impossible, in the space at my command, to do more than indicate the lines on which to commence work, but any one accustomed to screen work will be able, in a very short time, to fix up things to answer his requirements, and those comparatively new at the work will learn more in half an hour behind the camera than by reading pages of description. In fact, the theory is plain enough, and it is only in the practical carrying of it out that the difficulties appear, and these can only be mastered by actual experience.

If a round dot screen or vignetted dots be required, a circular stop will have to be substituted for the square one, and, to secure the "softening," the screen distance must be slightly increased, or, better still, two or more exposures, carefully calculated, should be given, with stops of varying size, also calculated to give a dot decreasing in density in regular zones as the edge is approached. Here, again, users of the screen will know how to act.

The first result of this treatment will be a reverse of the ordinary screen, in fact, a series of lines of dots divided by transparent lines, a positive—in fact, from which a cross-line screen can be made by contact printing. But, as each additional exposure introduces fresh chances of defective plates, I prefer to arrive at the final result by the method of reversal with nitric acid or iron alum. This is quite easy under the circumstances of standard exposure and time development, and only necessitates a perfectly even film to commence with. Mottled or irregular films are, however, quite out of the question where reversal in this manner is to be effected, and, if it is not possible to secure the necessary uniformity, it will be far better to resort to the double operation.

In the case of vignetted screens in graduated dots the films may be stripped from the glass by any of the well-known methods in order to permit of the employment of the screens in printing from ordinary negatives or transparencies, an application of the vignette screen that is open to considerable development.

W. B. Bolton.

PHOTOGRAPHY AT THE NATIONAL GALLERY.

Another View of the Question.

This, like most questions, has at least two, and possibly many more than two, sides. One side has already been very ably put before the readers of The British Journal of Photography (page 290). The counsel for the defence has made the best that could be made for what we may call the conservative — or "we-are-all-right-as-we-are" side. But, alas for the perversity of human nature, the article referred to has not carried complete conviction to the present writer. Consequently, to say that the defence failed is only equivalent to saying that the counsel did the best possible with a very bad case. Who can make good bricks without straw?

It is a curious thing that we English folk are never weary of vaunting our freedom. Yet who can deny that we are bound to an interesting assortment of fetishes? One of them we politely term "vested interest." This is the deity which prevents slums being pulled down, roads widened, pure water supplied in abundance, and many public nuisances or inconveniences being removed: "Vested interests" float over the place, millions of people are awe-struck, and terrified into permitting the nuisance to continue.

Of course, the idea of any jealousy, or possibly rivalry, between the amateur and professional photographer is "quite too" absurd; for every one knows that the amateur is only an amateur, and therefore of no real or serious account. Still, it would be better not to alter the present condition of things; it might interfere, &c.

Let us examine, *seriatim*, the heads in the defendants' brief.

"The pictures are the property of the nation." True; but, as the nation is not composed entirely of *professional* photographers, it seems to follow that the amateur has equal rights with the professional. "The Trustees are their custodians." True again; but their function is stewardship rather than ownership, and hence it is part of their duty to see that the pictures are put to the best and widest use. "They are interested in the furtherance of art and its' study." From this it is argued that professionals are permitted to photograph the pictures because they will publish the copies. This, however, is not altogether proven. It may be granted that some, perhaps most, of the pictures are copied with a view to being sold generally. At the same time, it is not at all out of the question that some of the copies have been made by special request, and that one or two copies only were distributed. If a private person were to commission one of the authorised firms to copy some little-known *unpopular* picture, he would expect to pay a substantial fee for the work, knowing that the professional worker might never sell a second copy of that particular subject. In such a case this would be of no great advantage to the nation at large. "The Trustees have in mind that the work should be well done or not at all." This is a neat way of saying that, if it has to be well done, it must be by the professional; in other words, amateurs are duffers at this kind of work. It is curious to notice that there are instances among living painters of repute who have actually been ignorant enough to prefer the rendering of their own paintings by the amateur to that of the professional.

Next it is urged that the amateur "simply photographs a picture for his own amusement," and "that, beyond his immediate circle, no one sees the result." This may or may not be the case, but it certainly is not the entire case; for suppose, if possible, an amateur who took his photography seriously, who made a real study of pictures, and did not treat the whole thing as amusement. Then, again, we might suppose this misguided amateur sending his results to a photographic Exhibition, where they might be seen by a considerable number of people, and meet with quite as much attention as a professional-made copy—one of many in a stock hook or shop window.

"During the time the amateur would be at work he would be monopolising the picture from the public." True, but so would the professional. But why not let the photographers go into the galleries an hour or two earlier than the general public? As to monopolising the picture from the public, the time taken to photograph a picture, say a couple of hours, is as nothing compared to the time taken by art students copying. This may extend over months.

Next we have the argument "that the reproduction of pictures involving an immense amount of time, such as the professional is rarely able or willing to give, it may be fairly assumed that the amateur will monopolise the picture for a much longer time than does the professional. If that be the case, it is a strong argument in favour of the Trustees' refusal." Very ingenious. But bearing in mind that the Trustees recognise the importance of having the work well done, it would seem not impossible that an enthusiastic amateur who would not mind trying two or three times the same picture *might* get quite as good results as a professional who is neither able nor willing to give so much time to the work.

Then, it is urged that the camera man would add to the crowd on students' days. This is a question of degree, *i.e.*, depending upon the relative numbers of the two parties; but what are the reasonable probabilities? Suppose photography were restricted to the two students' days, and that we had, on an average, one camera in each room, how far would this one person add inconvenience?

The counsel, like a wise man, kept his trump card for the last trick This was the question of risk due to moving and unglazing. No one can

deny the risk. The writer would be the last to minimise this most important point, and fully recognises the importance also of reducing this to a minimum. At the same time it is only fair to point out that, if this risk is encountered, it seems hardly just that it should be wholly and solely for the benefit of the professional to the exclusion of the amateur.

Nor must we forget that the great part of the risk could be eliminated (*re* the glazing and unglazing) by a suitable lens hood, with a light frame for curtains, &c., to cut off reflections. Furthermore, it would be no serious matter to combine a camera stand of such a nature that a great many of the pictures could be photographed *in situ*, so that, so far as moving the pictures, there would be no risk at all.

It is, of course, quite possible to imagine an amateur, who is a duffer, who spends hours and pounds and produces only ghostly smudges, and at the same time to conjure up a philanthropic professional spending his skill, time, and money on copying pictures with the sole motive of bringing the National Gallery treasures into every home—*giving* his services, &c., to the lovers of art generally. At the same time, it is quite as easy to imagine our professional friend also a man of business, who deals with the photography of pictures exactly as the reproduction of maps, plans, &c., *i.e.*, entirely as a matter of business that will pay a reasonable return, and at the same time to suppose the existence of a capable and enthusiastic amateur, who is willing to devote his abilities, time, and money to the furtherance of reproducing and popularising the great art treasures of the nation.

It has been suggested that there is an impassable, mighty gulf separating the amateur painter and amateur photographer; but, after all does not this resolve itself simply into a difference of methods, a difference of degree, not kind? Both may be art *students* in the best sense of the term, the only difference between them being comparable to the difference between the painter and etcher or engraver.

At any rate, why not give the suggestion a trial? As a matter of fact, the number of amateurs at all likely to take up this particular line of work—difficult, costly, demanding skill, patience, and *taste*—is really so small, that the question of crowding is practically out of court. At the same time, the very fact of the difficulties being great, and the number of workers consequently being small, is in itself a most cogent reason why every reasonable facility should be offered to the photo-student.

F. C. Lambert.

INTENSIFICATION WITH BROMIDE OF COPPER AND NITRATE OF SILVER.

[Photographisches Archiv.]

A gelatine negative can be intensified to an exceptional degree if bleached in a solution of bromide of copper, for instance:—

100	grammes	of water,
20	,,	sulphate of copper,
20	,,	bromide of potassium,

and afterwards treated with a 10 per cent. solution of nitrate of silver.

This valuable process is, however, much neglected owing to the frequency of failure. Only the recognition of the cause of these mistakes can lead to a safe method of working. I have already drawn attention to several of these errors.

If, after bleaching, the washing is too prolonged, there will be no intensification when the plate is treated with nitrate of silver (*Archiv.*, 1894, p. 337). It must be remembered that the bleached image does not consist of pure bromide of silver, but contains bromide of copper in conjunction with the silver. The intensification is solely conditional upon this bromide of copper.* But the bromide of copper is easily washed out,† consequently the intensification does not occur.

If, after bleaching, the washing had been too short, the intensification, in this case also, could not have taken place. The film of gelatine would then have on its surface a protecting layer of bromide of silver, because the bromide of copper left behind unites with the nitrate of silver, and forms bromide of silver. Only after several applications, or strengthening of the nitrate of silver solution, will intensification take place.

* Because it reduces the nitrate of silver to metal. Nevertheless, the exceptional intensification is not thus entirely explained. According to usual chemical theory the bromide of copper can only reduce so much silver from the nitrate as was primarily contained in the negative. It is much more probable that the adjacent bromide of silver is converted into metal. In a theory of development, which I published some time ago (*Archiv.*, 1894, p. 305), the nascent metal unites with bromide of silver, but even this would only explain the formation of the latter, and not the metal.

† Carey Lea has shown (*American Journal of Science*, 1887, xxxiv. p. 384) that the silver haloids enter into closer combination with the haloids of iron, nickel, cobalt, manganese, and gold, so that the latter cannot be removed by washing. This disposition, however, is not noticeable with the salts of copper.

These occurrences, which usually appear as failures, may, however, be utilised for practical purposes. We propose to discuss them. I also desire to indicate some other processes that may lead to failure.

1st. A badly fogged, finished negative was half plunged into a solution of sulphate of copper and bromide of potassium, until the immersed half was thoroughly bleached. After washing for three hours in many changes of water, it was entirely covered for one minute with the solution of bromide of copper, and the other half bleached also. The entire plate was then rinsed in water for a few minutes, and placed in a solution of nitrate of silver. It intensified. The half which had only been treated once with the bromide of copper, intensified as much as the other, although the bleaching had only commenced. It also showed a strong deposit of fog. On the other hand, the half which had been treated twice with bromide of copper had almost clear glass in the shadows.

This phenomenon, which at first seems remarkable, can be easily explained, because the half that had first been dipped in the solution of bromide of copper had been washed for a much longer time after bleaching. In this way the clearest shadows and the veil, which lay over the whole plate, had lost their capacity for intensification. (The bromide of copper had been washed from those parts, and therefore the reduction of silver only occurred in the denser portions.)

The value of this process is very evident. If it is intended to intensify an over-exposed or otherwise veiled plate, wash it for some time after bleaching with bromide of copper. An under-exposed plate, in which it is necessary to bring up detail rather than greater contrast, should be washed but very little.

2. For the same reason, under similar conditions, a greater degree of intensification may be attained by rapid bleaching with a more concentrated solution of bromide of copper than with a weaker one. In the latter case part of the bromide of copper dissolves.

3. If the negative, after bleaching with bromide of copper, and short washing, is exposed to sunlight, it rapidly assumes a red-brown colour, and there is no appreciable intensification.

If the plate is now kept for half a day in a dark place, the colour disappears entirely. When experimenting some time ago, in connexion with the sensitiveness of copper salts to light, I had a similar experience. Paper prepared with chloride of copper was exposed and then treated with nitrate of silver. A remarkably intense image was obtained. (Here also the strong action of a cuprous salt upon nitrate of silver is apparent, as in the case of intensification with silver.) After keeping the picture a few weeks, I found upon inspection that the half-tones had faded and become an objectionable yellow colour. After a further length of time the entire image faded. (See also a paper by Ley, *Archiv*, 1896, p. 98.)

In both cases the cause was the same. Either there was unreduced cuprous salt in the film, or the cuprous salt absorbed oxygen from the air and passed into the cupric state. The latter then passed on a portion of its bromine or chlorine to the metallic silver and bleached it.

(Similarly the occurrence, which has been noticed before, of an exposed oxalate of iron paper, losing its power of development, after being kept for some time in the dark: the ferrous salt passes into the ferric state—see *Photographisches Archiv*, 1894, p. 321. I am making experiments to ascertain, if possibly the iron salt left behind in Kallitypes, or the addition of uranium and copper salts to collodion emulsion recently recommended by Valenta, operates prejudicially upon the permanence of prints.)

4. After intensification in the silver bath, the negative must be thoroughly washed, so that the remaining silver nitrate may not fog the plate when exposed in the printing frame. It is preferable, in all cases, to again fix with hyposulphite of soda. But, in so doing, great care should be taken. If the plate has been insufficiently washed, the intense black colour will entirely disappear. The salt of copper remaining in the film combines with the hyposulphite of soda, and forms a powerful reducing agent.

R. E. Liesegang.

VOIGTLÄNDER'S IMPROVEMENTS IN PHOTOGRAPHIC LENSES.

Messrs. Voigtlander & Kaempfer, of Brunswick, state that their invention relates to photographic objectives which consist of three lenses cemented together, or of two such systems of lenses.

Its object is to obtain a correction of the spherical aberration or an increase in the sharpness, which is rendered much more perfect than that of the objectives hitherto known, consisting of lenses cemented together.

And, in order to obtain the object in view, the invention consists in a photographic objective, which is composed of three meniscuses cemented together, viz. of two positive and one negative meniscus, the positive one

being between the other positive and the negative menisous, both the last-named menlscuses having a greater refractive power than the intermediate or enclosed meniscus.

Such a system of lenses can be combined with a second equal, symmetrically or oppositely placed, system, or with a second unequal system, for the purpose of formlng a double objective.

A double objective consisting of two equal systems of lensea, the one of which being symmetrical In relation to the other *i.e.* being the mirror image of the latter, produces also sharper images than the double objectives hitherto known.

By replacing in thls double objective the one system of lenses by another, consisting of a double convex lens, a double concave lens and an Intermediate positive meniscus, which latter has less refractive power than both the outer lenses, the advantage is obtained, that thls double objective unites in itself the advantages or preferences of each of the two unequal systems of lenses. The system of lensea in which both the outer lenses

FIG. 1.

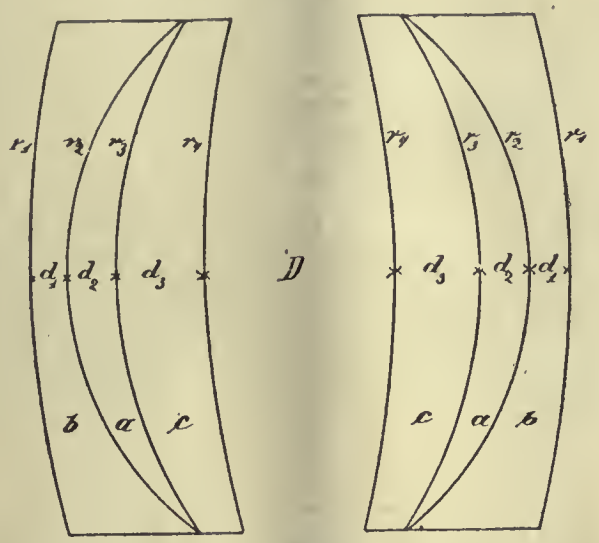
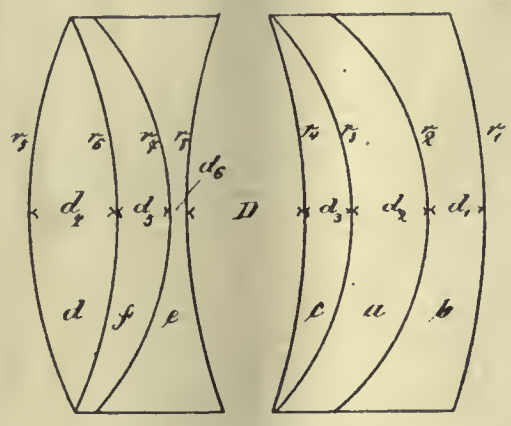


FIG. 2.



are respectively double convex and double concave allows a much more perfect correction of the astigmatism, whereas the other system, in which the outer lenses are meniscuses, does not allow this perfect avoidance or suppression of the astigmatism, but allows, as above mentioned, a much more perfect correction of the spherical aberration.

In the accompanying drawing

Fig. 1 is a double objective, which is composed, according to this invention, of two equal, symmetrically placed systems of lenses; and

Fig. 2 is a double objective, composed of two unequal systems of lensea.

In fig. 1, left-hand side, *a* is the intermediate positive meniscus, *b* the one outer negative meniscus, and c the other outer positive meniscus. The meniscusea, *b* and *c*, have higher refractive power than the middle meniscus, *a*.

In fig. 1, right-hand side, an equal but symmetrical system of lensea is represented.

The component parts of the objectivo shown in fig. 1 by way of example are as follows, if the focal distance is 150 $^{m}/_{m}$ and the aperture is 28 mm.

Radii of curvature.	Thicknesses of glass.	Distance between both the systems.
$r_1 = 49{,}4$ $^{m}/_{m}$	$d_1 = 2$ $^{m}/_{m}$	$D = 10$ $^{m}/_{m}$
$r_2 = 16{,}7$,,	$d_2 = 2{,}7$,,	
$r_3 = 21{,}95$,,	$d_3 = 4{,}6$,,	
$r_4 = 62{,}2$,,		

The refractive indices n are with relation to the Fraunhofer (Wollaston) lines D and F

for the lens *b* . . . . $n_D = 1{,}5682$; $n_F = 1{,}57637$
,, ,, ,, *a* . . . . $n_D = 1{,}5262$; $n_F = 1{,}53347$
,, ,, ,, *c* . . . . $n_D = 1{,}6112$; $n_F = 1{,}61873$

In the double objective, shown in fig. 2, the back or hind system of lenses (right-hand side) consists of three meniscuses, *a*, *b*, and *c*, whereas the fore system (left-hand side) is composed of a double convex lens, *d*, a double concave lens, *e*, and an intermediate positive meniscus *f*, which has less refractive power than the outer lenses.

The component parts of the objective shown in fig 2, by way of example, are as follows, if the focal distance is 510 $^{m}/_{m}$ and the ratio of the said distance to the aperture is 1 : 6,3.

Front system.		Rear system.	
$r_5 = 143$ $^{m}/_{m}$		$r_4 = 156{,}92$	
$r_6 = 105$,,	$d_4 = 18$ $^{m}/_{m}$	$r_3 = 61{,}806$	$d_3 = 11{,}4$
$r_7 = 58{,}4$,,	$d_5 = 10{,}5$,,	$r_2 = 51{,}366$	$d_2 = 14{,}6$
$r_8 = 151{,}8$,,	$d_6 = 4{,}4$,,	$r_1 = 135{,}49$	$d_1 = 13.$

$D = 24$ $^{m}/_{m}$.

The refractive indices are for the lens—

d and *c* . . . . . $n_D = 1{,}6065$; $n_F = 1{,}61404$
f . . . . . $n_D = 1{,}5367$; $n_F = 1{,}5441$
e . . . . . $n_D = 1{,}5624$; $n_F = 1{,}57022$
a . . . . . $n_D = 1{,}5149$; $n_F = 1{,}52156$
b . . . . . $n_D = 1{,}5687$; $n_F = 1{,}57686.$

The patentees' claims are for :—

1. In a photographic objective the combination of three meniscuses cemented together, the intermediate and one outer one of which are positive, whereas the other outer meniscus is negative, both the outer ones having greater refractive power, than the middle one.

2. In a photographic objective the combination of two equal symmetrically arranged systems of lenses, each consisting of three meniscuses cemented together, the intermediate and one outer one of which are positive, whereas the other outer meniscus is negative, both the outer ones having greater refractive power than the middle one.

3. In a photographic objective, the combination of a system of lensea, consisting of three meniscuses cemented together, the intermediate and one outer of which are positive, whereas the other outer meniscus is negative, both the outer ones having greater refractive power than the intermediate one, with another system of lenses, consisting of a double convex lens, a double concave lens, and an intermediate positive meniscus cemented together, the latter having less refractive power than both the outer lenses.

SOME WORK OF THE GLASS INSTITUTE AT JENA.

At a recent meeting of a scientific club at Hamburg, a number of statements were made regarding the work of Dr. Schott's experimental Glass Institute at Jena. This Institute is under the patronage of the Prussian Government, and its purpose is the carrying out of scientific and practical experiments in glass. That it has been fully successful in both is certain. The reputation of the optical and chemical glass made here, and the value of the additions which Dr. Schott and his associates have made to the literature of glass, give this Institute a unique position in the scientific and the commercial world. The success of the glass made here, says the *Pottery Gazette*, is to be attributed, first, to the fact that the number of the elements which may enter into glass as its principal constituents was greatly increased. It was found to be possible to introduce boric and phosphoric acids in place of silica in amounts up to 70·5 per cent., and to make good, durable glass, although the introduction of new bases was also necessary in using these acids. In place of the five elements used for so long a time, the experiments have led to the use of no less than twenty-eight, which can be contained in glass in quantities up to ten per cent. at least. The experiments have been almost entirely with optical and chemical glass, the endeavours being to find the very best glass for the purpose desired, and, at the same time, to establish the connexion between its properties and its composition. Samples of glass made in Jena have been tested by a number of eminent scientists to ascertain the coefficient of expansion. The extremes of the cubical co-

efficient of expansion have been thus found to be 0·00001097–0·00003369. Dr. Schott has, however, made glass with an infinitesimally small coefficient, and, on the other hand, glass whose coefficient is about that of wrought iron. Up to this time the linear coefficient had been put at 0·00000883. It has also been shown that there is a relation between the coefficient of expansion and the kind of materials in the glass, though the proportions of the same do not always exert a great influence. A large percentage of borax in the glass greatly lowers the coefficient of expansion. The great difference in the coefficients of various kinds of glass has been used by Dr. Schott to good advantage in the manufacture of his chemical glass and gauges, and also for thermometers. The glass tubes for the latter purposes are made of two layers of glass, one outside of the other, and these layers are of glass having different coefficients of expansion, that having the smallest coefficient being on the outside. There is a tension, then, away from the point where the two layers join, and, if the glass be suddenly heated, it will be far less liable to burst than a tube made of ordinary glass. For the manufacture of gauges a similar glass is used, only in this case the glass having the smaller coefficient is placed on the inside, and that having the greater on the outside, as the force to be counteracted in this case is not heat, but pressure. In addition, the glass used for the inside of such tubes must be of a composition that will resist water and steam under pressure and at comparatively high temperatures. These gauges are used in the German navy.

The resistance of the Jena glass to sudden changes of temperature is no less noteworthy. It may be heated to a temperature of 300°–400° Fahr., and then plunged into cold water without cracking.

Another specialty of the Jena Institute has been thermometer glass. After laborious experiments, Dr. Schott brought out a glass that is the most satisfactory for this purpose of any yet made, especially with regard to giving a thermometer with a zero point that does not change. His boro-silicate glass, the latest he has brought out, is about the ideal of thermometer glass.

Other ware, principally for chemical use, is made in large quantities here, such as combustion tubes, beakers, and bottles of highest standard of quality.

PHOTOGRAPHY WITH THE BICHROMATE SALTS.*

The concluding lecture of the series upon this subject, organized by the Affiliation of Photographic Societies, was delivered on Friday last, when Mr. W. T. Wilkinson dealt with *Process-work Applications of the Bichromate Salts*. He began by discussing the question as to which of the salts was most suitable for the production of a printing surface, and pointed out that, although bichromate of soda was sometimes recommended, it was almost certain to end in failure, on account of its hygroscopic nature; the potassium salt was most generally adopted, particularly in processes where gelatine formed the ink-bearing surface, and where it was not necessary to dissolve away the parts not acted upon by light; while bichromate of ammonium was best used with colloids soluble in cold water and which had to be dissolved to form the whites, as in photo-zincography. For photo-litho transfers in half-tone nothing equalled the Pretsch process, for which the following formula was given:—

A.

Kreutz's soft gelatine	50 grammes.
Clarified fish glue	15 ,,
Water	200 c. c.

In mixing, first soak the gelatine in the cold water and melt; then add the glue, stirring until it also is dissolved.

B.

Ammonium bichromate	4 grammes.
Water	100 c. c.

C.

Silver nitrate	2 grammes.
Water	100 c. c.

D.

Calcium chloride (crystals)	1 gramme.
Water	20 c. c.

To No. 1 add No. 2, stirring vigorously; next, still stirring, add No. 3; then add sufficient of No. 4 to just discharge the red colour (due to the formation of chromate of silver) and to turn the mixture white; and, finally, stir in eight drops of acetic acid and ten drops of glycerine. After straining through muslin, the solution is to be coated on collotype plates, previously prepared with beer and silicate, allowing six minims for each square inch of surface, and the plates can then be dried at a temperature not exceeding 130° Fahr. When dry, the plate is exposed under a reversed negative until all details can be seen on the back of the plate, when it must be plunged into a warm saturated solution of borax, washed in clean cold water for three or four hours, and dried and etched. Printing is performed as from an ordinary collotype plate, using transfer ink mixed with collotype printing ink, and pulling the transfers upon a good, well-rolled Scotch transfer paper a little hard from age, and they must be put down upon extra smooth stones in the usual way. For photo-zincography and for printing on the metal, Mr. Wilkinson recommended bichromated albumen, the ammonium salt being preferred as sensitiser. For half-tone the same was largely used, but better results were obtained with fish glue, or gum senegal and albumen, the image being subsequently carbonised in order to confer acid-resisting powers. The lecturer next traced the history of Fox Talbot's photo-engraving process, and expressed his opinion that the finest results in photogravure were secured by first coating the metal with a solution of bichromated fish glue, drying, exposing under a single ruled screen of from 200 to 300 lines to the inch, developing in cold water coloured with aniline, and washing, and drying, and burning in. On this ground a carbon negative print could be mounted and developed, or a thin film of gelatine could be spread over it. Other methods of photogravure were also described, and the fact was emphasised that each of the processes which had formed the subjects of the course of lectures required its own particular class of negative, and that the negative must be made for the process, and not the process made to fit the negative. Mr. Wilkinson passed round for examination some examples of three-colour collotype, and specimens of calico and velvet, printed and embossed by means of rollers, upon which the patterns were produced by photographic means. He said the latter process was an entirely new application of photography with the bichromate salts, but he gave no details of it except that photo-lithographic transfers were transferred to the rollers and then etched, the ink acting as a resist. By this means the production of rollers for calico-printing, velvet-embossing, the production of Linerusta Walton and similar materials could be carried out much more rapidly and cheaply than by ordinary methods. He had been working at the process for the last two years, and this was the first occasion upon which it had been publicly referred to.

A vote of thanks was accorded to Mr. Wilkinson for his lecture, and the Chairman, Mr. W. Thomas (the Chairman of the Affiliation Delegates) made some remarks with reference to recent adverse criticisms of the Affiliation scheme in a certain photographic journal, which had described the Affiliation as a corpse. Mr. Thomas, at some length, detailed the work which had been achieved since the inception of the scheme, including the courses of lectures on photogravure, colour photography, the science of development, and the present series, and also the meetings of Judges for formulating regulations as to Exhibitions, and the conference of secretaries of the affiliated societies. He vigorously defended the Affiliation against the "sniggering attacks" of certain papers, and urged the delegates to continue to work steadily and strenuously at the objects in view.

* Concluded from page 295.

THE AFFILIATION OF PHOTOGRAPHIC SOCIETIES.

[London and Provincial Photographic Association.]

The fourth year's work of the Affiliation Committee having closed, I feel it my duty, as one of your delegates, to make a report of what has been done, and give my opinion of the future of this Committee. It has been given a fair chance of securing a position in the photographic life of the country, and, as application has been made for the renewal of our subscription, before asking you to vote, I feel compelled to take your opinion upon the probability of any further useful work commensurate with the expense incurred.

After the formation of the Committee, a lecture was given by Professor Meldola, in which he referred to the work that might be undertaken by the Royal Photographic Society through this channel, and he recommended a Technical Institute as the goal of our efforts. It will also be remembered that, after the abortive scheme of Mr. Biden, the Royal Photographic Society placed itself at the head of this scheme of Affiliation, sketched a programme, and invited the attendance of delegates from the other photographic societies to discuss the matter and carry it into effect.

I was sent as one of your representatives, and must say that, after the first meeting, I had considerable doubt of the success of the movement, as the parent Society seemed far too anxious to retain absolute control over the Committee. At the same time it was very sparing of its liberality in the financial arrangements. It insisted on the right of veto in any work we might undertake, and asked for half the subscriptions for secretarial expenses and use of rooms. But, though the parent Society claims so large a right in the management, and has three delegates, it makes no contribution to the funds. It stipulated for all the power of a parent, but repudiated its duty of support. In fact, we were given to understand that we must provide for our own maintenance. Such were the conditions of our start in life, and it is not surprising that we have failed to reach manhood. We made a bold struggle for existence, and I look upon the first two years of our work as fairly prosperous, considering the disadvantages under which we laboured. In those two years we gave two courses of lectures, the subjects being *Photogravure* and *Colour Photography*. We made several collections of lantern slides, which have had considerable circulation, we tackled the knotty question of judging at photographic Exhibitions, and some lectures were given gratuitously by our old friend, Mr. W. E. Debenham, before some of the affiliated societies. The lectures on *Photogravure*, by Mr. Denison, of Leeds, are deserving of special mention, as they were the first of the kind, and gave a decided impulse to the process in this country. Meanwhile, the weaknesses of the scheme had made themselves felt. We were delegates

from societies scattered throughout the country—even India was represented—but at what points were our interests in common? Our funds were far too small to permit even the thought of founding a Technical Institute or school. We were all anxious to secure material for the programmes of our individual societies, but for this purpose also our means were too limited, and we could not afford to send out lecturers. Other questions, such as securing greater facilities for railway travelling, were considered; but, with regard to the railway companies, I must say that the half-hearted manner in which the request was made rendered the prospect of failure almost certain. Had there been an honorary secretary with some enthusiasm for the work, petitions might have been presented from the societies throughout the country, members of Parliament might have been approached, and, though it is easy to make unwarranted assumptions, I think some minor concessions would have been obtained, if even a full measure of success was impossible.

During the last two years the difficulties of our position have been so apparent that little else has been undertaken other than the annual lectures; but, throughout the whole of these four years, what help have we had from the parent Society in accomplishing useful work of importance, or in attempting to realise Professor Meldola's idea?

I think I may say that the assistance has been merely nominal until this year, when the room of the Society was placed at our disposal for the lectures on the bichromate salts. It may savour of ingratitude, but I venture to say that this service has been of very little use. Situate at the west end of the town, the room is of no practical value for such a course of lectures. It is out of convenient reach for most of the London societies, and I would strongly advise, in the event of future lectures, that a room in the City be selected. That these lectures should now be the only useful work of the Affiliation Committee is strong evidence in favour of Professor Meldola's idea that a Technical Institute should have been the aim of the parent Society.

And now as to the future. I think these lectures, if they are to be continued, can be as well carried on by the parent Society alone, and I would therefore recommend that this Society withdraw from Affiliation. I see no adequate result for the money spent by the Committee, and I am strongly of opinion that the Committee should be now dissolved. If other societies will follow in the steps of the London and Provincial, the Royal Photographic Society will have to reorganize the scheme, carry on the work alone, or abandon it altogether. We shall then ascertain if it has any real interest in organizing the photographic societies throughout the country for a common purpose, whether it desires to be the centre from which a Photographic Institute may spring, or whether it will follow in the footsteps of some other learned societies and retire to the respectability and somnolence of a west-end square.

If the Royal Photographic Society desires to increase its power and influence, it will keep in touch with the best and largest of the photographic societies throughout the country. As a means to such an end, I would suggest that, in place of the Affiliation Committee, the Royal Photographic Society should offer membership to one or two delegates from each approved society on the same terms of subscription as to the Affiliation Committee. It is as much as most of the societies can afford for such a purpose. A scheme on these or similar lines would gradually centre activity in photographic matters in the Royal Photographic Society. Should any subject of general interest then arise, or should common action be necessary, these members would feel it their duty to ask the co-operation of those societies they represented. In this way there would be constant means of communication and community of interest, and the best blood of the societies would be drawn to the parent Society, and it might then reach the position of an influential body reflecting the opinions and aspirations of photographers throughout the country. A royal charter may be of considerable financial value, but the letters F.R.P.S. will be a mere empty appendage unless the Society attains a commanding position.

P. EVERITT.

A SYNOPSIS OF THE PROGRESS IN THE NEW RADIATION.

[Photographic Club.]

WHEN your Secretary some two weeks ago kindly asked me to give you an evening's discourse on the new radiation, I felt some diffidence in bringing before you again a subject which had been so ably and fully demonstrated to you but a short while back by our co-member, Mr. H. Snowden Ward, and which has since been mentioned, *ad nauseam*, in the professional and lay press. But, on second consideration, I decided that it might, after all, prove interesting, and perhaps useful, to the members, or at least to those who follow the development of this new branch of our science or art (?), to have a synopsis of the progress made since the first announcement of the discovery by Professor Röntgen.

It must have struck even the casual observer that the literature which the new discovery has called into existence is unparalleled in the annals of scientific evolution, taking into consideration the very short time of its existence, and to the careful and interested observer the mass of facts brought to light is bewildering, more especially since many of these facts, or at least reports, are so diversified, contradictory, vague, and irrelevant. As a matter of fact, the subject is so very abstract and of such intense theoretical and practical interest, that a systematic and exhaustive classification of the various rediscoveries and observations would be by no means an easy task, and at some later date would be well worth the attention of our great scientists. What I can do this evening is simply to consider the whole subject of X ray photography, or shadography, or radiography, or whatever else you may please to call it, from five distinct points: (1) The question of priority of discovery; (2) the advances made in its explanation; (3) the improvements effected in the means of working; (4) the practical results obtained; and (5) its inherent possibilities.

Taking first the question of priority, it would have seemed almost ridiculous to pause for a moment to discuss this point when the discovery was first announced. But since then a host of disappointed, and up to now more or less obscure, amateur experimenters has suddenly sprung into temporary existence, who claim priority, and I do not think it advisable to waste your time in enumerating them; but I should like to express my surprise that one of our leading electrical periodicals, in a recent interview with Mr. H. Jackson, of King's College, has thought fit to pose this gentleman as having anticipated all Professor Röntgen's work. There is no doubt that the chain of scientific progress which has made Röntgen's discovery possible has been chiefly made in England, if I may be allowed to use a very hackneyed expression. The splendid researches of Clerk-Maxwell, Lord Kelvin, Professor Crookes, and Professor Lodge have decidedly been most important links, without which this latest addition to the science of electro-optics would never have been made; but the subsequent work of Hertz, Lenard, and Röntgen is unique, and ought not to be made the subject of international jealousy. Science is the inheritance of mankind, and its furtherance the duty of the human race irrespective of nationality.

It is certainly no mere chance that great discoveries are so very often made almost simultaneously by some kind of mental telegraphy, and spectrum analysis, the discovery of the mechanical equivalent of heat, the telephone, &c., furnish points in question; but the credit of every discovery must be given to the man who is the first to publish and scientifically investigate it.

It is not so easy to dispose of the second point. There are at least a dozen different theories brought forward to account for the properties of the new radiation, and some of these theories, in order to sustain their useless existence, have to depend upon most unscientific assumptions.

Briefly stated, there are at present three *reasonable* main directions along which the explanation of the new rays may be expected. First, there is the theory that these radiations are the long-looked-for longitudinal vibrations of "ether," and this theory has the weighty support of Lord Kelvin and Professor Röntgen himself. The second theory (which represents the majority of English scientific opinion) is that the X rays are transverse vibrations, similar to ultra-violet waves of minute wave-length; and the third regards the action of the rays as some mechanical manifestation of a stream of material particles propelled with tremendous force, somewhat similar to a refined sandblast.

It would carry me too far to attempt a review of the *pros* and *cons* of these three theories, and, being exclusively of an electrical nature, it would certainly not come within the scope of this Club, so we will pass on to the more practical third point under consideration, namely, the improved means of working with the X rays; and here it may safely be stated that the most important progress is due to the experiments of English investigators.

When, shortly after the publication of Professor Röntgen's paper, some few experimenters who were fortunate enough to possess the necessary apparatus took up the work, they were obliged, owing to the meagre working instructions given by Professor Röntgen, to find out the best practical conditions, and naturally they started with Crookes' tubes, which they happened to possess, and which were, as it turned out afterwards, most unsuitable. In order to improve upon their results, they tried more powerful apparatus, higher electrical vibration frequencies, and the like, and so we find Mr. Campbell Swinton at first emphasising the necessity of using so-called "Tesla" currents. Perhaps few of you realise the difficulties and inconvenience of this otherwise most interesting and promising Tesla apparatus; but suffice it to say that it requires very skilled electrical manipulation, that it is a complicated arrangement, and that special tubes are required. In addition, the noise it makes is sufficient to shake all but very hardened nerves. (I have here a very small sample of this noise, which I hope you will appreciate.)

The chief characteristic of a "Tesla" coil, as compared with an ordinary "Rhumkorff" coil, lies in the fact that, whereas the latter, by means of its electro magnetic interrupter, only breaks the current about 150 to 250 times per second, the "Tesla" coil is worked with oscillating currents surging to and fro several million times per second, which high rate is attained by the use of a condenser or Leyden jar spark gap; and it is this latter which causes the above-mentioned objectionable noise.

Very soon, however, it was found that equally good results could be obtained by using the ordinary induction coil alone, and so we find very few experimenters using the "Tesla" arrangement to-day, although Tesla himself has naturally been working with his apparatus and obtained excellent results, particularly as far as penetrative power is concerned. (He obtains shadowgraphs at forty feet distance.)

As regards the size of the induction coils used, the length of the spark very soon reaches a limit in radiography, very long sparks being un

pleasant things to work with, and also apt to injure the tubes. A six-inch or eight-inch spark is sufficient for any case, and little is gained by increasing it.

The most important item, however, is the vacuum tube, and it is here that most important advances have been made.

It was at first generally assumed that any vacuum tube of very high exhaustion was suitable for the work, and so there exist a number of various shapes, &c., which, although of very good quality as regards exhaustion, necessitated what we now consider long exposures (say, twenty-five minutes for a hand), and which also failed to give the desired definition of the images. As long as a tube showed the characteristic apple-green fluorescence, it passed as suitable. Of course, as in the case of ordinary light, the more the source of the radiation approaches the size of a point, the sharper would the shadows be, and this condition was far from being fulfilled in the early tubes, the fluorescent patch on the glass from which the X rays were supposed to emanate being about one to two square inches in area, and so causing indistinct images.

A really important step forward in the construction of the tubes was made when it became generally acknowledged that the place or point from which the X rays start is always that portion of the tube where the cathode rays (that is, the stream of electrified particles shot off from the negative pole) strike against a solid substance. In the case of the older tubes with flat cathode discs, the cathode rays were a cylindrical bundle which was intersected by the tube wall, and so produced the X rays from a round area. (Demonstrated.) On making the cathode a concave disc, the cathode rays are given out as a cone-shaped bundle, and if we place a solid substance in or near the centre of curvature of this disc, or, in other words, in its focus, we have the X rays starting from this focus point, and thus get what we want, namely, definition. The solid in the focus is mostly a plane piece of platinum, as it will allow no X rays to pass through, it being very opaque to them, but will reflect them or send them all outwards on to the object to be radiographed. This tube, which is said to have been elaborated by Mr. Herbert Jackson, of King's College, is, in fact, a tube which has been used by Professor Crookes in 1877, although for different purposes. We also know now that the green fluorescence is not essential to the presence of X rays, but is a secondary phenomenon, so that a tube may work very well, even if it remains almost dark.

Another point lately recognised is that the vacuum of a tube increases after prolonged use, so that it requires higher electrical pressure (a longer spark) to send the electric discharge through it. It is assumed that the metal electrodes inside the tube absorb some of the remaining oxygen in the tube, and, in order to bring the vacuum again to the proper degree, the tube will have to be put on the mercury pump again, or, for temporary repair, it may be warmed, in order to liberate the air which is condensed or adhering on the inner walls.

The various attempts made to replace the glass walls of the tube, which are rather opaque to the X rays, by aluminium, are not practicable yet, and introduce a lot of mechanical and electrical difficulties without corresponding gain.

The last, but not least, important requirement for the production of photographic records of these shadows is the plate. It was at first assumed that, as the new radiation was most likely very different from light, the speed of the plate was of no importance; but I think every one who has tried his hand at the new game will find that a very rapid plate, and one which is rich in silver or thickly coated, will give the best results.

In this connexion I venture to suggest the value of intensification in order to increase the contrasts; and it has been my invariable practice, when developing radiograms, to underdevelop the plates with hydroquinone (giving chalky negatives), and to strongly intensify them after.

In confirmation of my remarks in the preceding paragraph regarding the speed of plate required, I can only refer to an experiment I made some few days ago, when I had to increase the exposure of a certain object to *treble the amount*. All other conditions remained unaltered, but I was using a somewhat slower plate.

I personally do not think that very much can be done to improve upon or adapt the present plates for X ray work, unless we coat them more heavily, and perhaps embody certain substances like fluor spar with the emulsion. This is likely to do away with some of the definition.

Of the various attempts to decrease the exposure necessary for shadowgraphs, very few of those that have been suggested have survived. We hear now little or nothing about the effect of warming the plate or steeping it in chloride of iron or sulphate of quinine, &c., or taking eosine orthochromatic plates.

A series of most promising experiments, however, that have lately been carried on at the University of Jena should be mentioned here, as they are likely to prove a step in the right direction. It has been often suggested to increase the X ray action by placing a fluorescent screen, such as I shall describe later on, in contact with the film; but this rather tends to scatter and diffuse the light, and, as Professor Oliver Lodge points out, "this would be a poor exchange for the straightforward penetrating power of the X rays, and may be a step backward."

If, however, fluor spar in plates or in the crushed state be brought into contact with the sensitive film, a new kind of rays, likewise invisible, not fluorescing, are produced, which, acting back on the film, increase its sensitiveness to X rays about one hundred times, so that a few seconds' exposure will produce the same results as do now two minutes; but this process is far from complete, and much remains to be done.

There will be most naturally a certain granular or marbled appearance of the plate after development, but I scarcely think this matters much, as it does not interfere with the proper diagnosis of fractures and dislocations, &c., and even the location of needle fragments, &c., will be possible.

As regards the practical results obtained, they have, up to the present, been chiefly of benefit to the medical profession, or, more strictly speaking, to the surgeons. There are a few isolated cases of technical and industrial applications, but they are few and far between.

The surgeons, however, have certainly every reason to congratulate themselves on this latest acquisition.

The number of bullets, fragments of bones and needles, found in the extremities and body is remarkable, and make us wonder how the world got along before Röntgen's discovery. The X rays have been showing us foreign bodies accidentally swallowed or lodging in the pharynx or gullet; they have shown us the blunders made by surgeons in setting fractured bones, &c., and they have also somewhat modified the views held even by eminent physicians as to the position of certain bones in the body.

I have here, through the courtesy of Mr. Vasey, of the *Lancet*, some specimens of the most remarkable cases which have come under his notice, and which I shall pass round. They are rough proofs only, as the negatives have been mislaid. In addition, I pass round some of my own results, and later on will show some slides. But these results, perfect as they are, do not suffice, and the question I am almost daily asked by doctors and others interested in the process of radiography is, Will it be possible to photographically record, or even to see by means of the screen, the internal non-calcinous or non-osseous parts of the body, such as heart, lungs, kidneys, &c., and also such highly inconvenient formations as gallstones, tumours, &c.? And the answer to this question, which is in the affirmative, brings me to our next and last point, the possibilities inherent to radiography.

It has of late very often been stated that the electrician has done for the new process as much as his science or art will permit, and that it is now for the photographer to further improve and perfect it, a prospect which would be very cheering, as it would add another very lucrative field to the operations of the professional. Well, I am afraid that I cannot quite see matters in this light, and for the following reasons:—

It has recently been found that what we are wont to call X rays are in reality a bundle of X, Y, Z, and ever so many more mysterious and unknown rays, which have all different properties—in other words, that the X radiation is heterogeneous (similar to a bundle of light rays of various colours, which would affect an ordinary plate to a different degree).

Some of these rays, let us say the X rays, do not penetrate bones and metals, and so produce the shadow pictures with which we are now familiar. As all our results are so far alike, save for details, we must assume that these X rays are largely preponderating. It is, however, possible to place the Crookes' tube into such an electrical condition that these bone shadows do not appear, which shows that, under certain circumstances, Y or Z rays are in abundance, and of X rays there are but few. It is by no means improbable that in this difference of penetrative power we may look for the ultimate solution of the problem to make the whole internal mechanism of the body visible. The conditions governing this different emissivity of the tube are entirely of an electrical nature, and it will be an electrician, and not a photographer, who will devise means of filtering or sifting these rays, and making their separate application possible.

To put it in photographic analogy: We want to find and reproduce the three primary colours, or any number of primary rays, whose aggregation at present we designate as X rays. Of course, the photographer will find a new field of activity through the new process; I have no doubt that every infirmary or hospital will in future require its photographic assistant, not only for the New Photography, but also for the ordinary photographic registration of cases for reference purposes, a thing that certainly ought to prove very valuable for clinical and educational purposes.

But even here the poor photographer meets already with a competitor in the shape of the fluorescent screen, or cryptoscope, or fluoroscope, a most simple piece of apparatus, which, however, has had the distinction of being invented four or five times during the last three months.

Those who followed the first scientific reports of Professor Röntgen's original discovery will remember that it was this very screen which led Professor Röntgen to his remarkable discovery, since he accidentally observed fluorescence where he did not expect it. A month after, we read most startling newspaper accounts of Professor Salveoni's discovery of the cryptoscope to make the X rays visible, we heard of various English experimenters improving upon it, and not long ago Edison himself was magnanimous enough (for the first time in his life, as he himself acknowledges) to give to the world his fluoroscope free of patents, &c. Well, all these full-sounding names denote the same thing, which I propose showing you to-night if my tube works well enough.

The screen is simply a piece of paper coated with some salt, which, under the action of the X rays, becomes fluorescent. If we interpose an object between the source of the X rays, that is, the tube and the screen,

we will get a shadow or non-fluorescent spot on the screen wherever the X rays cannot penetrate the object. It is, in fact, the same as if you take a candle in a dark room and hold between it and a ground glass an object which is partly opaque and partly transparent, you get a shadow picture on the ground glass. The lantern slide will make this clear.

The various screens, of which I have a selection here, differ only in the nature of the fluorescent salts.

There are about seventy-two such salts known, which are more or less suitable, but at present three are chiefly used, viz., the original platinocyanide of barium, the platinocyanide of potassium suggested by Mr. Herbert Jackson, of King's College, and the cheaper calcium tungstate recommended by Edison. The preparation of the salts and the spreading on the screen is a matter of some difficulty, and the screens are at present rather expensive. I shall now try and show its detective powers to the members in small batches, as it is necessary to come very close to the screen. Before doing so, however, I should like to end this discourse by pointing out that Professor Röntgen certainly deserves all the more credit for his discovery, because he at once made it public without in any way trying to secure pecuniary advantages from it. He thus enabled the scientific workers of all countries to take it up and to bring it to a pitch of comparative perfection within such a short time as, of course, would not have been possible had a single man, however prominent and skilled, tried to elaborate and improve it.

It would be rash at present to attempt to predict the outcome of the experimenting going on now, but it is certain to bring us an appreciable step nearer to the ultimate solution of the nature and composition of all matter and the fundamental law governing all existence.

A. W. Isenthal.

THE W. H. HARRISON FUND APPEAL.

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Further donations are most earnestly requested, and will be thankfully acknowledged by

Fredk. H. Varley, 82, *Newington Green-road, London, N.*

Our Editorial Table.

Marion's Adhesive Film-holder.

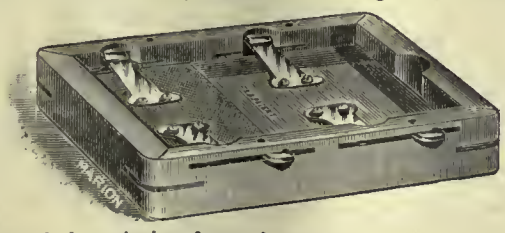
Marion & Co., Soho-square, W.

Users of cut films, among whom we not infrequently count ourselves, will welcome these film-holders which consist of thin sheets of ebonite, coated with a substance that retains its adhesive properties unimpaired for many months. The films readily adhere, and are as readily detachable.

A New Printing Frame.

Marion & Co., Soho-square, W.

The advantages claimed for this printing frame are that it is neat; occupies a small space; that the fixing of the back in position is done by means of a downward movement only, thus obviating any possibility of displacing the print, and that evenness of pressure over the whole of the plate and quickness of working are also obtained.



The back of the printing frame is released by four small spring catches shown in the illustration, and the back itself, being unequally divided, allows of rather more than half the print being examined when occasion demands. It is a capital frame, and, especially for securing perfection of contact in printing, a point not always assured with ordinary printing frames, should be found very useful.

The Wellington Film Varnish.

Wellington & Ward, Elstree, Herts.

An excellent varnish for films is being sent out by Messrs. Wellington & Ward. It requires no heating. For use, sufficient varnish is poured into a flat porcelain dish, and a single film immersed therein. It should then be raised by very slowly lifting from the solution, and pinned up by one corner to dry. The varnish is primarily intended for use with the Wellington film, to which we have already referred.

Marion's "Plate Separator."

Marion & Co., Soho-square, W.

This is a simple contrivance, designed to prevent plates damaging one another when two or more are being developed in the same dish. The corner of the plate is placed in the corner of the separator, which is apparently made of celluloid, and cannot then slip over its neighbour and damage the film. To the hand-camera worker,



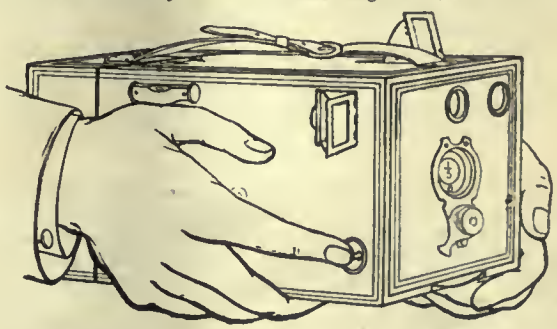
especially, with numbers of plates to develop, and to photographers generally, these handy little separators should be a comfort in working.

They may be obtained to accommodate two or four plates; the illustration shows one made to take the larger number.

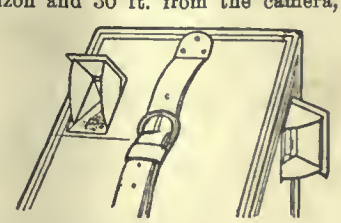
The No. 3 (5×4) Frena.

R. & J. Beck, 68, Cornhill.

Messrs. Beck are introducing a 5 × 4 Frena which is slightly more bulky, and somewhat heavier, than the quarter-plate size, but is in other respects very much on the same model. The following is a description of the instrument:—The finders are decidedly larger, and the Frena magnifiers for photographing near objects are an integral portion of the camera. Below the front board of the camera is a revolving disc of ebonite, which has five cells and one blank space; four of these cells carry the four Frena magnifiers, and one of them



is an empty aperture. The edge of the blank magnifier disc projects slightly from the bottom of the front board of the Frena, and by this edge it may be revolved so that each of the cells may be respectively brought in front of the lens. To close the camera, the blank space of ebonite is brought in front of the lens. By revolving it until the first click is felt, the empty cell is brought into position, and the lens of the camera is opened; when this it done, it will be noticed that the uncovered edge of the disc at the bottom of the camera has engraved upon it "distance to 30 ft.," indicating that the camera as used in this state will give sharply defined pictures of all objects between the horizon and 30 ft. from the camera, with the normal



aperture of the lens *f*-11. Upon revolving the disc to the next click, the first Frena magnifier is brought into position, and the engraving on the exposed edge of the disc reads 30 ft. to 12 ft.; objects situated at this distance from the front of the camera will now be in focus.

The second magnifier gives objects sharp between 12 ft. and 6½ ft.; the third magnifier, those between 5½ ft. and 4½ ft.; and the fourth, those between 4 ft. and 3½ ft. Thus the camera can be set to the right focus, according to the objects which it is required to photograph, by the revolution of this ebonite disc, which also by a further revolution closes the camera entirely.

It will be seen from the description that a high degree of adaptability to the varied requirements of the hand-camera worker has been attained with the No. 3 Frena, which we have no doubt will be much appreciated.

Tyree's Litmus Pencil.

Thos. Christy & Co., 25, Lime-street, E.C.

This convenient tester has the appearance of an ordinary pencil, in which chemically pure blue and red litmus are inserted. It is stated to be characterised by such extreme sensibility that it will detect one part in a hundred thousand (100,000), whereas litmus paper can only detect one part in fourteen hundred (1400). For use it is directed to sharpen the ends as one would any ordinary lead



pencil, mark on a strip of white paper and insert the paper in the specimen to be tested. If the blue changes to red, acid exists; if the red turns blue, alkali is discovered. The ends should be dampened when in use. It is a handy and economic device, which all those who have to do with chemical reactions will appreciate.

The Sylvio Paper.

Wellington & Ward, Elstree, Herts.

Messrs. Wellington & Ward send us samples of their most recent make of the "Sylvio" gelatino-chloride paper, of which it is only just to say that its continued excellence and carefulness of manufacture entitle it to a front place among print-out papers. We note that the phosphate toning bath is recommended. This, a favourite bath with ourselves, gives tones of a peculiarly rich plum-coloured hue. Here is the formula for those who are disposed to try it:—

Phosphate of soda	40 grains.
Gold chloride	2 „
Water	16 ounces.

The bath should be used as soon as it is mixed.

The Perfect Developing Dish.

Marion & Co., Soho-square.

This dish is constructed with a well into which the plate fits exactly, the depth coinciding with the average thickness of plates in general use. Around the sides of the well is a narrow rabbet, the top of which is flush with the top, or film side, of the plate. At one end of the rabbet is a semicircular depression to facilitate the easy removal of the developed plate.

Among the advantages claimed by the foregoing arrangement are these:—

An easy uninterrupted flow of the developing solution, economy of solution, evenness of development. The Perfect developing dish has evidently been devised by one keenly alive to niceties of convenience in handling plates during development. It embodies some happy ideas.

Received: *Fallowfield's Remembrancer* for May. Replete with particulars of the newest introductions upon the photographic market, a perusal of Mr. Fallowfield's ever-welcome *Remembrancer* is calculated to be a source of pleasure and profit to the photographer.

News and Notes.

Royal Photographic Society. — Photo-mechanical Meeting, Tuesday, May 19, at 12, Hanover-sqnare, at eight p.m. *Photo-mechanical Methods in Austria*, by Ignatz Herbst.

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, May 20. Mr. R. Child Bayley will read a paper entitled *Photographic Societies and Photographic Art.* Visitors will be welcome.

Mr. Edison is reported to have said to a press representative that he discovers "a great many things that I would be glad to give to the public for nothing, but I dare not. I have to patent these things to save myself from defending law suits. There are a lot of sharks in this world who are continually on the look-out for new things, and, when one of them hears of something new, he bustles to the Patent Office to see if it is patented. If it is not, he claims it as an original discovery, and files his claim." Then, it appears, law suits follow, and all this in spite of the fact that the United States maintains a large staff of examiners in the Patent Office.

Derby Corporation Exhibition of Photographs.—This Exhibition, to be held in the Art Gallery, Derby, will open about July 1, and remain open ten weeks, and works will be received at the Art Gallery on Monday, Tuesday, and Wednesday, June 22, 23, and 24. The Committee will award gold, silver, and bronze medals for the best works exhibited in the various classes. Jurors will be appointed to make the awards, and the Committee reserve to themselves the right to withhold any of the medals offered if, in the opinion of the Jurors, there are no works of sufficient merit in any class to warrant their being given. In connexion with this Exhibition there will be a display of works produced by processes dependent upon and akin to photography. All works must be sent, carriage paid, addressed to Mr. W. Crowther, Art Gallery, Derby, of whom entry forms and all further particulars may be obtained. The following medals will be awarded:—Two gold medals, one for portraits, groups, or *genre* pictures; one for landscapes, architecture, or any subject not coming under the above classification. Silver and bronze medals in each of the following classes: C, Landscape, Seascape, or series of; A, *Genre* or Figure Pictures, or series of; D, Architecture (interior and exterior), or series of; B, Portrait, or series of (not more than six frames); E, Instantaneous Pictures, or any other Pictures of special merit not included in the above classes, according to the discretion of the Judges. The Exhibition will not include lantern slides.

The Sixth Annual Exhibition of the Wolverhampton Photographic Society was held on Tuesday evening, May 5, in the Assembly-room of the Wolverhampton Blind Institute, Victoria-street, a large company being present. The Exhibition was regarded as satisfactory, the number of photographs exhibited numbering 138, besides nearly fifty photographic lantern slides. The standard of excellence observed in former years was fully maintained. The Exhibition was divided into six sections, and certificates of merit were awarded to the best productions in each section, the Judges being Dr. Hall-Edwards and Mr. E. C. Middleton, of Birmingham. In the section devoted to Landscapes and Seascapes, certificates were awarded to Mr. H. E. Perry, for the photograph *Waiting;* to Mr. J. Gale, for *The Evening Hour;* and Mr. G. Hanmer, for *A Lane at Chesterton.* In the Architecture Section, awards were secured by Mr. J. Gale, for *Stokesay Castle;* Mr. H. E. Perry, for *Newark Castle;* and Mr. J. Stokes for a view in Aston Hall. Mr. H. E. Perry was successful in the Hand-camera Section with two views, *Inward and Outward Bound* and *Norfolk Natives;* in the Enlargements Section, with a view of *The Angel Choir* of Lincoln Cathedral; and in the section devoted to Animal and Flower Photographs, with the picture *Animal Courtesy.* In the course of the evening the lantern slides were illuminated and shown upon the screen, Mr. Gale acting as lanternist. After the Exhibition, awards were made to Mr. J. Gale and Mr. H. Holcroft, each for a set of three views. At the close a vote of thanks was accorded the Judges on the motion of Mr. H. E. Perry, seconded by Mr. H. Holcroft. In reply, Dr. Edwards said that the lantern photographs were exceptionally good, and might be exhibited with success anywhere.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
18.....	North Middlesex	*Intensification and Reduction.* W. Taylor.
18.....	South London	*Successful Portraiture.* Nahum Luboshez.
19.....	Birmingham Photo. Society ..	*The Choice of a Subject.* W. S. Herton.
19.....	Brixton and Clapham	Ordinary Meeting.
19.....	Gospel Oak	*Composition.* C. Stone.
19.....	Hackney	*A Chat about Advantages of Carbon for Making Enlargements.* J. A. Sinclair.
19.....	Leeds Photo. Society	*Platinum Printing.* T. W. Thornton.
19.....	North Surrey	Hints on What to Do and What Not to Do in the Field during the Holidays.
19.....	Royal Photographic Society ...	*Photo-mechanical Methods in Austria.* Ignatz Herbst.
20.....	Borough Polytechnic	*Photo Chemistry.* J. D. Evans.
20.....	Croydon Camera Club	*A Talk about Successful Portraiture and Bromide Papers.* Mr. Luboshez.
20.....	Photographic Club	*Photographic Societies and Photographic Art.* R. Child Bayley.
21.....	Ashton-under-Lyne.....	General Meeting to Receive Reports of the Rambles and to Compare Results.
21.....	West Surrey	*Clouds and Cloud Negatives.* G. H. James.
23.....	Borough Polytechnic	Excursion: Richmond Park.
23-25	South London	Excursion: Brockenhurst and New Forest District. Leaders, C. H. Oakden and A. E. Allen.

ROYAL PHOTOGRAPHIC SOCIETY.

May 12.—Ordinary Meeting,—the Earl of Crawford, K.T. (Vice-President), in the chair.

Election of Judges.

The Hon. Secretary announced that the following gentlemen had been elected to act as Judges at the forthcoming Exhibition, viz., *Art:* Mr. F. P.

Cembrano; Colonel Gale; Mr. B. W. Leader, A.R.A.; Mr. G. A. Storey, A.R.A.; and Mr. W. L. Wyllie, A.R.A. *Technical:* Captain W. de W. Abney, C.B., R.E., &c.; Mr. Chapman Jones, F.I.C., F.C.S.; and Mr. Andrew Pringle, F.R.M.S.

Mr. J. B. B. WELLINGTON read a paper upon the subject of his

NEW STRIPPING FILM,

demonstrating the operation of stripping, and exhibiting specimens of the film in the various stages of manipulation, which were fully described in our issue of May 1, page 284.

Mr. ALFRED WATKINS read some notes on

THE PYRO-DEVELOPED IMAGE.

Starting with the fact that a pyro-developed image is warmer in colour than that produced by other developers, and that the colour is dependent to a considerable extent upon the presence or absence of sodium sulphite in the developer, he said that, when all the silver was removed from such a negative, a yellow-brown image was left, varying in intensity with the gradations of the exposure, indicating that the stain was not caused by any action of the reducing agent. Comparative experiments in pyro development, with and without sulphite, the results of which were illustrated by means of lantern slides, showed that an equal intensity of the no-sulphite negative contained less silver and more pyro image than the negative developed with sulphite, and that the yellow image seemed to follow the same law as the silver image in respect of the relation between intensity, exposure, and development. When negatives developed with hydroquinone, rodinal, amidol, ferrous oxalate, eikonogen, or metol, were reduced with cupric bromide and hypo, clear gelatine only was left, but pyro metol gave the characteristic yellow image, which was exceedingly permanent, for unsuccessful attempts had been made to reduce it by means of acid alum, thiocarbamide, and other agents. Another slide showed that the black silver image obtained by development with metol, superposed upon the yellow pyro image, reproduced the character of the original pyro-developed negative, pointing to the conclusion that the latter was formed of two constituents, the black silver deposit and the yellow pyro image. The presence of free bromine and pyro seemed necessary to the formation of the latter, and, when sufficient sulphite was present in the developer to absorb the bromine as liberated, it was not formed. With most printing papers, the yellow image appeared to give softer gradations than a black image of equal intensity in the high lights. Mr. Watkins thought the slight yellow stain, caused in the film by development with pyro, was quite distinct from the yellow image before referred to; it was to some extent removable by clearing agents, and was deposited on exposed and unexposed parts alike. He had found that long washing before fixing was a cause rather than a preventive, of this yellow stain. The gradations of the yellow image could not be accurately estimated by the shadow photometer, as used in the Hurter & Driffield system, and he thought that negatives developed to give the black silver image only would be best suited for determining the H. & D. numbers of plates.

Mr. J. SPILLER said that, the larger the quantity of alkali present in a pyro developer, the less was the tendency to stain. It was easy to remove the stain by washing with an alkali, and by treating a deeply stained pyro-developed negative with a solution of washing soda, he had completely changed its character, for it was rendered as transparent and steely as one developed with metol or eikonogen.

After some discussion,

Mr. H. SNOWDEN WARD read a paper on

DRY PLATES FOR RADIOGRAPHY,

detailing experiments with seventeen varieties of plates, the duration of the exposures varying from one to four minutes with a two to three-inch spark, development being by means of a standard ferrous-oxalate developer at 60° Fahr. With regard to the correspondence between light sensitiveness and X ray sensitiveness, it appeared that plates fairly sensitive to daylight were needed for radiography, but some curious observations were made; for instance, a plate which read about 130 H. & D. gave immensely better results than plates by the same makers reading 158 and 331. A plate specially prepared for radiography gave a very dense deposit of silver all over, even under a safety strip of copper and lead. Dr. Hesekiel had exposed a dry plate beneath a packet of a dozen sheets of bromide paper, obtaining good images alike on plate and papers, which seemed to suggest that speed would be increased in direct proportion to thickness of coating. Experiments with one make of plate confirmed this idea: but, with a different plate, the result was quite opposite, though this was probably due to an error on the part of the plate-maker with regard to the double coating. Soaking the plates in solutions of fluorescent salts tended rather to loss of sensitiveness than to increase of speed, and celluloid apparently had no advantage over glass as a support for the sensitive film. The results of a large series of tests were shown by means of tables of comparative readings, indicating, among other points, that, with a suitable film, increase of thickness was a decided advantage, and that the amount of silver present was an important factor.

In reply to questions, Mr. Ward gave some details as to the precautions taken in his experiments to ensure accuracy of result, and the meeting concluded with the passing of a vote of thanks to him, similar compliments having already been paid to Messrs. Wellington and Watkins.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 7.—Mr. A. L. Henderson in the chair.

The HON. SECRETARY had been going into the question of the effect of colour in the glass of which lenses are made at the present time. There were some rather yellowish-coloured glasses used in lenses now, and he thought they might have very material influence on the rapidity of these lenses. As a rough, but imperfect, test, he took five different lenses, and placed them upon a piece of printing-out paper in the shadow of a wall for about twenty minutes. The lenses included a Goerz, a Steinheil aplanat, a new single Zeiss lens, a Concentric, and one of Swift's, and were all at their full apertures. He passed round the print, with the images of varying intensities, remarking that he thought the subject worthy of further and a more critical investigation. His object was to test the absorption of different specimens of glass, so as to obtain some sort of factor.

The CHAIRMAN suggested, as an improvement, the removal of the lenses from their mounts, with the use of a ground-glass cover to counteract any chance interference by clouds, &c. He recollected an American exhibiting a number of examples of the effect of light upon glass which was considerable.

The HON. SECRETARY read a letter, received from the Gospel Oak Photographic Society, asking for the Association's co-operation in their protest against the so-called improvements being made by the London County Council on Hampstead Heath. He thought the London and Provincial should give their support in time to prevent its rural appearance being spoiled.

Mr. WELFORD agreed, and proposed that the Gospel Oak Photographic Society be informed that the London and Provincial accord their warmest support in preserving the beauties of the Heath, and asking in what manner their help would be appreciated.

Mr. FRESHWATER seconded the motion, and it was carried.

Mr. Freshwater gave a verbal description of Mr. Friese Greene's new apparatus for rapid photographic printing for book illustration, by which about 2000 prints per hour can be obtained.

THE AFFILIATION SCHEME.

The HON. SECRETARY, as one of the delegates of the Association to the Committee of the Affiliation of Photographic Societies with the Royal Photographic Society, read a report on the subject (see page).

Mr. W. D. WELFORD thought that, as the matter stood at present, the Royal Photographic Society left it to the societies themselves to suggest means of improving and carrying on the scheme, a work which should be done by itself, and which would then bring them the support required. He was of opinion that the Royal Photographic Society would not be at all sorry if the Affiliation was upset.

Mr. R. P. DRAGE inquired whether the Secretary had attempted to find out the views at present held by the Council of the Society in the matter. He considered it would be a pity for the Association, one of the original founders and supporters of the scheme, to be the first to wish to discontinue its support.

The HON. SECRETARY argued, however, that, if the Affiliation was likely to be of use, it should have made more headway during a trial of four years. The results of the first two years were, no doubt, fairly good; but since then it had got weaker and weaker, showing there was no more interest taken in the movement, and he was convinced that it had lost its utility and was on its last legs. The support of the Royal Photographic Society might have rendered its existence more productive, and, having stipulated for so much control in the management, it had neglected its duty sadly.

Mr. WELFORD said that the fact that it wanted so much control would show that the original intention of the Society was to support it as much as possible, but he agreed that it had failed to do so.

After further discussion, Mr. DRAGE proposed that the Association continue its support for one more year. This was seconded and put to the meeting, and was carried by seven to three.

PHOTOGRAPHIC CLUB.

MAY 6,—Mr. Isenthal in the chair.

It was pointed out that the statement in the minutes of a previous meeting, that Mr. Isenthal's Rhumkorff coil was actuated by a primary battery, was an error. Storage cells were used for the purpose. The two whole-plate negatives made at the X ray demonstration by Mr. Isenthal were passed round.

The SECRETARY read a note from Mr. Bedding, expressing his regret that he could not give his paper as arranged, and adding that he hoped to redeem his promise on some future occasion.

Mr. J. A. Sinclair passed round some carbon prints by Artigue's method. The characteristic feature of the prints, which were of great excellence, was a fine rendering of the half-tones, accompanied by considerable pluck and brilliancy. Mr. Sinclair's method is to sensitise the Artigue tissue in a two per cent. bichromate bath for two minutes; when dry (the drying does not take long), the tissue is ready for printing. This takes about the same length of time as does ordinary carbon tissue, but it is a characteristic feature of the process that there is no continuing action. Mr. Sinclair develops his prints by placing them in warm water at a temperature of 85° to 90° Fahr., until the image begins to appear as a silhouette. He then places the tissue in colder water, temperature of about 60°, and resorts to the sawdust-soup method of development. The sawdust is of the size of fine sand, and can be used over and over again. Mr. SINCLAIR stated that he now used the same sawdust soup as he had done when he began to work the process. By means of the sawdust and water the print can be locally developed. Generally speaking, prints made by this method yield more vigorous results than do either ordinary carbon or platinum.

A general discussion ensued upon the process, there being a consensus of opinion that the results were very fine indeed, and that the process would afford an opportunity for such as were skilful and careful workers rather than for such as desired a more simple method.

Mr. Nesbitt passed round a small album containing prints from the exposures he had made with an Eastman guinea camera in Paris at Eastertide.

The Club's special summer excursion was fixed for Saturday, June 27. Further particulars will be announced.

Mr. Child Bayley's paper on the 20th will be entitled *Photographic Societies and Photographic Art.*

Brixton and Clapham Camera Club.—May 5, Mr. J. W. Coade (President) in the chair.—A lantern lecture on

INDIA AND BURMA

was given by Dr. CUTHBERT WYMAN, of the Putney Photographic Society. This gentleman's slides were of exceptional interest, and gave one a vivid conception of that part of the globe in regard to its scenery, architecture, and native characteristics, the frequent applause evidencing the appreciation of a good thing by the audience. The subject for next meeting (May 19) is *Enlarged Paper Negatives*, and is by Mr. H. Stuart, of the North Middlesex Photographic Society.

Hackney Photographic Society.—May 5, Annual General Meeting.—The Society's balance-sheet and report showed a very satisfactory state of affairs. The members heard with regret that Mr. W. Fenton-Jones did not seek re-election to the office of Hon. Secretary, on account of pressure of business. However, no one being willing to take his place, he was persuaded to resume the duties for at least one year longer. Mr. H. Rose also sought retirement from the post of Hon. Lanternist, but he consented to act again *pro tem.* As a result of the election, the new Council is as follows:—*President:* Mr. Thomas Bedding, F.R.P.S.—*Council:* Messrs. L. S. Wilks, F. Gosling, W. Rawlings, F. Houghton, A. Barker, E. Puttock, Dr. Roland Smith, and Major C. Woolmer Williams.—*Hon. Lanternist:* Mr. A. Rose.—*Hon. Treasurer:* Mr. J. O. Grant.—*Hon. Secretary:* Mr. W. F. Fenton-Jones.—*Hon. Assistant Secretary:* Mr. A. D. Fort.—*Hon. Excursion Secretary and Curator:* Mr. A. Dean.

ON May 7, a very successful lecture and demonstration of the X rays was given by Mr. J. E. GREENHILL, at the Morley Hall, to a large audience. In the course of the lecture Mr. Greenhill took a number of radiographs of various objects, and the plates were developed, lantern slides reduced from the negatives by Dr. Roland Smith and Mr. Rawlings, and shown on the screen at the close of the lecture.

South London Photographic Society.—May 4, Mr. F. W. Edwards in the chair.—Mr. W. THOMAS, Chairman of the Affiliation Committee, gave an address on

PICTORIAL WORK WITH THE HAND CAMERA.

He said that hand-camera work had been despised and looked down upon by certain persons, but he himself believed that pictorial records could be obtained with the hand camera, and the best test of the sincerity of the belief was the practising of it. Misconception exists as to what are the necessary fixtures. The first is a good lens, of not too short a focus (five inches or five and a half inches) on a quarter-plate. The larger the available working aperture the better. He had one which could be used at 5·6, if necessary. Two fairly large finders will be found to be important features and have considerable bearing upon the results. They should include as much of the view as the lens does on the plate; if they include more, that portion should be stopped, but by the use of black paper or black varnish. The shutter should have means to vary the speed; the one he used (Thornton-Pickard) he considered too fast, as it could not be set at less than one-fifteenth of a second without setting it for time exposures. The use of plates or films is a mere detail of convenience. Mr. Thomas followed by making some remarks on the composition of pictures, illustrated by diagrams, and explained some of the rules underlying the composition of pictures which he brought with him. In answer to questions, it transpired that the lenses used by the lecturer were Wray's and Taylor, Taylor, & Hobson's, and his favourite plates were Lumière's Series A. In replying to the vote of thanks, he said the three important points he should like to leave behind were: (1) that it was advisable to strive for perfection in technique, and then to use it wisely; (2) mere material for subject is of minor importance, success in the treatment of it is the measure of success; and (3) in every pictorial effect very little detail is necessary. Mr. G. H. CRICKS showed and explained, on behalf of Messrs. W. H. Whittingham & Co., a large number of hand cameras. The arrangements for the three days' outing to the New Forest, at Whitsuntide, were discussed.

Carlisle and County Amateur Photographic Society.—The Eleventh Annual General Meeting of this Society was held in the Viaduct Hotel, Carlisle, on Wednesday, May 6. Mr. William Wright was voted to the chair, and there was a fair attendance. The Hon. Treasurer, Mr. John Robson, presented the financial statement for the year, which showed that over 15*l.* stood to the credit of the Society. The meetings of the winter session have been fairly well attended, and included lantern exhibitions of the following:—Set of slides by Mr. Paul Lange, prize slides, also an exhibition of members' slides at last ordinary meeting. A long and animated discussion ensued with reference to an extension of the Society's usefulness to the younger members, whereupon it was resolved—"That a room should be obtained for five winter months; that the Society should meet once a fortnight; that demonstrations of processes be given; and that there be papers and discussion upon photographic matters, in addition to the annual lantern meetings." It was decided that print and lantern-slide competitions be held amongst the members. The following gentlemen were elected office-bearers for 1896–7:—*President:* The Mayor of Carlisle.—*Vice-Presidents:* Messrs. R. Maclaren, M.P., and Warwick Hele.—*Committee:* Messrs. J. Beaty, J. Forsyth, R. M. Hill, W. Milburn, and W. Wright.—*Hon. Secretary:* Mr. J. S. Atkinson.—*Hon. Assistant Secretary:* Mr. Samuel W. B. Jack, 7, Petteril Bridge-terrace.

Edinburgh Photographic Society.—May 6.—The Edinburgh Photographic Society had under discussion

THE HAND CAMERA.

The subject was introduced by Mr. C. FRASER, and Mr. J. C. Oliphant, M.A., presided. Some fourteen kinds of hand cameras were shown by different members, the pocket Kodak being the smallest, and a half-plate camera the largest. Most of the members seemed to prefer plates for snap-shot work, but some of the best workers advocated the use of films, Mr. F. P. Moffat and Mr. James Patrick (Vice-Presidents) both speaking favourably of the latter. In speaking about films, Mr. PATRICK strongly deprecated the habit which some workers have of developing a large number at once. One at a time, he said, was all that could be undertaken if perfect results were hoped for. He mentioned the case of a gentleman who was in the habit of putting a number of films into a large dish of developer, and giving the whole an occasional stir with a stick. This worker *might* get one or two passable negatives out of the lot.

APRIL 13.—A joint meeting of the Royal Scottish Society of Arts with the Edinburgh Photographic Society was held in the hall of the former Society, in George-street, when Mr. F. E. IVES delivered his lecture on the

PHOTOCHROMOSCOPE.

There was a large audience, and the chair was occupied by Professor Armstrong, President of the Society of Arts. Mr. Ives was heartily thanked at the close of the lecture.

Photographic Society of Ireland.—May 8, Professor J. A. Scott (President) in the chair.—Subjects,

ODDS AND ENDS,

by Mr. J. H. GANE;

THE ZEISS AND TAYLOR LENSES,

by Professor SCOTT. *Odds and Ends* consisted in the demonstration of lantern slides, with description of various subjects taken during the season by Mr. J. H. Gane, and which comprised chiefly sea pictures and yachting studies, some of which were certainly of the highest order. Mr. Gane's works showed careful treatment, and were marked with a good deal of observation of subjects which lent themselves to pictorial effect. His efforts were received by the audience with merited applause. Professor Scott described very lucidly, and in an interesting way, a difficult subject for the popular taste. The Professor explained and showed by diagrams and various photographs the results produced by astigmatic lenses, and compared them with those done by the Goerz, the Zeiss, and the Cooke lenses, of which he gave lengthened descriptions of their structure, and showed the degree of freedom from astigmatic defects. He thought the Cooke lens, while producing results equal to the foreign makers, had the advantage of being very much less costly. At the conclusion of the evening, a test was made with the oxyhydrogen light against the oxyl-ether jet; the former proved the brighter of the two, while the latter was a quieter light, colder in colour and less hurtful to the eyes.

Patent News.

THE following applications for Patents were made between April 29 and May 6, 1896:—

FRAMES.—No. 8804. "Improvements in and relating to Frames for Holding and Displaying Photographs and the like." R. B. MILLER.

COLOUR PHOTOGRAPHY.—No. 8865. "Improvements in Colour Photographs and Apparatuse for use therein." B. J. EDWARDS.

VIEW-FINDER.—No. 9139. "An Improved Photographic View-finder." S. J. LEVI and A. J. JONES.

HAND CAMERAS.—No. 9309. "Improvements in Hand Cameras." S. HEBBLEWHITE.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

REPRODUCTION OF DIFFRACTION GRATINGS.

To the EDITORS.

GENTLEMEN,—From the report of the Camera Club Conference, I see that the discussion of the difficulty that I had met with in removing the turpentine after development of a bitumen grating has obscured the fact that I have done many successful copies (one was handed round) by this process, with one not only much more brilliant than the original, but brighter than copies by any other process. The difficulty referred to is serious only when the development is pushed. Otherwise the turpentine can be removed without trouble, either by washing with water or by centrifugal force.—I am, yours, &c.,

RAYLEIGH.

10, *Downing-street, Whitehall, S.W., May* 6, 1896.

FINDERS.

To the EDITORS.

GENTLEMEN,—I read with some surprise, in your issue of April 17, that a patent has been taken out by Mr. G. F. Fraas for view-finders consisting of a variety of combinations of prisms and lenses, or of plane and curved surfaces in prisms. I do not see how a combination of an ordinary lens and a prism would have any advantage over a lens with an inclined mirror, and it would be much more expensive; but the combination of curved and plane surfaces in a prism has been used for finders in our hand cameras for some time, our first finders of that sort having been made something like two years ago. We have now on hand, in various stages of manufacture, more than a thousand finders, consisting of prisms with one face formed into a convex lens; and, although we no longer use them in our hand cameras, for the reason that the variation of the image in the finder with the position of the head makes it difficult to arrange the picture accurately with them, we certainly do not propose to abandon our

prior rights in connexion with them. Besides the prisms with convex surface, we have experimented with a prism with concave surface, which also makes a brilliant finder, with some curious properties.—I am, yours, &c.,

T. M. Clark, *Treasurer.*

The Technical Company, 22, Congress-street, Boston, April 28, 1896.

ASSISTANTS AND THEIR GRIEVANCES.

To the Editors.

Gentlemen,—With reference to previous correspondence concerning assistants and their grievances, it seems that operators and assistants, &c., have grown stronger on the subject of a union; innumerable schemes have been put forth with a view to improving their lot, but little reform has been effected. The reason for these repeated failures is not far to seek. Many assistants have failed to grasp the important fact that a union is necessary, and, until they do, it will be impossible to do away with existing grievances.

Of the many letters which I have read in the Journal, not one has a word to say concerning the treatment meted out to the reception-room young ladies, employed by a firm of cheap photographers (this firm is, I should say, indicated by a retoucher of thirty years' standing), who suffer under the same grievances as the operators and retouchers; receive 12*s.* per week, for which they work from 9 till 8, with hardly any time for meals. They also work on all bank holidays, and are bullied should they not "table sitters" well. Should the takings, at the end of the day, be short, they are required to make up the same out of their hard-earned wages.

At one studio where I was retouching, a parcel was delivered, addressed to the head of the firm, with 1*l.* to pay. The money was paid, and, when the head arrived and opened the parcel, it was found to contain a brick. The operator, a "mere lad," was bullied and told he would have to refund the sovereign, which he did. This operator was receiving 25*s.* per week. The majority of assistants employed by this firm are mere puppets in the hands of the head of the firm. In other firms, assistants work in the most friendly and cordial relations. Why not in this firm? It is also a well-known fact that they work their hands till illness overtake them, and are compelled to lay up, when they are stopped for same.

With regard to the Union, I am afraid it will be rather uphill work to get together 20*l.* the sum suggested by Mr. Randall to start a Union with, unless some kind friend comes forward with that amount. I have not the least doubt that once a Union is started it would be a great success; but, failing this, I hasten to join in the excellent suggestion made by Mr. Randall, that assistants should join the Shop Assistants' Union, when they could, by every legitimate means, endeavour to secure that justice which hitherto has been denied them.

I would commend to all workers, specially those employed by this sweating firm, of which so much has been heard of late, to the above Union, whose objects seem to cover all their grievances. The subscription is small, and it now remains for all workers to join in large numbers.

I am sure the best thanks are due to Mr. Randall, who has so eloquently pleaded their cause in the correspondence columns of the Journal, and who is now devoting himself to the redressing of their grievances, and to this end he should secure the co-operation of all workers in this profession.

One word in conclusion. All *employés* of the cheap firm must have hailed with intense satisfaction the letters which you have so kindly published from time, and I thank you most sincerely and cordially for the assistance you have always given to operators and assistants generally to make known their grievances.—I am, yours, &c.,

J. W.

London, May 9, 1896.

To the Editors.

Gentlemen,—Since my letter which appeared in a recent number of the Journal, I have received a communication from the friends of "L. C.," putting me in possession of the facts of the case and the identity of her employer. After considering these particulars, I am surprised at the mildness and the moderation of language with which Julia Dawson stated the case of "L. C." in the *Clarion.*

I believe it would not be possible to find in our industrial system another instance of such abuse of power, of absolutely unnecessary interference with *employés* by meddlesome regulations, of grinding down of wages, forcing the recipients to the verge of crime, of unhealthy and unsanitary conditions, of total want of consideration, of delight in inflicting pain upon *employés* out of mere wantonness, of a spirit of vindictiveness and of a spitefulness which passes belief. Harsh treatment and sharp practices might be expected from an employer engaged in running a business which depends on cutting prices, and who makes his profits out of the ruin and bankruptcy of his fellow-employers; but, in this case, even this extenuating circumstance is wanting.

"L. C." is employed by a leading lady photographer, who charges for her work a sum nearer three guineas than five shillings a dozen. Her patrons come from amongst the wealthiest and the highest in the land, her praises are sung by many fashionable journals, and her work is reproduced week by week in the pages of the leading illustrated papers. This lady, when not otherwise engaged, occupies her time in interviewing journalists, airing her views on the emancipation of women, and informing all and sundry about the two and three guineas per week she is paying in wages to the women who are fortunate enough to be in her employ. This, however, is only her fun; these fabulous wages are purely mythical; the plain matter of fact is she pays none more than a pound, and out of very many spotters the average pay is a paltry 12*s.* per week.

Can any one come forward and assert that 12*s.* per week is a living wage? Every one knows perfectly well it is not a living, but a starvation, wage. A good spotter is worth at the least 15*s.* per week, and only last week an advertisement appeared in this Journal offering 16*s.* per week for a spotter, and that *to commence!* It would be idle to urge that these girls are incompetent, and not worth more than they receive, because I know for a fact that they would not be in the place a single day if they were not up to their work.

Three shillings per week added to the wages of these girls would mean an enormous difference to them, yet, for a miserable 3*l.* 15*s.* out of a weekly profit of 100*l.*, this model employer, who is supposed to be doing so much for her sex, does not hesitate to inflict a starvation wage, and the consequent intolerable suffering upon her less fortunate sisters who are within her power. She also adds insult to injury by loudly proclaiming to the world what large salaries she pays to her *employés*, creating the impression that a spotter in her establishment receives a larger salary than an operator in the studios of the common or garden photographer.

Insult and cruelty are much harder to bear than low wages, and in the case of "L. C.," as in nearly all cases of dissatisfaction, the former and not the latter is the primary source of complaint. The rule against talking, which is here enforced, is as stupid as it is overdone. Surely it would not be very difficult to draw the line between incessant chattering and absolute silence. Other employers can do it, and why not the employer of "L. C.?"

This "system of slavery," to quote the fearless Julia Dawson, cannot possibly last if a business is to prosper. The employer who is the enemy of his workpeople will find, sooner or later, that it is a policy that fails, even from a commercial point of view, and carries with it the elements of its own destruction. Unfortunately, the actions of an individual reflect upon the whole profession, and I trust photographers, for the credit of their craft, will come forward and give an emphatic declaration that these actions do not receive their approval.—I am, yours, &c.,

18, *Canbury Park-road, Kingston-on-Thames.* John A. Randall.

To the Editors.

Gentlemen,—My attention has been directed to a letter by John A. Randall, which appeared in your last issue, advocating the formation of a Union of Photographic Assistants or the alternative of joining the Shop Assistants' Union.

My personal opinion is decidedly in favour of "fewer unions and more union," and, seeing that, as Mr. Randall says, the objects of a Photographic Assistants' Union would be precisely the same as ours, I certainly would advise the photographic assistants to join the National Union of Shop Assistants, Warehousemen, and Clerks, and strengthen an organization that has now got over the inevitable initial difficulties in connexion with the formation of every union.

We are now in a position to assist in paying the expenses in connexion with the formation of branches, and will be glad to communicate with any assistant desirous of seeing a branch started where there is a reasonable chance of success. I will be glad to forward a copy of our rules on application, and give any other information I can.—I am, yours, &c.,

Jas. Macpherson, *General Secretary.*

National Union of Shop Assistants, Warehousemen, and Clerks, Head Office, 55 and 56, Chancery-lane, London, W.C.

THE BRADFORD PHOTOGRAPHIC SOCIETY.

To the Editors.

Gentlemen,—It grieves me to see that you have allowed your columns to become the medium of a slur being cast upon certain members of the above Society, who have done their level best to further its interests. Nobody but those closely connected with the same know to what a great extent jealousy, back-biting, and other evils have been carried on; the proceedings have been a disgrace to the Club.

A certain clique, by some means or other, got into office last year, and attempted to use the Society as a means of pushing their goods, and this year a change was planned by the so-called "opposition party" (who are real amateurs). The consequence was, the trade was thrown out, much to the disgust of the clique to which your last week's correspondent belongs. The same person reported in the local press only those reports that suited him, and, when one of the officials "with whom the Secretary cannot work in harmony" won a prize, it was, of course, not recorded; but when another prominent member wrote one, and sent it to a contemporary, he was called all the names not to be found in the Prayer-book. Another member nearly lost his position through an interfering official telling his employer that he called him (his employer, "the

boss," and numerous other mis-statements. In short, he (the *employé*) will never again be trusted. Another official (a professional) once treated an amateur demonstrator, who was giving his fellow-workers an insight into the mysteries of carbon, in a most unpleasant manner by "cornering" and other ungentlemanly exclamations.

I write this in the hope that, out of common fairness, you will give the "other side" a hearing, and not let your readers go away with the idea your last issue would give.—I am, yours, &c.,

A Disgusted Committeeman.

THE LILLE (FRANCE) EXHIBITION.

To the Editors.

Gentlemen,—Kindly permit me to call the attention of British exhibitors to the above, for which I can now supply entry forms and all information. Only works of artistic merit will be accepted, and they have to pass a Selection Committee, composed of five artist painters and two photographers. There are no awards, but each accepted exhibitor will receive a commemorative plaque or medal, engraved by M. Edgar Bonbry, Director of the School of Arts, Lille. Entry forms, duly filled up and signed, must reach me on or before June 1, and the frames on or before June 10. The frames can be sent to my office, from whence they will be dispatched in a joint case or cases, and the carriage to Lille and back will be equitably proportioned. I do not, however, accept any responsibility beyond making the necessary arrangements and endeavouring to get them carried out. Exhibitors at Harlem and Paris can have their work sent on to Lille.—I am, yours, &c., Walter D. Welford.

"Photographic Review" Office, 15, Farringdon-avenue, London. E.C.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

Photographs Registered:—

E. S. Baker, 82, Bristol-street, Birmingham.—*Photograph of Aston Villa Football Club, League Champions, 1895-6.*

Alfred Ernest Harris, 44, Partridge-road, Roath, Cardiff.—*Photograph of a Mosaic of Photographs, viz., Waterfalls, Hotel, and a Portrait.*

"Cloudy;" Albert; W. R. F.; Alfred Freke; W. H. Hill, and others.—Received. In our next.

Metric Formulæ.—J. Liddy. Thanks; closer inspection will show you that it was a misprint.

Colour of Negative and its Effect in Printing.—Formula. The subject referred to was probably a discussion at the Photographic Club. If so, it will be found on page 236 of the current volume.

J. E. G. (Venice)—A somewhat difficult question to answer, but we have had the most favourable experience of Adams's and Newman & Guardia's changing backs. Shall be glad to assist you further if we can.

Photograph of Edison.—Charles Wilcox writes: "Is it possible to get a photograph in London of Mr. Edison, the inventor? Silver print preferred."—Inquire of Mr. Spooner, Strand; Messrs. Marion, Soho-square; Messrs. Mansell, Oxford-street, W.

Stains on Cloth.—A. E. Lane. Unless we knew the composition of the dye, which you have not stated, it is, of course, impossible to say what will remove the stains. Probably, however, whatever would remove the stains would also alter the colour of the cloth where the stains were.

Coarseness of Grain in Negatives.—T. Hendy. The coarseness of the grain is due to the emulsion, and not to the method of development. Some very rapid plates, such as those you have evidently been using, have a very coarse grain. As a rule, the slower plates are the finer is the grain.

Spotting Colour.—W. R. H. asks: "Can you advise me where to get a spotting colour for enamelled pictures, as the ordinary spotting colour comes off during enamelling?"—Colours for the purpose are supplied by most photographic dealers. If yours does not supply them, you can get them from Mr. Rudowsky, Guildhall-chambers, E.C.

Right to Photograph.—C. W. E. says: "There is to be a flower show and *fête* in our neighbourhood at Whitsuntide, to be held in a private park. The admission will be 1*s.* I applied to the Secretary for permission to photograph in the grounds on the day, and especially a ceremony that is to take place. He said the Committee had, for a consideration to the charity, sold the right to another photographer. Can you tell me if I pay my shilling, and another for my assistant, for admission, they can legally prevent me from taking such negatives as I choose?"—Yes, certainly, as the grounds are private property.

Enamelling Silver Prints.—T. Mathias. The cause of the collodion becoming ropy, and flowing with difficulty, after a few plates have been coated, is the evaporation of the solvents. The collodion should be thinned with ether and alcohol—say, five parts of the former to one of the latter, as the ether evaporates more quickly than the spirit.

Enlarging.—Enlarger. 1. Cover the window with one or more thicknesses of ground glass, according to the strength of the sunlight. 2. Yes, certainly, if the optical arrangements are good, as they are in the various apparatus supplied specially for the work. 3. You had better use the formula recommended by the makers of the paper you employ. What would be the best developer for one brand of bromide paper is not necessarily the best for any other.

Studio and Building Laws.—Stopped. See reply to "S. W. B." If the Town Council have served you with notice to pull down the studio, we can only assume it is within its right in doing so. Of course, you can fight the matter out in a court of law; but that will cause delay, and involve some expense if you gain, and very much more if you lose. Would it not be better to modify the structure so as to conform to the requirements of the authorities, which do not seem very much, after all, and thus save time (and the season is advancing) and cost?

Studio.—S. W. B. The design for studio shown in sketch B will be the best in every respect. Also the dimensions are good. The other part of your letter is not so easy to answer, because so much depends upon the by-laws of the district in which you reside. We may say, however, if it were in the metropolis, the building would not be allowed to be put up, of the materials proposed, in such close proximity to the house. Our suggestion is that you submit plans to the town authorities, and get their approval, before commencing the erection.

Bromide Prints for Platinum.—C. and C. S. write: "We know for a fact that a photographer here is regularly supplying his customers with bromide paper prints as platinotypes, and for which he is charging fifty per cent. extra over silver prints for them. This I can prove, as we have just engaged as a printer the man who, for the last two years, has made them, and he tells us that platinum printing has never been done in the place."—This is no uncommon thing, though it is a fraud on the customers, and can be punished as such. Any one so defrauded can institute proceedings against the photographer, and, if one does, we shall be pleased to receive a report of the case for publication.

Photo-micrography.—Laboro asks:—"Will you kindly inform me the best work on photo-micrography, English or German? I have a whole-plate long-extension camera and rapid symmetrical lens (Ross's). Could I use these for microscopic work? What would be the best microscope? The best work on mounting microscopical specimens (pathological)?"—The most modern work and best is that by Andrew Pringle, published by Iliffe & Co. The whole-plate camera may be utilised; but, if the lens be a whole-plate one, it will not be suitable. Any good microscope will answer. We know of no work specially devoted to mounting pathological specimens. In Mr. Pringle's work will be found much that is useful on the subject.

Wet-plate Bath for Printing.—Printer writes: "Kindly inform me the best way to prepare an old wet-plate bath for sensitising albumen paper (to get rid of the iodine). Does boiling down till fusion takes place get rid of all foreign matter?"—Add to the bath a solution of citric acid, say, two drachms of a thirty-grain solution to each quart of bath, then add liquor ammoniæ till the blue colour of litmus paper is restored. Filter and acidify with nitric acid. If the solution be then made up to the requisite strength with fresh nitrate of silver, it may be used direct. If the bath be evaporated and the nitrate fused, the whole of the iodide will not be got rid of, but what remains will do no harm. We have often strengthened up a collodion bath, and used it without further treatment, and found no trouble.

Commencing Business. — Studio says: "I must ask you to pardon my troubling, but I should be so very much obliged if you would give me your valuable advice on the following question: I am at present employed by a firm, but I find that the long hours and worry are simply ruining my health. I have saved about 60*l.*, and thought I should open a studio for myself. I am thoroughly experienced in every branch, including operating. Do you think I have sufficient to start with in a humble way? and would you advise me as to the best district?"—In reply: We cannot advise our correspondent to start in business with such a small capital: at least double or treble would be necessary. Possibly the money would be best utilised by enabling our correspondent to take a more suitable situation and purchase a small share of the business.

Toning Difficulty.—Scotia writes: "I am a user of Ilford P.O.P. (mauve) to a considerable extent, and of late have had the same experience in discolouration as your correspondent, 'W. K. S.' I am a careful and clean worker, and am at a loss to account for it. The prints are all right when toned, and continue so if put into the hypo within, say, ten minutes after toning, but, if washed longer, begin to turn a nasty, dirty yellow colour, which increases in intensity the longer they are washed. This colour appears on both back and front of the print. The prints are washed in running water, and are not allowed to clog, and all hypo is carefully kept out of the way. I enclose print, which was toned to an ordinary purple-brown, and which assumed the black tone in the washing. I repeat that it was washed in running water, and carefully turned about, and, being in one of the first toning batches, was washing after toning quite half an hour. If it had been put into the hypo within ten minutes after toning, it would have undoubtedly been all right, which the prints in the last batch were."—The print enclosed seems to be different from that of our previous correspondent in appearance. It has all the appearance of having been exposed to a feeble actinic light during the half hour it was washing.

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EX CATHEDRÂ.

There appears at present to be very little hope of a reform in our somewhat unsatisfactory patent system. In the House of Commons recently, in reply to Sir J. Leng (Dundee), who asked a question with reference to the suggestion of Lord Justice Kay that a comptroller of patents should be appointed to deal with prior specifications and applications for patents, Mr. Ritchie said: "I am not prepared to propose the alteration of the existing practice. The subject is a thorny one, and has engaged the attention of Parliament and of the public on and off for many years. 25,053 patents were applied for in 1895, and an enormous staff would be required if the obligation of deciding on the novelty of each application was imposed on the Patent Office. I must further remind the hon. Member that the most eminent authorities differ occasionally as to whether an invention is new."

* * *

Mr. Ritchie, or his advisers, probably exaggerated the difficulties of the substitution, for the present hap-hazard patent regulations, of a method whereby official and indubitable recognition of the validity of granted patents was dispensed, as is the case in the United States and Germany. Of course, the trouble of the department would be vastly increased, and the fees would, no doubt, be calculated on a much higher scale; but the gain to invention and industry would clearly be very great by the change. But our present patent laws bring in a large profit to the department, and furnish the lawyers with plenty of work, and these reasons, in the official mind, are, we suppose, quite sufficient to justify the perpetuation of a defective system.

* * *

Under the reform suggested by Lord Justice Kay we should expect to witness a check placed on dishonesty, and a fillip given to the cultivation of genuinely inventive ideas. If we may argue upon the evidence with which photography supplies us, under a reformed system, with a staff of examining experts at the Patent Office, perhaps not a fifth of the 25,000 applications for patents annually made to the English Office would, on the face of them, be entertained. Scarcely a week passes but what provisional protection is granted for ideas which a most superficial acquaintance with photographic history demonstrates to be, as the phrase runs, "as old as the hills." The Patent Office virtually takes inventors' money without giving value in return, a practice in which Mr. Ritchie is not prepared to propose any alteration!

* * *

Some of our readers may, perhaps, be able to furnish a correspondent with a remedy for a skin trouble, which is caused in the following manner: Whenever he touches the hypo solution with his hand, small blisters appear upon his fingers; they break and remain sore for several days, causing great irritation, besides keeping him (he is a professional photographer) from fixing operations until they are healed. We are not aware of having before heard or read of our old friend "hypo" coming under suspicion in this disagreeable manner.

* * *

Are gelatine dry plates fluorescent? If they are, then a new and valuable light is possibly thrown on the photographic phenomena of what we are still justified in calling the X rays. Mr. W. J. Wilson, of the Paget Prize Plate Company, has been good enough to hand us a number of communications to his Company from Mr. W. J. D. Walker, of Boyne Mill, Drogheda, who has found that the Paget XXXXX plates are markedly fluorescent under the X rays. Coins in a box and the bones of a hand were distinctly visible when a plate was substituted for the fluorescent screen for visual examination. It is

suggested that this phenomenon of the fluorescence of a dry plate accounts for the photographic action of the X rays. Probably, as Mr. Walker suggests, any good, thickly coated plate, rich in silver, will fluoresce, so that his experiment is open to the verification of our readers. A dry plate would form an exceedingly cheap substitute for a fluorescent screen. An interesting letter on the subject, from Mr. Walker, appears in our Correspondence columns.

* * *

THE management of that popular place of entertainment, the Alhambra, have recently included in their programme a series of lantern-slide views of Buluwayo, and portraits of Matabele warriors, members of the defending force, and prominent Chartered Company officials. With remarkable unanimity the daily and weekly press characterise the Exhibition as poor and unsuited to the taste of variety-theatre audiences. Curious to ascertain for ourselves whether the press verdict was at all warranted by the quality of the slides, we recently took occasion to inspect them, and for once in a way were forced to agree with our lay *confrères*. We have seldom seen publicly exhibited such crude and depressing productions of the camera. In future, those who contemplate utilising photographs for entertainment purposes would do well to avail themselves of qualified advice in their selection. On the other hand, the projected photographs of animated scenes still appear to give great delight to the audiences.

* * *

A PHOTOGRAPHIC outing, of a somewhat unique character, is to be held from to-day (Friday) till Tuesday next. The Photographic Field Club, which was formed in 1860, has arranged for a visit to Ludlow, under the leadership of Mr. H. P. Robinson and Colonel Gale. We wish the party fine weather to enjoy the natural attractions of the beautiful Shropshire town. That an association, formed thirty-six years ago for the prosecution of photography as an outdoor pursuit should still be leading an active existence is a phenomenon which encourages us to hope that field photography will always be popular with thorough-going workers. Ludlow is a long way from London, and we are challenged to point to any *young* enthusiasts to compete with the Field Club veterans. We reply: Was there not a Convention excursion to Ludlow last year? and is there not a Convention meeting at Leeds this?

* * *

MR. JOHN CARBUTT, the well-known plate-maker of Wayne-junction, Philadelphia, sends us a copy of the Philadelphia *Public Ledger*, which contains an account of some interesting experiments with the X rays undertaken by Dr. Arthur W. Goodspeed, of the University of Pennsylvania. This enthusiastic student of science made himself the subject of the experiment. Taking a Carbutt X ray plate, sixteen by twenty inches in size, he placed it flat on a table, and then lay down upon it. The plate was just large enough to go between his shoulders. The tube was placed over the body at a distance of two feet from the plate. The current was turned on, and an exposure of forty-five minutes was made. Our contemporary gives a reproduction of the radiograph of the upper portion of Dr. Goodspeed's skeleton.

PHOTOGRAPHERS AND THE RAILWAY COMPANIES.

THE question of reduced railway fares to photographers is one that has often engaged the attention of photographic societies, though, unfortunately, with but one result. The first society to take the matter vigorously in hand was, if we remember rightly, the West London, soon after its formation; the last, the Hackney Society; but all to no effect. A petition to the companies to the same effect is now being circulated, and we heartily wish it every success, and we can assure our readers that, if it is, we shall be amongst the first to avail ourselves of any reductions that may be made.

There are generally two sides to every question, and there are to this—the photographers and the railway companies—and, as we mentioned a few weeks back, there were probably good reasons why the same privilege as anglers enjoyed over limited districts, at certain seasons, should not be accorded to photographers, over unlimited ones, at all times. The various railway companies have, at different times, duly considered the matter, and we are given to understand that the principal objection has been that the privilege would not be availed of for strictly photographic purposes only; and probably they have some ground for this. We have even heard of persons joining angling societies only for the advantage of cheaper railway fares, and probably the companies are not ignorant of the fact, therefore they are not altogether unreasonable in suspecting that a similar thing might happen if members of photographic societies were put on the same, and extended, footing as anglers, particularly as they know they are daily being defrauded by unscrupulous travellers. Of course, every one knows that no respectable member of a photographic society would use his privilege, if granted, improperly.

Let us look at the matter from a strictly railway company's point of view, not as counsel, but, as it is well to do so, in the case of any more petitions being presented, so that such objections as may be raised against them may possibly be met. It must be borne in mind that there are some three hundred photographic societies in the United Kingdom, averaging, say fifty members each—some have less, and others many more. The subscriptions vary from a few shillings a year upward, some being as low as half-a-crown. This means that 15,000 people ask for the privilege of travelling at reduced fares if accompanied by photographic apparatus. Now, a hand camera can be had so portable as to go into the pocket, or some for so low a price as a few shillings; hence any member of a "Little Pedlington" Society in existence, or to be formed, for the annual subscription of half-a-crown, and the outlay of a few shillings for a hand camera, would have the right to travel where he listeth at a reduced fare.

It was remarked to us some time ago by a railway director, when this subject was then to the fore, that, if the privilege was given to photographers, why not to footballers, cricketers, golfers, or other outdoor pleasure-seekers, as one of the reasons why the privilege should be granted is that the photographer only travels for pleasure and not for profit? This argument is somewhat on a par with that of the correspondent who wrote a year or two back that amateurs should be supplied with their materials on better terms than professionals because they made no profit by their use. It must be borne in mind that the major portion of railway travelling is not for strictly business purposes, and railway directors are fully aware of that.

Railway managers are business people, and business and sentiment do not go always hand in hand. It is the former that they consider first in the interest of the shareholders' dividends. What should be done to secure the desired reduction of fares to photographers is to convince the managers either that the present rate compels them to reach their

destinations by other conveyances, to their loss, or that, by reducing the fares, they would carry larger numbers of passengers, and in such an increased proportion as to compensate, or more, for the reduction in the fares; also, at the same time, show some guarantee that the privilege, if given, would not be abused by its being used for other than strictly photographic purposes. When this can be done to the satisfaction of the companies, we feel sure that what we all desire will be accorded without any largely signed petitions, humble or otherwise.

Another Amusing Query.—It will be remembered that a few weeks back we quoted from one of the evening papers an amusing query about photography, and the not less amusing reply it evoked. Here is another photographic query that has since appeared in the same paper:—

"(31,067) PINHOLE PHOTOGRAPHY.—I shall be obliged for recipes for sensitising, developing, and fixing.—*Au Naturel.*"

Value of Pictures.—We have frequently referred to the high prices paintings by the old masters, at times make, and the abnormally low ones they are sometimes disposed of at auction in this country. At a sale in Paris, one day last week, a painting, *Diane au Bain*, by Watteau, was knocked down for 107,000 fr., equal to about £4280 English. The purchaser is said to be the Comtesse de Miranda—better known by her professional name, Mdme. Christine Nilsson. Clearly England is not the only country in which good pictures realise high prices.

Acetylene in Use.—It is stated that acetylene is being tried in some of the tram cars in Paris, and with promising success. The generator, containing the calcium carbide and water, weighs under thirty pounds, and is placed beneath the steps of the vehicle, and it contains sufficient material for generating thirty-five feet of gas. As the lighting power of acetylene gas is something like fifteen times that of coal gas, the cost is stated to be less than that of illuminating the cars by petroleum. Doubtless, after this, we shall have a practical and safe application of acetylene for lantern purposes next season.

A Proposed New Society.—*Apropos* of the article in a recent number, on *Photographic Societies and their Future Prospects*, a correspondent sends us a cutting from a suburban paper—an editorial paragraph. It is as follows:—

"We are glad to note that a movement is on foot for the establishment of a photographic society in Chiswick. There should be plenty of room for such an institution. To put it mildly, there are not too many societies in the district for the promotion of friendly intercourse, and an addition to their number is a healthy sign. The multiplication of institutions of this kind will do much to break down the spirit of cliquism which is characteristic of suburban districts."

But for the last sentence, we should have surmised that the writer was unaware of the existence of the West London Photographic Society, or that it held its meetings in Chiswick. We have, however, heard rumours of dissensions in the Society, and possibly the proposal of a new one may have something to do with them. The West London is a strong Society, and one that has done good work; as such, we hope it will continue. We can only reiterate what we have said before, namely, that one strong society is better than half a dozen small ones in a district.

Photography at the National Gallery.—The communication, in our last issue, from the Rev. F. C. Lambert, commenting on our article on Amateur Photographers and the Trustees of the National Gallery, is one that will not, we fear, be likely to cause the latter body to alter its decision. Indeed, some of the points raised appear rather to sustain it than otherwise. The Rev. gentleman suggests, with reference to the Trustees recognising the importance of the work being done well, "that an enthusiastic amateur who would not mind trying two or three times the same picture *might* get quite as good results as a professional who is neither able, nor willing to give so much time to the work." Now, supposing the amateur did, after several attempts, get a good result, of what advantage would it be to any one but himself? This is what the Trustees, no doubt, have in mind, and they, in their discretion also, we believe, limit the privilege of photographing the pictures to such professionals as they are assured understand their work, and are capable of producing the best results, and thus without having to make several attempts to obtain them.

It must not be assumed, as some have done, that permission to photograph the national pictures is given broadcast to every professional that likes to apply. Mr. Lambert refers to the amateur "who is a duffer, who spends hours and pounds and produces only ghostly smudges." Still, he is an amateur photographer, and would have an equal right to practise on the national pictures as the most proficient, if amateurs had the right at all. The Trustees cannot be expected to examine applicants as to their proficiency, and where is the "duffer" that considers himself one? Mr. Lambert also alludes to the "capable and enthusiastic amateur who is willing to devote his abilities, time, and money to the furtherance of reproducing and popularising the great art treasures of the nation." It is a little difficult to conceive how the amateur could popularise the works, except by publication; then he would cease to be an amateur, and would be doing only what has already been done by the most skilful art reproducers and publishers in the world. If the Trustees relax the restrictions as to photographing the National pictures, it would, we suspect, be on stronger arguments than those yet brought forward in the interests of amateur photographers. Still, there is no reason why they should not be advanced.

Substitute for Diamond for Cutting Glass.—The time-honoured glazier's diamond seems in danger of being displaced by a cheaper substitute, even more efficient than the original instrument. It is reported that M. Moissan has discovered a means of forming a compound of boron and carbon by heating boracic acid and carbon in an electric furnace, the intense heat of which has already been the means of introducing into every-day use substances that hitherto were either unattainable or too costly. The new substance in appearance is black, something like zoophite; and its hardness is so great as to enable it to cut diamonds with ease. Unlike the results of previous experiments in artificial-diamond making, which were in minute particles, the new cutting material can be produced in pieces of any size required.

A Photographic Transit Circle.—Dr. H. C. Russel has recently devised a method which has solved a problem long wanting solution—a method of utilising photography for registering the transit of stars. It is claimed for it that it is equally good with faint stars as with those of higher magnitudes, and that it is capable of far greater exactitude than even the best of existing instruments. It consists mainly of a photographic and visual telescope—the former being thirteen inches in diameter—mounted together, and so arranged that it could be reversed in the polar axis and two images thrown on the plate. If they coincided, it would show that there are no errors of collimation due to flexure of the instrument, while, if a double image was produced, a point between the two star spots on the plate might be assumed to be the mean of errors.

Eclipse Photographs.—In view of the near approach of the next solar eclipse, much interest attaches to the *Report and Discussion of the Observations on Solar Physics*, recently presented to the Royal Society by Mr. Norman Lockyer. Messrs. Fowler and Shackleton's reports on the 1893 eclipse as observed in West Africa and Brazil were fully treated, and the general conclusions given under nineteen heads. It is noticeable that a certain effect, the pro-

duction of a line D_3, as shown in the 1883 eclipse photographs (*see* paragraph 9), is now supposed to have been caused by a photographic effect due to the unequal sensitiveness of the isochromatic plate employed. The last paragraph (19) is interesting as bearing on chemical theory, it atrengthens the view that chemical substances are dissociated at a temperature so intense as that of the solar orb.

The Universality of Photography.—No better object-lesson on the immense value of photography in connexion with physical science could possibly be found than that afforded by the recent *conversazione* of the Royal Society. Objects of interest, on both natural and physical science, were shown, but the latter were predominant and attracted most attention; the novelty of Röntgen work not having worn off, the exhibits in connexion with it naturally attracted a great share of the visitors' attention.

Some of the Photographic Exhibits.—Of Röntgen rays and their action there were several demonstrations. Mr. Herbert Jackson showed how superior to all other substances was potassium platino-cyanide as a phosphorescent screen. It is a remarkable thing that, for many months before Röntgen hit upon the idea of utilising it photographically, Mr. Jackson should have been working with it, and have devised a form of Crookes' tube that at the present time holds the lead against all others.

Mr. Sydney Rowland exhibited electro-sciographs of a large variety of objects, mainly of surgical interest. About fifty examples were shown. They consisted of about twenty per cent. of sciographs of foreign objects, fifteen per cent. of diseased bones and joints, ten per cent. of bone deformations through tuberculosis, and a variety of other deformities of terminal bones and joints.

Mr. Friese Greene's apparatus for producing photographs at the rate of two or three thousand an hour for periodical illustration was shown, and attracted much attention.

Mr. J. Norman Lockyer, C.B., F.R.S., exhibited a glass prism of nine inches' aperture, constructed by the Brothers Henry, of the Paris Observatory, for the purpose of photographing stellar spectra. The construction of a prism would seem a simple enough matter, but the very highest degree of skill is needed to produce them so as to perform satisfactorily. A reflecting prism, for example, of a very few inches' diameter, could not be bought for a hundred pounds. The same exhibitor showed a variety of photographs, coronal spectral rings, spectra of stars, spectra of helium and gas in reference to the spectra of Orion stars, spectra of metals of the iron group, &c.

Mr. F. McClean, F.R.S., and Professor Hartley, F.R.S., also showed an interesting variety of photographed spectra, celestial and terrestrial.

Professor Worthington, F.R.S., and Mr. R. S. Cole exhibited photographs of splashes, of falling drops, and other bodies dropped into liquids. Photographers often speak of "instantaneous" work, but rarely is the title so justified as in the case of the splash pictures, for the exposure was about three one-millionths of a second.

Captain Abney, C.B., F.R.S., exhibited his apparatus, showing how to throw on a screen, or photograph on a plate, the image of a luminous object in monochromatic light.

Mr. Ives's stereoscopic photo-chromoscope was also a centre of attraction.

Shorn of all these objects of photographic interest, the *conversazione* would have been in comparison very commonplace and ordinary.

FOREIGN NEWS AND NOTES.

Interesting Experiments with the X Rays.—In the *Photographisches Wochenblatt*, I. Gaedicke gives a very interesting account of some experiments he has made in the Röntgen ray photography, to determine the value of several substances recommended for screens. A screen was coated in sections with platino-cyanide of barium (Kahlbaum's), Balmain's paint, powdered fluor spar (ordinary), sulphate of quinine, platino-cyanide of potassium, natural fluor spar (very pure), and pentadecylparatolylketon. An induction coil, giving a spark of 11 cm., and a Hittorf's tube were used. An ordinary plate was dipped in a bath consisting of—

Water	1000 c. c.
Erythrosine dissolved in spirit 1:380	40 „
Solution of silver nitrate 132:1000	16 drops.
Strongest ammonia	4 c. c.

After drying, the plate was placed in contact with the screen, and wrapped in black paper and exposed. The results were compared photometrically and relatively to unprepared sections of the screen gave the following values:—

Barium platino-cyanide	9:1.
Potassium platino-cyanide	4:1.
Balmain's paint	2:1.
Both samples of fluor spar	1·6:1.

The other substances made no appreciable difference. It is noticeable that barium platinocyanide gives by far the best result, and Gaedicke reiterates the question, Do the Röntgen rays act directly on bromide of silver, or must they be first converted into light rays in order to act photographically? The order of efficiency of the screens corresponds with their order of fluorescence. There is also the important fact, remarked by Eder, that bromide of silver in a non-fluorescent medium, such as collodion, is insensitive to these rays. Gelatine is, however, a fluorescent substance, and Gaedicke thinks the bromide of silver may be affected by the fluorescent light emitted by the gelatine, which might be determined by experiment.

To Avoid Air Bubbles.—To avoid air bubbles in developing bromide or other papers, Liesegang, in the *Archiv*, recommends that they be immersed in the developer film upwards, and that the film be turned downwards before another sheet is placed in the dish. For the development of chloride papers, without inconvenience from air bubbles, he recommends the addition of alcohol to the developer, for instance:—

Water	200 grammes.
Gallic acid	1 „
Acetate of soda	10 „
Alcohol	50 „

Modern Printing Processes.—Jul. Raphaels writes concerning modern printing processes in the *Photographische Correspondenz*. If our prints are to appear "unphotographic," we must give as much attention to their production as to making the negative. Photogravure he pronounces unrivalled in this respect, but how few amateurs or professionals can work the process. After comparative experiments with platinum, bromide, and many sorts of printing-out papers, he gives the preference to matt-surface chloride, slightly printed and developed. Weak negatives give less satisfactory results than good negatives full of contrast. The developer to be used is important. Hydroquinone produces a reddish image, easily toned, and too like an ordinary print. Gallic acid is much better, producing olive-green to green-black tints, that do not require toning. The exposure should be a quarter to one-sixth of that given for a fully printed image. The developer:—

Water	100 c. c.
Concentrated alcoholic solution of gallic acid	5 c. c.
Fifty per cent. solution of acetate of soda	10 „
Alcohol	25 „

The print should be rather over-developed, then washed and fixed. To modify the tone, after development, the combined bath may be used.

Stripping Negatives.—Two methods for stripping negatives from glass are given in the *Photographisches Archiv.* The first by Mussat is on the following lines. The plate is first placed in a bath consisting of one part of the commercial formalin and ten parts of water. After soaking for five minutes, it is rinsed with water, and the film is cut through with a knife at about $\frac{1}{10}$ inch from the edge. The plate is then placed in a water bath and the temperature raised to about 120° Fahr. The film separates from the glass, and is transferred to a collodionised plate. It may then receive another coating of collodion, and can easily be separated from the temporary support. The second method, by Roy, recommends the use of a bath consisting of 100 parts water, 50 parts formalin, and 5 parts glycerine. The film is cut through at the edges and allowed to dry. To strip the film from the plate, place the negative for three minutes in a bath of 100 c. c. water, and 20 grammes carbonate of soda. Without washing, immerse it in a five per cent. solution of hydrochloric acid. The carbonic acid generated between the film and the glass will effect the separation. The film is then transferred to collodionised glass, recollodionised, and stripped. In either case the film does not expand.

The Apprenticeship System in Germany.—A recent case cited in the *Deutsche Photographen Zeitung* may encourage English apprentices to be more contented with their lot in this country. By recommendation of the Potsdam Military Orphanage a widow was induced to apprentice her son to a photographer. She summoned the man to show cause why the indentures should not be cancelled, as her son complained he could learn nothing at the establishment [?] It was admitted that the lad was set to work to make coffee, peel potatoes, clean boots, mend stockings, go to market, turn the mangle, and watch the baby, sometimes till one o'clock in the morning. He was also sent to other tradesmen to borrow money, and was once told to exchange the caps of his master's children, and, if caught, to say he was apprenticed with a certain tailor. The Court ordered the indentures to be cancelled on the ground that the lad had been taught to lie, but they also found that he had been employed too much as a servant. The master was ordered to give up the bed and other things belonging to the apprentice, but a counterclaim was set up for M. 100 (5*l.*) damages, for photographs spoiled. This was too much for the Court. The Judge exclaimed, "It is a disgrace to hear such a thing," and added he would call the attention of the managers of the Military Orphanage to the case and warn them against this master.

OVER-EXPOSURE AND CHLORIDE RESTRAINERS.*

The four experiments which I am now about to describe will serve to give some idea of the capabilities of the iron bath, and of its power of controlling the growth of density.

The plates employed in the experiments were the Ilford (ordinary brand), and the exposures were made in a well-lighted room.

The first plate was exposed for thirty-five seconds on a portrait subject, the aperture of the lens stop being *f*-14, and the time of day 12.40 p.m.

Without any preliminary treatment it was developed in a solution made up according to the Ilford formula for normal exposures, each fluid ounce of developer containing

Pyrogallol	3 grains.
Crystallised sodium carbonate	22 „
Sodium sulphite	22 „
Potassium bromide	·5 grain.

When one minute and a quarter had elapsed, the image began to appear, and half a minute later it was visible in all its details. After the plate had remained in the bath for two minutes, the developer was diluted with water to half its original strength, and the development was continued for three minutes longer.

The standard negative thus obtained was clear, but vigorous, and showed no signs of over-exposure.

The second plate was exposed for fifteen minutes, the subject being the same as before, the aperture of the lens stop *f*-28, and the time of day 12.15 p.m. It will be observed that the exposure given in this case was about five and a half times in excess of what was required, the correct exposure being approximately two minutes and a quarter.

The exposed plate was soaked for twenty minutes in the standard ferric-chloride solution, and was gently rocked during the immersion. After being well rinsed in water, it was transferred to the developing dish. A freshly prepared soda developer (formula as above) was again employed. On being flooded with the developer, the film became instantly black all over. In the course of a few seconds the black colour changed to a deep brown, which grew gradually fainter and fainter, and in about two minutes' time entirely disappeared, leaving the film of its original hue. Two minutes more passed before the first outlines of the image became visible. The growth of density proceeded steadily, but remained quite under control. The process of development lasted eight minutes in all.

The finished negative was of good quality, *and showed no signs of over-exposure.* The range of contrast obtained was quite equal to that exhibited by the standard negative, though the tone was slightly colder than that of the latter, more resembling that produced by ferrous-oxalate development. Towards the foot of the negative a small portion of the image was eaten away at the point where the developer had first come in contact with the film. This would not have happened had the developer, instead of being poured over the surface of the plate, been transferred to the bath and the plate then dropped in.

The third plate was exposed for two minutes on the original subject, the aperture of the lens stop being *f*-14, and the time of day 12.30 p.m. The exposure given was about 2·4 times in excess of the correct one. The following developer was employed:—

Pyrogallol	2 grains.
Ammonium bromide	9 „
Ammonia (·880 s.g.)	10 minims.
Water	1 fluid ounce.

The exposed plate was immersed in the ferric-chloride bath and allowed to remain therein for ten minutes. After being thoroughly rinsed, it was suddenly dropped into the dish containing the developer. Instantly the film became of a rich coffee-brown colour. As before, the stain was rapidly bleached by the further action of the developer, so rapidly, indeed, that in the course of about a minute the film regained its original appearance. Fully six minutes more elaped before any trace of an imege could be detected. Three minutes later the details thereof were clearly visible, but the growth of density was too slow to be perfectly satisfactory. Altogether the process of development lasted for a quarter of an hour.

The result was a fine negative, possessing clear shadows, fairly dense high lights, and remarkably delicate half-tones. There was, again, nothing in the appearance of the negative to indicate over-exposure, the image being in all respects such as might have been obtained by correct exposure and properly conducted development.

The fourth plate was exposed for two minutes and a quarter, the subject being again the same, the stop aperture *f*-28, and the time of day 1.15 p.m. In this case the exposure was practically normal.

The plate wes immersed for two minutes in the ferric-chloride solution which had been employed in the third experiment. After washing, it was transferred to the developer—pyro and ammonia, prepared according to the foregoing formula. The film darkened slightly under the action of the solution, but almost immediately regained its whiteness. Nearly three minutes elapsed before the image began to reveal itself, but, once it did appear, the development proceeded briskly, and at the end of another minute all the details were visible. In order that full density might be obtained, the process of development was, by an error of judgment, continued for seventeen minutes longer.

The resulting negative was thin and decidedly weak, the weakness being, of course, due to over-development. Nevertheless, the range of contrast which the image exhibited was far from inconsiderable, and could hardly have been obtained without the preliminary treatment in the chloride bath.

We see, then, from these experiments, that, by the simple means of a solution of ferric chloride applied to the latent image previously to development, the evils arising from excessive exposure may be completely checked.

We may also, from the same data, draw a few inferences as to the conditions and circumstances under which the remedy is likely to produce the best results.

Firstly, as to the duration of the exposure. The second experiment shows that we may safely give an exposure six or seven times as long as that which, in ordinary practice, we account normal. How much further than this the over-exposure can be carried I am at present, unfortunately, unable to state. Meanwhile. in the ab-

* Concluded from page 234.

sence of more exact information on this head, the working photographer had better not exceed the limits experimentally obtained.

As a safeguard against fog, it is desirable that the developer (particularly when alkaline) should contain a small percentage of a bromide. If the over-exposure be slight, the presence of a large percentage will unduly prolong the development; but, on the other hand, when we have to deal with exposures of not less than three or four times the normal duration, a strongly restrained developer may be employed with advantage. The third experiment may be cited in proof of this, though here, indeed, the bromide might well have been considerably reduced without detriment to the result.

As to the form of developer most suitable for use along with the ferric-chloride bath I can say but little. Of the two developers experimented with, I am, however, inclined to give the preference to pyro and ammonia.

Lastly, as to the conditions which must be regarded as essential to success. Perhaps the principal of these is, that the chloride solution be employed only when in a fresh and active state. Once its available chlorine is exhausted, the bath is of no further use for reducing purposes. On reaching this stage, it assumes a rich orange hue, due to suspended ferric oxide formed by the partial oxidation of the protochloride during the treatment of the latent image. Now, since we are obliged to increase the duration of the reducing process to suit the increase of the exposure, and *vice versâ*, it is evident that we must, for this purpose, employ a chloride solution of constant strength, otherwise we shall have to resort to guesswork to enable us to solve our difficulties. On this account the bath, after being once or at most twice used, should be discarded, and a fresh one substituted.

With a porcelain developing dish of the smallest size ($5\frac{1}{4} \times 4$ inches), two ounces of the solution will more than suffice for a quarter plate.

The length of immersion will, of course, wholly depend upon the exposure; but, to prevent failure, it may be recommended that each plate (whatever the exposure it may have received) be soaked in the solution for at least five minutes.

During the development, it will be found necessary to examine the image by transmitted light from time to time, in order to judge of the growth of density. It must not be forgotten that the real density is likely to be considerably less than the apparent density, owing to the translucent white coating of chloride of silver with which the film is overlaid. After one or two trials, the extent of this deceptive density can be easily estimated.

At some future date I trust to have an opportunity of contributing, by way of supplement to this article, a short paper on the reducing properties of the chlorides of copper and tin.

MATTHEW WILSON.

ON A NEW METHOD OF PREPARING PLATES SENSITIVE TO THE ULTRA-VIOLET RAYS.*

VI.—The Fixing.

The fixing is done in a solution of hyposulphite of soda (1 : 4), and proceeds much quicker than with ordinary dry plates. My small plates for photographing the spectrum in a vacuum readily fix in a few seconds. It is only when the film contains iodide that minutes are required. Silver iodo-bromide plates should always be kept horizontal and lie in the fixing solution face downwards, so that the silver-laden solution may fall quickly to the bottom and make room for fresher and more active solution. For this purpose evaporating dishes are most suitable, and, if chosen of suitable size, they have the further advantage that the plates as they lie can only touch the dish at the edges and corners and not on the surface, and can more easily be laid hold of and taken out of the bath without damage—an advantage not to be under-rated with small sizes. I prefer to employ two baths, the second for the after-fixing. In this way the negative does not require so much washing and keeps better. By long use the bath works more slowly, especially in fixing plates containing iodide. In this case a new bath should be made.

Plates without a binding material require very careful handling to prevent the image from floating away. In this case the film side must naturally be placed uppermost. When all the bromide is dissolved, the best plan is to remove the fixing solution with a syphon. The dish must not be shaken, at most it may be inclined a little at the last, as much as is necessary to run off the remaining fluid from the plate. The same care is necessary during the subsequent washing. When it is allowable, such films may be set fast with a gelatine bath after development. The fixing will be made very much easier thereby.

* Continued from page 248.

VII.—Washing after Development and after Fixing.

If the plate has been coated with gelatine and the silver bromide also contains gelatine, then it will stand a pretty strong stream of water without damage. In any case it can be washed without hesitation in abundantly flowing water. Greater care is necessary if there is no gelatine coating, or if the sensitive bromide contains no gelatine, especially if it is in a thick layer. In this case standing water is better. As a rule, the film stands better than one would expect.

After development I only wash a few seconds, and when it is a case of suddenly stopping the development I plunge the plate into the fixing bath without washing. I keep fixed plates in a stream of water for one to two minutes, and this is generally enough to remove the fixing salt. Larger sizes will take more time. I only work with small plates, and they dry on blotting-paper in two or three minutes. Most of the water runs down to the bottom of the plates, and is absorbed by the paper. The rest I shake off, or let it soak into a slip of blotting-paper I put on the edge of the plate.

Care must be taken not to touch the film with the finger while it is wet. It is very easily damaged in this way, although it will resist a stream of water.

If the plate is required to be dried off quickly, which is desirable for the better preservation of the sharpness of the image, then, after the water has drained off, I hold it close to a stove or lamp chimney. There is no fear of the film melting, as with a gelatine dry plate.

VIII.—The Negative Image.

The negative image forms a lustreless relief of a dark grey or brown colour. By rubbing with the finger, or better with some hard substance, it becomes like polished silver. Even dusting with a soft brush will often cause glittering silvery lines to appear. If the silver bromide contains no gelatine, the surface of the image is much more tender, and the employment of a brush to remove dust, &c., is quite impossible. (With plates containing gelatine the silver film worked over with a burnisher gives after a few strokes a bright silvery film, which is so resisting that it may be highly polished with a leather and rouge.) The image may be further protected by a coat of varnish or gelatine, but not without damage to the sharpness. That is the case, at all events, with line spectra; the conditions are not the same as with ordinary dry plates, in which the image is within the gelatine film; in the new plates it is more like a small silver rod on the gelatine coating. The silver particles which compose this little rod lie thickly and closely together in the best of my pictures; hence they show such extraordinary sharpness under the microscope. As soon as the varnish runs over these small rods it causes a swelling, which naturally must have some injurious influence on the definition of the edges of the lines upon which it falls.

XI.—The Intensifying.

Plates with a very fine grain sometimes fail in density. In this case they must be intensified. I hoped at first to be able to use silver intensification with advantage, but the trials did not answer my expectations. I have, however, obtained satisfactory results by bathing the plates in a solution of mercury bichloride 1·50, well washing, and then treating them with dilute ammonia at 1·10, followed by copious washing. As a rule the intensifying of spectrum negatives is not to be recommended, because it deprives them more or less of their original character and delicacy. The image should always derive the necessary density from the developer.

X.—Sensitiveness.

I have at present very few observations on this point. Until quite lately I had not the vacuum apparatus necessary for the proper treatment of this subject. Such of my results as are of importance for the purposes of this paper I give below.

Silver bromide is, as already stated, made more sensitive by the presence of silver iodide and gelatine. The same result occurs whether it settles in gelatine or if the grains of silver bromide are in contact with gelatine on one side only. Its sensitiveness is considerably increased thereby.

Plain glass plates were coated on one half with gelatine, and silver bromide was allowed to settle on them as before described, so that one half of the plate had a coating of gelatine with silver bromide above it, while the other was coated with the bromide alone. The two halves touched each other in a straight line which equally divided the image of the spectrum into two halves in the direction of its length. Each exposure gave a complete spectrum on both halves of the coating. When exposed to the spectrum of the sun, the gelatine half showed itself certainly four or five times more sensitive than the glass half. (If the gelatine coating shows any bubbles that have burst and left plain glass,

the precipitated silver bromide will be less sensitive in such places and show lighter points and circular spots. Bromide containing gelatine does not show this defect.)

These pictures were repeated with silver bromide that had been precipitated in presence of ammonia, as well as with some that had been precipitated from a solution containing gelatine. Attention was also paid to the thickness of the film of silver bromide. With the silver bromide that had been treated with ammonia the same difference between the two halves appeared as before, but, on the other hand, with that containing gelatine the gelatine substratum, as might have been expected, produced no effect. The explanation of this is easily understood: the sensitiveness of the silver bromide is so greatly increased by its being precipitated from gelatine and surrounded by it that the very much weaker action of the gelatine substratum has no visible effect. The same thing is observed with silver bromide free from gelatine, when it is exposed in films of greater thickness. Hence it is also easy to see that in this case the photo-chemical action of the rays of light only reaches the outer layer of the film which does not come under the influence of the bromine-absorbing action of the gelatine (H. W. Vogel), like the particles of bromide deposited directly upon the gelatine substratum. In this case the action on the two halves of the plate must be exactly the same.

The new plates are not very sensitive to sunlight. At a height of 120 metres above mean sea level (Leipsic), I obtained with a June sun wave-length 293·97 $\mu\mu$, and with highly sensitive dry plates under the same conditions, with only a third of the exposure, wave-length 293·70 $\mu\mu$.*

With an exposure of such duration (40 minutes) as was necessary for this, the spectrum on the ultra-violet sensitive plate breaks off sharply as an opaque band of action at wave-length 297·38 $\mu\mu$, and runs on further from there in distinct lines on a clear ground as far as wave-length 293·97 $\mu\mu$. This clear glass ground in the neighbourhood of the most refrangible ultra-violet rays of the sun is an advantage of the new plates. Under the same circumstances, ordinary plates give thick fog, in which the most refrangible lines become first of all indistinct, and, if an effort is made to photograph them more clearly by longer exposure, they disappear entirely. On account of this defect the observation of the most refrangible rays of sunlight on ordinary plates is made considerably more difficult. At the same time, they are always to be preferred on account of their greater sensitiveness.

The new plates can only come into question in cases where they excel both in intensity and in sensitiveness. This first occurs at wave-length 220 $\mu\mu$, and from this point onwards their sensitiveness increases. Consequently their greater working power is more in their unusual intensity, and is based on the fact that, in consequence of their small sensitiveness for the less refrangible rays, there is nothing to hinder their being exposed for a long time without becoming thickly fogged as ordinary dry plates do. The origin of this fog is diffused light arising from the inside of the prisms and lenses of the spectroscopic apparatus, of which the principal part consists of rays for which gelatino-silver bromide emulsion is much more sensitive than pure silver bromide.

Since the use of gelatine has so distinctly improved my pictures of the less refrangible rays of the new spectral region, there was no reason for excluding it, for the opening up of the remaining part of the spectrum as far as wave-length 100 $\mu\mu$. My attention was first of all attracted by its presence about the limits of action of the plates employed. Circumstances have unfortunately not yet allowed me to approach more closely a solution of this question.

The resumption of my experiments on plates should quickly settle the behaviour of pure silver bromide with regard to wave-length 100 $\mu\mu$, and, as the following considerations will show, there is some hope of success.

If one considers, that is to say, that gelatine even in a thickness of only 0·00004 mm., sensibly weakens the rays of wave-length 185·2 $\mu\mu$, and that in still much thinner layers it apparently stops all photographic action of ordinary dry plates near wave-length 182·0 $\mu\mu$, and, on the other hand, that the course of its absorption curve between 220 $\mu\mu$ and 182 $\mu\mu$ shows no increase, but rather a lessening of its transparency for the rays of the more strongly refrangible region, it is quite a surprise that, in opposition to this, it should be practicable to photograph the extensive region of the smallest wave-lengths, as I have ventured to designate the part of the spectrum lying between 185·2 $\mu\mu$ and 100 $\mu\mu$, by means of gelatine. An explanation of this is to be found only in the sensitising action of the gelatine, which possibly gets the upper hand in the struggle with absorption, and begins to lose it where the range of action of the new plates ends.

Under these circumstances it may be expected that the discovery of the unknown spectral region beyond wave-length 100 $\mu\mu$ is reserved for the pure silver haloid. Gelatine will, however, in this case also hardly be superfluous, because, when used as a substratum, it forms the only possible means of increasing the sensitiveness.

XI.—The Keeping Qualities of the Plates.

I have kept plates prepared in different ways for a long time in order to test their keeping qualities from time to time. They were kept unpacked in a light-proof cupboard, and consequently were not protected against the action of the atmosphere. From my experience with gelatine emulsions I was afraid they would show unevenness in their coating, and above all increased fog round their edges and a greater development of the imperfections of their surfaces. Pictures taken with them show, however, the contrary. The plates work even more cleanly after keeping than when freshly prepared, and some kinds were even more sensitive. I did not, however, make comparative trials with the sensitometer. My experience is founded only on the photographic pictures of the new rays beyond 185 $\mu\mu$. According to this, the new plates can be kept quite as long as ordinary dry plates. Compared with those coated with an emulsion containing silver oxide and ammonia, they show even far superior keeping powers.

On the Employment of the Plates Sensitive to the Ultra-violet.

The plates were intended from the very commencement for photographing the spectrum, and have hitherto only been used for that purpose. How they answered (and, not less, in what points they still failed) is shown in the foregoing account, and further in my former paper I have pointed out their good and bad qualities impartially, because I did not wish to promise more than they could be trusted to perform. I therefore consider disappointments in their use as entirely excluded from discussion.

As a measure of their actual capabilities the spectra 11 and 12 on Plate V. of the above-mentioned paper* may be referred to. It may, however, be remarked that the definition of these spectra has suffered from defects in the crystal of the fluor-spar prism employed, and that the same plate exposed to the diffraction spectrum has given a clearer picture. A proof of this is afforded by my enlargements to more than 300 times of the diffraction pictures of the rays 162 $\mu\mu$.

The sharpness of my negatives has here and there led to the belief that the new plates can be used advantageously for astro-photography. Against this, however, there are two important obstacles, the want of sensitiveness and the formation of a round grain in the negative.

For the rays of light with which astro-photography has to do, the plates hitherto in use are many times more sensitive than the new ones. The use of the latter could only be thought of with considerably prolonged exposures. Astro-photography, however, requires the exact opposite, shortening of the exposure. Further, the disc-shaped negative grain arising from chemical fog, as has already been fully explained, is so like the picture of a star that some of my plates have quite the appearance of a picture of the starry heavens. Under such circumstances mistakes could hardly be avoided in star pictures. In that case, too, the precautionary measures that have hitherto been employed for recognising defects of the plates will not have the desired effect, because the grain alluded to often comes out very strongly. Both defects outweigh the advantage of greater sharpness of image to such a great extent that the new plates cannot be recommended for astro-photography, and for professional photography still less. The only use they might find would be for line reproductions. The perfect sharpness with which they reproduce lines and their absolute opacity would certainly place them in the first rank for this, if the preparation of faultless films over large surfaces did not only involve considerable difficulties, but was also too costly and took up too much time to play.

I have not used them for portrait or landscape photography, but for the same reasons, and still more on account of the want of half-tones, they are quite unsuitable for such purposes.

They completely fulfil only their original object, the observation of the rays beyond wave-length 220 $\mu\mu$, but for this purpose they are at present not to be replaced. Victor Schumann.

(To be continued.)

* Both lines belong to the extension of the ultra-violet sun spectrum discovered previously by Herr Oskar Simony. I took their wave-lengths from the drawing published by A. Cornu in the *Comptes Rendus* (vol. cxi.), of this part of the spectrum extending to wave-length 292·22 $\mu\mu$, which was made from Simony's original photographs.

* Sitzungsberichte, Bd. cii. Abth. 2 *a*: "*Uber die Photographie der Lichtstrahlen kleinster Wellenlängen*," Part II., 1893.

WELLINGTON'S IMPROVEMENTS IN MEANS FOR FACILITATING THE SEPARATION OF GELATINE COATINGS FROM PAPER SUPPORTS.

Mr. Wellington's invention relates to a mode of preparing a paper support upon which a photographic film, consisting wholly or in part of gelatine, can be coated, from which support the photographic film can be stripped prior to its being coated with emulsion, and he thus describes it:

"My invention consists in the treatment of a temporary backing of paper with a substratum which permits the ready stripping of a gelatine coating made upon it from this support. The said treatment is based upon the employment of gums in alcoholic solution as this preparatory substratum.

"In carrying my invention into effect, I coat upon any suitable paper, as for instance, upon the well-known photographic paper coated with baryta, whether matt or calendered, a substratum containing a suitable proportion of any gum or resin dissolved in any of the well-known solvents which are in general use for this purpose. In practice, I have found that good results may be obtained with gum mastic and gum, thus: in varying proportions dissolved in methylated spirit, or with other gums and resins, as, for instance, damar, copal, and their congeners, but I preferably use gum sandarac or gum copal. The consistency of the solution of these gums is in like manner capable of considerable variation, and will depend, in great measure, upon the means which are adopted for coating the paper; for instance, if the paper be coated by immersion in a trough, a solution of one part of gum sandarac or gum copal, and ten parts of methylated alcohol will be found to answer satisfactorily.

"Having thus prepared my paperbacking by coating it with a substratum of gum, and permitted it to dry, I proceed to coat thereupon a layer of gelatine, which may, if desired, be rendered insoluble by the addition thereto, immediately prior to coating, of a suitable proportion of soda alum, chrome alum, or any of these well-known chemicals which have the property of rendering gelatine insoluble when dry.

"Upon this gelatine I may coat a celluloid film, preferably doing this in the manner set forth in the specification of Letters Patent, No. 14,274 of 1893.

"The film body may, in like manner, be formed of any transparent, non-hygroscopic material other than celluloid, which is capable of conjunction with, that is to say, adhering to the gelatine substratum in the manner set forth.

"If desired, in lieu of coating the gummed paper with gelatine and the latter with celluloid, and then, after stripping the film from the gummed paper, applying sensitive emulsion to the gelatine surface of said film, I may apply a sensitive emulsion direct to the gummed paper, and afterwards apply a backing of celluloid or other suitable transparent material thereto.

"When the film body, however composed, has become thoroughly dry, I strip it, together with the gelatine upon which it was coated or of which alone it consists, from the paper backing, preferably by winding the film upon one roller and the gummed paper backing upon another roller, the function of the substratum of gum proposed in my invention being to facilitate the separation of the gelatine from the paper. In case the gelatine film has been coated with celluloid or other transparent, non-hygroscopic material, the film obtained may then be coated with sensitive emulsion, the gelatine surface being particularly well adapted to receive, and to cause, the adhesion of the sensitised vehicle.

"The claims are: The improved means for facilitating the separation of gelatine coatings from paper supports in the manufacture of photographic films. In means for facilitating the separation of gelatine coatings from paper supports in the manufacture of photographic films, the interposition of a coating or substratum of gum between the paper and the gelatine coating."

COLOUR IN NEGATIVES.*

Experiment A.—We will first take the case of a normally exposed plate—say one that will develop to full printing density in about three minutes without any further additions to the developer. Such a negative, after rinsing under the tap, is fixed, as usual, in hypo, and then washed again, and, when dry, will be found to have a small amount of yellow colouration in it, not very much, but still it is there, as comparison with a metol-developed plate will prove. It is just enough to give us the desired richness in printing.

Plate No. 2 shall prove to be a bit under-exposed. When it makes its first appearance, we quickly decide that it wants a fillip, and we add accelerator composed of soda carbonate and soda sulphite. Probably, before it is finished, we give it another dose, and, if it is an extreme case, we may even soak it in accelerator only. This plate, when dry, will be quite different in colour to No. 1. The more accelerator there has been added the greyer the colour, until, in the extreme case, it will be nearly as pure and as free from stain as a metol plate.

* Concluded from page 236.

Plate No. 3 shall be known beforehand to be grossly under-exposed. This one we shall not put into a normal developer, but we will reduce the quantity of pyro until we have only a quarter of a grain of pyro and one-sixteenth of a grain of bromide present to the ounce of mixed developer. The deficiency in quantity is made up by adding water, whilst the amount of accelerator remains constant. This plate will be a very long time developing, and we might expect a deep yellow stain to result, but the sulphite of soda is so largely in excess of the pyro that it, to a large extent, prevents this, and, when finished, it will be found to be only a little deeper in colour than plate No. 1.

Plate No. 4 shall prove on development to be over-exposed. We immediately dose it with pyro and bromide stock solution; if very bad, by adding a few drops of ten per cent. bromide solution. This plate will also take a long while to attain density, and will have most colour of all—a great deal too much, in fact, making it a very slow printer.

Now we have four negatives that differ enormously in colour when dry. We can modify to some extent those that have too much colour by soaking in a bath of alum and acid (citric or hydrochloric), but we cannot impart colour to the grey one. The nearest approach is a dilute bath of bichromate of potassium, but it doesn't give us exactly the same result as would the pyro colour proper.

All this you, doubtless, know. Well, we will try again.

Experiment B.—Four plates of equal exposures (and that normal) shall be developed in the normal developer for an equal length of time—say, three minutes. On removal from the developing dish, allow one to wash under the tap for thirty seconds (time it with your watch), and then transfer to the hypo. No. 2 wash for thirty seconds, and then allow it to drain in a rack for thirty seconds before fixing. No. 3, wash one minute and fix. No. 4 wash one minute and drain one minute, then fix. These four plates when dry will again give us different results. No. 1 will be about right, Nos. 2 and 3 will be decidedly yellower, and No. 4 nearly as bad as No. 4 in Experiment A.

Did you know that before, or have you ever utilised the knowledge?

Experiment C.—Four more plates. That makes a dozen! Ah, well! 'tis only 1s., and we may learn something from it. All four shall be normally exposed, developed for three minutes, washed for thirty seconds, drained for thirty seconds, and then fixed. Whilst they are in hypo prepare an alum bath, strength about three per cent. No. 1 plate shall wash after fixing for one minute, and then be transferred to the alum bath. No. 2, three minutes' washing followed by alum. No. 3, five minutes' washing and then alum. No. 4, transfer to the washing tank without any washing at all. After drying, comparison will again teach us much. No. 1 will resemble No. 1 in Experiment A. The others will progress in colour until No. 4 will have a sort of olive-green tint, which will be very objectionable in this particular negative, but which would be invaluable in a thin negative that would otherwise print much too weak and flat.

If you care to break into another dozen plates for experimental purposes, you will find that shorter or longer soaking in alum will give more or less colour, but the differences are not great. After drying, you might also try the effect of alum and acid on the various plates. Plate No. 1 in each experiment will be deprived of almost all its colour. The others will give up less and less of their colour to the acid solution until, with No. 4 (Experiment C), you will find that the colour (if discharged at all) re-forms during the final washing, and when dry it will be as yellow as ever.

Now see how you can ring the changes in producing or repressing colour in a negative. To put it to a practical test, we will go back to Experiment A. This is how I should have dealt with those four plates. No. 1, normal exposure and normal development. (I must premise that I much prefer all plates, if possible, to be alumed; they dry quicker and more evenly.) Therefore I should wash it before fixing about thirty seconds, let it drain fifteen or twenty seconds, fix ten minutes, wash one minute, alum one minute, and transfer to washing tank. No. 2, under-exposed, added accelerator during development. I should wash at least three minutes, and set aside to drain for another minute before fixing. After ten minutes in hypo, wash until a good body of colour forms in it (probably about three minutes), and then alum. Supposing it have an extreme case which had needed soaking in accelerator, I should plunge it for a moment or two into old normal developer to overcome the excess of sulphite in the film. This should be done when development is considered complete, and it must only be for a very short time, or the high lights will begin to gain undue density. Then proceed as before. If after fixing, it still did not gain enough in colour, I should omit the alum bath, and I *have* gone to such lengths as to return it to old, discoloured developer after fixing if I could not attain the colour any other way. No. 3 will probably do with thirty seconds' washing, and no draining before

hypo. After fixing treat as No. 1. No. 4, over-exposed, very prolonged development, additional pyro, &c. I must keep the colour down as much as possible. Five seconds' washing with the tap full on, slip it into hypo quickly, and let it stay there at least a quarter of an hour. I won't look at it until it has been thoroughly fixed and through alum, because I know that every moment it is exposed to the atmosphere will help to form colour in it. At the end of the time decided on for fixing slip it out quickly, just a perfunctory rinse under the tap—not more than five seconds—and then into alum for half an hour. I know it will spoil my alum bath by carrying hypo over into it, but I value my negative more than I do the alum. After this, it will require more than the usual amount of washing, as the film will be very tough. After drying—not before—alum and acid may be resorted to if necessary.

I think I have said enough to show how the thing works. You will find, in practice, that it is much easier than it reads. I do not advise a greater proportion of sulphite in the developer than that given, because if more is present it means proportionately longer washing, &c., to attain the desired amount of colour. As before stated, I much prefer a negative to go through alum, therefore I always wash long enough before fixing to make the alum bath a necessity afterwards.

My negatives, at one time, were of all sorts and conditions of colour, and I was much puzzled to know why. Having found out the reason, I was not long in putting the knowledge to further use, as above described. Briefly put, the matter resolves itself into this: Pyro-soda or pyro-potash developed negatives, if washed and drained sufficiently before fixing, acquire the power of turning yellow after fixation, and this in such a gradual manner that it can be stopped at any desired moment by the use of the alum bath.

The two extremes may be stated as follows: A negative, harsh in contrast, which I should endeavour to keep free of colour, that it might print softer, and a negative lacking in contrast, which I should make yellow to increase the brilliancy of the resulting print. Or, again, they may be an under-exposed, forced negative, lacking the necessary vim and go for printing, and a thick, dense, over-exposed negative, which in itself, without colour, would prove a slow printer. The remedies for the latter two are apparent from what has gone before.

In conclusion, *if* you wish to have an even, grey colour to all your negatives, and do not want the additional power which is thus placed in your hands, it is only necessary to use an acid fixing bath, or even a small proportion of ordinary sulphite in the hypo bath, and you will not be troubled with colour in your negatives. It is, however, not a trouble to me—it is an advantage—*when under control.* W. E. A. Drinkwater.

BRUSHING.

Of the many manipulations connected with the practice of photography, perhaps there are none deserving of more consideration, and which, at the same time, receive so little attention at the hands of photographers generally, than the use of a brush in development, and other equally important operations connected with an all-round practice.

No doubt, the use of a brush is strongly urged by some plate-manufacturers, in combination with the ordinary application of a quantity of developing solution to a sensitive plate by means of flooding the developer over its surface, and the Platinotype Company have been instrumental in drawing the public's attention to the advantages of this method of developing their admirable printing papers, chiefly through the medium of an excellent little handbook, and which they circulate among all the dealers for the purpose of giving instructions as to the best means to follow in the working of their sensitised papers. But, with the vast majority of workers, the idea of using a brush in many of the ordinary operations connected with the practice of photography is almost entirely unknown, or at least the writer has found it so during the course of a pretty wide experience among a large number of members of the various photographic societies in the west of Scotland.

Of the numerous uses or applications to which a broad camel's-hair brush may be put with advantage, perhaps there is none more strikingly practical than the part such plays in the development of prints on large or small-sized sheets of bromide paper. Any one who has never seen a brush used, and who happens to be a witness for the first time to the bringing into view by means of development of such images by the merely passing across the surface of the paper a soft camel's-hair brush well charged with developing solution, invariably gives vent to an expression of surprise at the extreme ease and simplicity of such an operation, as compared with the more commonly practised and cumbersome method of flooding the entire surface, very probably, of a large-sized sheet of paper with a considerable quantity of expensive developing solution.

It only wants to be once optically demonstrated to cause the brush being for ever afterwards adopted for such a purpose.

But very little consideration will be required by any one having experience in the development of enlargements on bromide paper to see at once that not the least of the advantages pertaining to the use of a brush lies in its *economy*. With metol at 2*s.* 6*d.* per ounce, and which is now so much in vogue for the development of bromides, and which bids fair to rival and supplant our good old friend, ferrous oxalate, this question of economy alone becomes an important factor, for, in reality, the adoption of brushing in place of flooding necessitates the employment of a very much smaller amount of developing solution (probably only one-fifth of what is required in flooding) when such is employed to the entire surface of a print in one full wave of developer.

It is not, however, on the score of economy alone that the advantages lie with the use of a brush; there are several others of which mention should be made, viz., the power an operator possesses of retarding or hastening the development of any desired portion of the image during the time such is seen coming into existence. With a brush the entire operation of development is at all times completely under control, and many a fully exposed proof can be manipulated in such a manner as to cause the same eventually turning out an acceptable print, which, by the method of flooding, would only yield poor, flat results; whereas, when brushing is resorted to, at no time does an operator lose control or allow the image to get beyond his being able to retard or accelerate the development of such as a whole or in part, for by means of one or two extra brushes, which should always be kept at hand, well charged by soaking the same in specially prepared redeveloping solutions provided for this purpose, certain portions may be kept back, and others hastened forward in quite a marvellous manner to those unacquainted with this extremely useful and practical method of development.

Any one who for a moment gives this subject a little thought, and who judges these manipulations from a common standpoint, is very apt to imagine that such a method as I am advocating is more liable to cause streaks or surface markings than would be the case with the old, or rather more commonly practised (for brushing is not a new idea), method of flooding the entire surface with one full wave of the developer; but in practice such objections do not exist, although those workers who have never seen a print brushed into existence are very liable to imagine that such would be the case; and especially is this so with those who, for the first time, are eye-witnesses of the operation, for the first brush marks invariably bring into view those parts where the brush has applied the developer at the very outset, somewhat in advance of those parts where the brush was applied a few seconds later on. A very short time is needed, however, to show how beautifully all this seeming irregularity is dispelled, for, in a very few seconds, the parts where the brush was latest applied catch up the earlier strokes, and all the portions develop out in beautiful regularity without any of the attendant difficulty and mess nearly always present when dealing with the slunging of large quantities of developing solution in large wooden or other kinds of dishes.

By the use of these extra brushes high lights can be retained and strength added to shadows and the other black portions of a positive image in quite a marvellous manner.

It is not only, however, in development that brushing proves particularly useful in the hands of an operator. As I write these lines, I see before me the results attained by means of a brushing operation that would have been quite impossible of accomplishment without the services of such. I refer to the advantages a brush confers in the application of a solution of mercury to certain portions only of a negative that required being strengthened in parts without applying such as a whole.

In such cases as this, no doubt, brushing confers a great advantage, and much may be done to even intricate parts of a negative by means of a brush that cannot be treated in any other way.

The partial intensification of negatives has always been a subject of much importance with advanced workers, and a good many somewhat intricate dodges have been resorted to from time to time whereby certain parts of a negative are specially prepared with some preservative temporarily, so as to permit of other portions receiving an application of mercury without the same affecting the parts so shielded. Indiarubber solution, gum, and, in some instances, varnish, has been used for this purpose of temporarily protecting the parts that were already dense enough. In my experience, all such expedients are unnecessary, for the parts it is intended or desired to intensify can be easily treated with mercury by means of a broad or

finely pointed camel's-hair brush in an extremely effectual manner by simply touching such parts with a damp brush, or, in other words, with a brush that is not overcharged with mercury.

To those anxious to try this method of working I offer the following suggestions. Any negative that it is desired to intensify in parts only should be first well soaked in cold water until the entire surface of the film becomes soft; it is then placed away on end to drain in some cool place; in about an hour's time all the water that the gelatine has not absorbed will have left the surface of the negative, the film of which will now be in a soft and somewhat swollen condition, but there will be no surface water that could possibly convey by running any mercury that is applied to its surface by means of a brush.

When the negative is in this damp condition, it is either placed on a retouching desk, or, preferably, on a horizontal support with a white reflector underneath. A suitable brush, according to the size of the parts it is intended to apply the mercury at, is then used in a *damp* state, charged with the intensifying solution, and with this those parts only are treated; in a few minutes it will be seen that such begin to thicken up nicely. Broad parts can be treated with a flat brush. Then the negative is well washed again, and finally the ammonia solution applied. Such is another of the many advantages of using a brush, and, once an operator begins to taste of its great utility, he will never discard it. T. N. Armstrong.

PHOTO-CHEMICAL NOTES.

Solubility of Silver Haloids in various Solvents.—Some time ago, Professor E. Valenta published the results of experiments made to determine the solubility of the silver halogen salts in their various solvents (see The British Journal Photographic Almanac for 1896, p. 957). Herr Ernst Cohen, in a recent paper (*Zeit. Physikal. Chem.*, 1895, pp. 1861–9), points out that the figures given by Valenta are not those deducible from the equations according to which the solvent action is supposed to take place, at any rate as far as potassium cyanide and sodium thiosulphate are concerned. He has therefore examined these solubility phenomena, and finds that silver chloride, if not present in excess, dissolves in sodium thiosulphate solution according to the equation—

$$3Na_2S_2O_3 + 2AgCl = (AgNaS_2O_3)Na_2S_2O_3 + NaCl.$$

If, however, the argentic chloride is in excess, a less soluble salt—$Ag_2Na_2S_2O_3$—is formed. Potassium cyanide also exerts its solvent action on chloride of silver, if not in excess, according to the equation—

$$2KCN + AgCl = KAg(CN)_2 + KCl.$$

whereas, in the presence of excess of silver chloride, the above double salt is partly decomposed with the formation of silver cyanide and potassium chloride. These two latter compounds can act in the reverse way until a state of equilibrium is reached. It is stated that Valenta's results were due to the fact that he operated with a large excess of silver haloid.

Estimation of Formaldehyde.—The employment of formaldehyde or "formalin" in photography renders some means of ascertaining its strength desirable. M. Klar (*Pharm. Zeit.* pp. 40–611) proposes the addition of an aqueous solution of aniline by which methylene aniline is precipitated and may be filtered off, dried at 40° and weighed. A more expeditious method, however, is to titrate the excess of aniline in the filtrate using Congo red as an indicator. A standard decinormal solution of hydrochloric or sulphuric acid is gradually added from a burette until the red colour acquires a strong bluish tone, remaining unaltered on the addition of a further small quantity of acid. The original aniline solution is similarly titrated. Each cubic centimetre of decinormal acid represents ·003 gramme of formaldehyde.

New Reagent for Bromine and Iodine.—Solutions of metallic iodides or bromides when mixed with dichloro-benzine sulphonamide have their respective halogens liberated. This reagent is recommended by J. H. Kastle (*Amer. Chem. Journ.*) as a substitute for chlorine water. It can be used either in the solid state or in solution in carbon bisulphide. By its means ·0000127 gramme and ·0000065 gramme iodine together with ·04 gramme and ·0036 gramme bromine respectively may be recognised.

New Method of Preparing Oxygen.—Now that hydrogen peroxide is becoming a fairly cheap article of commerce, it may be practicable to employ the extremely convenient and easy method of preparing oxygen gas from it which a writer named Dioscoride Vitali has recently introduced (see L'Orosi, 1895, 1–5). When hydrogen peroxide is added to ammoniacal solution of copper sulphate, oxygen is evolved in abundance in the cold. An indefinite quantity of the dioxide can be decomposed by means of the same quantity of the copper compound. Hence, by allowing hydrogen dioxide (3–4 per cent. sol.) to drop from a tap funnel into a saturated solution of ammoniacal copper sulphate (20–30 c. c.) contained in a capacious Woulfe's bottle, a supply of gas can be most easily obtained. The gas is dried and purified from ammonia by passing through sulphuric acid. The *rationale* of the reaction appears to be similar to the decomposition of potassium chlorate in presence of manganese dioxide, the cupric compound reacts with the dioxide, yielding a cuprous salt and free oxygen, and the cuprous compound is then re-oxidised by another portion of the peroxide.

The Presence of Ozone in Oxygen.—Any one who has prepared oxygen from potassium chlorate and manganese dioxide is aware of the intense odour of the gas thus obtained. It was formerly thought that this odour was due to chlorine or an oxide of chlorine in the gas. Experiments, however, made within recent years have shown that the odour is due to ozone, and that only a trace of chlorine is evolved. A paper by Herr Otto Brunck on this subject (*Zeit. Anorg. Chem.*, 1895, 10, pp. 222–247) throws light on this question by showing that oxygen gas when passed over heated manganese dioxide is partially converted into ozone, and that increasing the quantity of manganese dioxide used in preparing oxygen raises the proportion of ozone in the gas. Herr Brunck has exhaustively examined the action of most of the metallic oxides in this respect, and finds that they all act in the same way, though none of them so powerfully as manganese dioxide. G. E. Brown A.I.C.

The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* Journal *useful and instructive.*

Chlorophyll.—Orthochromatic writes as follows: "The recent mention in The Inquirer column of chlorophyll as applied to collodion emulsion induced me to try its effect as an orthochromatising agent, as I have some recollection of seeing a statement by Mr. Ives, I think, to the effect it may be used in collodion emulsion without any free silver. If this be so, it is in the highest degree important, since, in the first place, an orthochromatic emulsion can be made that will keep, and, secondly, sensitiveness to the less refrangible rays being the weak point of collodion emulsion, practically greater sensitiveness will be gained. But I have tried it and failed, failed in so far that I find chlorophyll absolutely inert, neither beneficial nor the reverse. I have added it to washed emulsion and used it both wet and dry, and also under the same conditions with emulsion unwashed; I have exposed without a coloured screen and with, but without finding the slightest difference in action. The chlorophyll has been extracted from the leaves of the common periwinkle as well as from those of ivy, and the only difference I can find between them is, that in a given time the latter yields a far stronger solution. Mr. Ives has had considerable experience in this direction, perhaps he can tell me what is wrong or why I have failed."

Sulphite of Soda.—An Old Amateur writes: "*In re* the 'Amusing Reply' discussion I am reminded that the sulphite of soda of to-day does not appear to be the same or to behave in the same manner as that obtainable ten or fifteen years ago; or, as a matter of fact, much of the product now supplied by photographic dealers is anything but pure sulphite of soda, as may be proved by directly comparing it with the pure article obtained from a reliable source. Whether the difference is wholly due to partial oxidation, or whether there are other impurities present beside sulphate, I am unable to say, but I think it would be useful, not only to myself, but to many others, if some fairly easy test for sulphite of soda were available. When I first commenced to use sulphite in the comparatively early days of gelatine, four grains to one of pyro would keep the plate perfectly free from stain; but with many of the plates of the present day a saturated solution will barely do so. The plates themselves may differ, but I can scarcely comprehend the possibility of the whole of the difference lying there; the pyro as Mr. Cadett suggests, may vary, but *I* think myself it is far more likely to be the sulphite. In former days I failed to notice any retarding action on the part of sulphite; now, with the substance so called, 'Made in Germany,' I suppose development takes three times as long. As amidol, metol, and suchlike owe most of their developing action to the sulphite, it seems to me that the matter is one of importance. Is such a test as I suggest available?"

Defective Collodio-chloride. (To J. P.).—In reply to this query, I think, perhaps, one of the principal inducing causes may have been the use of solvents containing too large a proportion of water, or the addition of too much water in sensitising the emulsion. Of course, the employment of an unsuitable pyroxyline, as suggested, will have more or less effect on the result; but, with good solvents, there is a very wide latitude in this respect, whereas, when the latter are weak, the best pyroxyline will fail to work satisfactorily. J. P.'s symptoms all point in the direction of too much water. A collodion or emulsion free from water gives a close and structureless film; but, under reverse conditions, it is "crapy," and uneven, and runs, as described, in ridges and lumps. The tendency to solidification, which is always present where there is a considerable excess of acid in the emulsion, is also greatly increased by weak solvents, so that, on the whole, I fancy, if J. P. will look back, he will trace his difficulty to the source I mention. The remedy is obvious. The best way to treat the solidified emulsion is to extract the silver, and send it to the refiner.—Syntax.

Toning Difficulty.—W. Halliday writes: "My experience is similar to that of 'Redgauntlet' in the matter of the loss of toning power in preserved albumen paper. I am strongly of opinion that, although it is easy to prepare a sensitised paper that will keep perfectly colourless for several months—properly stored, of course—and will then print to a rich, good colour, there has yet to be discovered a method by which the original toning powers are preserved. Some years back, before the advent of gelatino-chloride, I was greatly troubled in this direction, as my practice was, as an amateur, to make a few prints as opportunity occurred, and to allow them to accumulate until I had a sufficient number to tone and finish. Sometimes a portion of the batch toned might be weeks old, while others were perhaps on new paper, and the results were anything but satisfying, either in uniformity or quality. I set to work experimenting with a view of 'preserving' my own paper, but I was forced to the conclusion above recorded, after trying a great number of methods and preservatives. Paper only a week old, when compared with freshly sensitised (and preserved), a new bath and precisely similar conditions being observed in both cases, showed a distinct difference in behaviour, and this steadily increased with time. A slight, or even a very marked, discolouration in keeping is of little consequence, as this will generally disappear in toning and fixing, but the toning qualities of the paper are of the utmost importance. I should not like to lay it down as an absolute fact, but I am inclined to believe that papers which do change colour slightly tone better than those that keep quite colourless. If this be really so, it would be well if the makers would pay a little less attention to the *appearance* of the paper and more to its toning properties."

Our Editorial Table.

Les Rayons X.

By Ch.-Ed. Guillaume. Paris: Gauthier-Villars et Fils.

Dr. Guillaume's work is probably the completest that has yet appeared on the subject of the New Photography. In the first and second parts, light and many of its properties, electrolysis, and the varied phenomena of electrical discharges, are fully surveyed by way of introduction to the main theme of the book, which concerns itself with what has been done and discovered since the publication of Professor Röntgen's paper. Prominence is given to the recorded experiments of Continental workers, most of which we have noticed; but possibly the references to what has been done by experimentalists in this country might have been more numerous. The book, nevertheless, is very comprehensive.

Notes on Aluminium and its Alloys.

London: The British Aluminium Company, 9, Victoria-street, S.W.

The history, physical and chemical properties, working particulars of melting and casting, forging, rolling, annealing, hardening, and other manipulations of metallic aluminium, are clearly detailed in this pamphlet of forty-two pages. It abounds in useful information regarding that most interesting of metals, which plays a by no means small part in the manufacture of photographic apparatus. The pamphlet is sent free, and is well worth sending for.

Velo-fylma.

F. R. Hinkins, Royston, Herts.

Velo-fylma is a quick-drying lac varnish for cold application to films, negatives, slides, or prints. It is recommended to apply it with a camel's-hair brush moderately charged with the liquid. So used, it answers extremely well, and dries rapidly. It is capable of being employed for a variety of purposes where a quick-drying varnish is a desideratum, and appears to have been carefully prepared, "no acid, alkali, minerals, celluloid, indiarubber, or borax," entering into its composition. Mr. Fallowfield is the wholesale agent.

Photography for Artists.

By Hector Maclean. Bradford: Percy Lund & Co.

The sub-title of Mr. Maclean's book indicates its scope. It essays to give "brief and useful information respecting the many uses of photography in various walks of the pictorial and allied arts." We may say at once that the information is well calculated to be of help to those for whom it is intended. A preliminary chapter discusses the great extent to which photography is availed of by artists, and is followed by one which very fully enumerates the classes of pictorial art in which photography is useful for supplying studies. Somewhat argumentative chapters on photographic falsities, from the point of view of an artist, and the photographic misrepresentation of tones, are included, but the photographic information for the guidance of artists taking up the camera has been well and judiciously selected. Notes on reproduction processes, the preparation of illustrations for reproduction, and a very valuable condensed list of photographers of whom photographs for artists may be obtained, add special utility to the book, which is full of sound hints and advice to artists employing photography. There are a number of explanatory illustrations.

Catalogues Received.

List of Stereoscopic Views.

A. Seaman & Sons, Chesterfield.

We preserve a soft corner in our heart for stereoscopic work, and are glad to receive Messrs. Seaman's list, which deals with about 1400 subjects of well-known spots of picturesqueness in London and various parts of the country.

William Hume, 1, Lothian-street, Edinburgh.

Mr. Hume's catalogue is a well-compiled publication. He caters specially for Röntgen ray work, thereby showing his enterprise, listing complete experimental outfits from 4*l.* to 37*l.* 5*s.*, and all the other accessories demanded by the New Photography. The remainder of the catalogue concerns itself with a lavish selection of photographic apparatus of all kinds, and prominence is accorded to the well-known cantilever enlarging system, which is Mr. Hume's speciality. This catalogue is the compilation of a man who thoroughly knows his business.

Half-tone on the American Basis.

By W. Cronenberg. Bradford: Percy Lund & Co.

The translation of this book, from the German, has been entrusted to the competent care of Mr. Gamble, and the result is a clear and fairly complete treatise on half-tone work, as it is said to be practised in America. The differences between the English and the American bases do not appear to be vital; but the work strikes us as being especially valuable on account of the fulness with which it treats of the apparatus employed, in which respect it has the advantage of other books on half-tone that we have read.

The Barnet Extra-rapid Cut Films.

Elliott & Son, Barnet, N.

There appears on the part of the makers of sensitive preparations a determination to give celluloid, as a support for the film of gelatino-bromide, every chance of securing a permanent share of photographic patronage. Messrs. Elliott, of Barnet, are laudably striving towards this end, and, judging by the sample of their Extra-rapid Films we have just tried, they are in a fair way to reach it. These films remain quite flat in an ordinary dark slide; they are very rapid without being unmanageably so, and the quality of the developed deposit is singularly fine and bright. Altogether a well and carefully prepared film.

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, Tuesday, May 26, at eight p.m. *Apparatus for Photography on Small Plates (smaller than Quarter-plates).*

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, May 27. Mr. Frank Haes will demonstrate the *Daguerreotype Process.* Visitors will be welcome.

SOLDERS FOR GLASS.—The *Pottery Gazette* describes several metallic solders for glass, proposed by Mr. Charles Margot. The first is an alloy composed of ninety-five parts of tin and five of zinc, which melts at 200°, and becomes firmly adherent to glass. Moreover, it is unalterable, and possesses a beautiful metallic lustre. Another alloy, for the same purpose, is composed of ninety parts of tin and ten of aluminium, melts at 390°, is strongly soldered to glass, and is posseased of a very stable brilliancy. With these two alloys it is declared to be possible to solder glass as easily as to solder two pieces of metal. The operation is as follows: The two pieces of glass to be soldered can either be heated in a furnace, and their surfaces rubbed with a rod of the solder, when the alloy, as it flows, can be evenly distributed with a tampon of paper or a strip of aluminium, or an ordinary soldering-iron can be used for melting the solder. In either case, it only remains to unite the two pieces of glass, and press them strongly against each other, and allow them to cool slowly.

SOLIDIFIED GELATINE.—Gelatine possesses the curious property of becoming insoluble in contact with formic aldehyde, and, at the same time, of preserving perfect transparency. Gelatine rendered insoluble, or "petrified," to use a more appropriate term, resists water, acids, and alkalies. It resembles celluloid, but has the great advantage over the latter of not being inflammable. The gelatine used is the ordinary article found in commerce. The formic aldehyde is what is commonly called "formol," "formaline," and "tannaline." The commercial product is a forty per cent. solution of formic aldehyde in water. It is a colourless, syrupy liquid of a pungent odour. The vapour is not inflammable, and it is a powerful antiseptic. To obtain moulds of statuettes, &c., take two pounds of good white gelatine, and steep it in a quart of water for a night. The next day the whole is melted over a water bath. For delicate mouldings, the solution is diluted with a little water. The mould, which may be made of plaster, clay, or metal, having been prepared, the formic aldehyde is poured into the melted and slightly cooled gelatine. The whole is well stirred with a wooden spatula to obtain a homogeneous mixture. The latter is then poured into the mould and allowed to cool. After the object is taken from the mould, it is finished by immersing it for a few moments in a concentrated solution of formic aldehyde, or, if it is too large for immersion in the solution, its surface is painted therewith. Objects obtained with the gelatine alone are transparent, and resemble glass. However, by previously adding to the gelatine some finely sifted zinc white, mixed with a little water and alcohol, and operating in the same way, beautiful imitations of white marble may be obtained. By mixing the oxide of zinc with appropriate colours, objects of all shades may be obtained, and, by properly arranging the colours, veins, striæ, spots, &c., may likewise be produced. The solidified gelatine may be used for imitating mother-of-pearl, tortoiseshell, amber, coral, &c., and for the manufacture of toys and artificial flowers. —*Scientific American.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

May.	Name of Society.	Subject.
25	Borough Polytechnic	Excursion: Windsor and Virginia Water.
25	Croydon Microscopical	Excursion: West Hoathly. Leader, Dr. H F. Parsons.
25	Hackney	Excursion: Pullborough.
25	North Middlesex	Excursion: Billericay.
26	Hackney	*Development.* R. Beckett.
26	Royal Photographic Society	Apparatus for Photography on Small Plates (smaller than Quarter plates).
27	Photographic Club	*The Daguerreotype Process.* Frank Haes.
28	Ireland	Annual Meeting.
28	London and Provincial	*Washing Silver Prints without Running Water.* A. Haddon and F. Grundy.
28	Oldham	*Photographic Printing Processes.* T. W. Hilton.
30	Birmingham Photo. Society	Excursion: Sutton Park. Leader, W. T. Greatbatch.—Last Day for Sending in Competitive Prints for April Excursions.
30	Borough Polytechnic	Visit to British Museum.
30	Croydon Camera Club	Special Visit to the New Municipal Buildings. Leader, The President.
30	Leytonstone	Exc.: Crayford. Leader, C. Andrews.

ROYAL PHOTOGRAPHIC SOCIETY.

MAY 19,—Photo-mechanical Meeting, the Earl of Crawford, K.T., in the chair.

Mr. T. BOLAS called attention to a reference, in Robert Hunt's *Researches on Light*, to the theory of invisible radiations, and also to the experiments of Reichenbach with regard to the asserted

LUMINOSITY OF MAGNETS,

in which the effect was tried of the magnetic rays on the Daguerreotype plate.

The CHAIRMAN said Reichenbach's experiments followed those of Dr. Olynthus Gregory, of Edinburgh, the author of a work on odic force. Reichenbach ascertained that many people were able to find magnets in the dark, provided the poles were open, when a different coloured light emanated from each pole. These experiments were carried into the electro-magnetic period, when the light apparently grew considerably in height, but not much in breadth. Lord Crawford said he had made a great number of attempts to photograph these emanations, but without success, and had also found that many persons were able to indicate the precise spot upon which a magnet had been deposited in a dark room. If a magnet or a piece of rock crystal were brought near one's forehead, almost any one could feel its approach, even though the object had previously been raised to the temperature of the body. People who could see a magnet in the dark generally described its appearance as "lambent," which probably meant that it gave off a light something like that of bad fish.

Mr. BOLAS remarked that persons differed very much with regard to capability of perceiving slight radiations. Some people could, on a dark night, gather earth-worms for fish bait in consequence of the slight phosphorescence of the worms.

Mr. WILMER suggested that the discovery of a magnet in the dark might be due to some cause other than light, such as electrical radiations; but

The CHAIRMAN did not think this was the case.

Mr. SNOWDEN WARD said Mr. Brooks had made experiments with regard to the photography of magnetic radiations, and, as the subject was of considerable interest, he might be induced to read a paper thereon, and to bring his results before the Society. Mr. Ward thought that Mr. Brooks had investigated the effect of human emanations, which were said to be similar to magnetic effects.

Mr. BOLAS showed an original print of an advertisement issued by Mr. Cowderoy, of Reading, as an inset to the *Art Union Monthly Journal* of July, 1846, respecting the granting of licences to work the Talbotype process, and referring to the application of photography to many purposes to which it had since been adapted. It was arranged that the leaflet, as possessing some historical interest, should be pasted in the Society's copy of Talbot's *Pencil of Nature.*

Mr. IGNATZ HERBST had been announced to read a paper on *Photo-mechanical Methods in Austria*, but he said that since he left that country the introduction of Levy's screens had so changed the course of procedure that he did not propose to deal with that subject. He showed instead a number of negatives and blocks illustrating his method of working in London, particularly with regard to the production of

HALF-TONE ZINC BLOCKS.

So far as could be gathered from his remarks, he recommended a ground of bichromated albumen, the resist being formed of—

Ethereal extract of gamboge	20	grammes.
Turmeric	20	,,
Olive oil	10	,,
Benzole	50	,,
Heavy coal tar naphtha	20	,,
Chloroform	150	,,

He used square stops of two sizes in exposure, giving about seven minutes with a small stop and an additional minute with a larger one, the stops being inserted in such a position that their sides were across the lines of the screen. Mr. Herbert also spoke of photo-lithography in half-tone, and showed samples of Hubl's collodion emulsion for three-colour work, but we regret to say that his knowledge of the English language was not quite sufficient to enable his hearers to fully grasp the valuable information which he endeavoured to convey.

In the course of a conversation which ensued, some discussion took place upon the favourite question as to the origin of "devils," the CHAIRMAN suggesting that they might be due to the deposition upon the plate of meteoric iron in the shape of impalpable dust.

Dr. Lindsay Johnson passed round one of a series of pamphlets by himself, entitled *Observations on the Macula lutea*, containing reproductions by Mr. Herbst of micrographs of sections of the retina, the degrees of enlargement varying from fifty to 5000 diameters. From the original negatives prints had been made on Nikko paper, from which fresh negatives were made through screens of 175 lines to an inch, and prints from the blocks were very carefully made on fine paper, and pasted into the text of the pamphlet.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 14,—Mr. J. Packham in the chair.

The HON. SECRETARY passed round for signature a form of petition to the railway companies of Great Britain and Ireland, asking for a reduction in fares to photographers, which had been issued by a contemporary. With reference to the support they had promised to the Gospel Oak Photographic Society, in their appeal to the London County Council to continue their gardening operations to certain portions of Hampstead Heath, he had been advised that the best means of furthering this aim would be to pass a similar resolution, and forward same to the Council and the vestries as a separate appeal, and recommended that this be done.

A similarly worded resolution was therefore proposed by Mr. FRESHWATER, seconded by Mr. WALL, and carried unanimously.

Mr. Freshwater exhibited a shadowgraph of live frogs, which had not been chloroformed, as usually done. Exposure was complete in ten seconds.

Mr. ASHBY read a paper on

PHOTO-MICROSCOPY.

Many, he said, regarded the microscope as a mere toy, and its study a passing

enjoyment, but he knew members of the London and Provincial were not so flippant. It was an immense subject, and the application of photography to the microscope opened up a large and interesting field. Objects required very careful lighting, as in the majority of cases the light passed right through, and was not reflected, as in ordinary photography. They should be mounted as flat as possible, so as to get everything sharp. In ordinary photography the different planes are brought into focus by stopping down, but, by keeping the sections, &c., as flat as possible, the loss of light so caused is avoided. There is a temptation to use too much light, but what is necessary is an intense light under perfect control. Sunlight may be used as the illuminant, but most people are debarred from its use on account of the indispensable heliostat and expense. He found a good paraffin lamp, with round wick, all that he desired. Some people advocated the use of the edge of the wick as the source of light, but he preferred a round wick. The addition of a little camphor to the oil increases the whiteness of the light. The apparatus is simple enough, and consists of a long extension camera (that used by Mr. Ashby being of his own construction throughout), fitted with a microscope, capable of adjustment in all directions, and the lamp, all being placed on one baseboard, which folded up when out of use. He used two focussing screens, one of ground glass, and another of plain glass for fine definition, the image on the latter, however, not being visible without the aid of an eyepiece. The first and great essential is that everything should be centered perfectly, or failure would be certain. The size of the diaphragm was more or less controlled by the objective in use, and would be learned by practice. Orthochromatic plates should always be used, and should be developed rather dense. He preferred a pyro-soda developer to any other for the work. Some sections and other objects were then focussed on the ground glass and shown.

The CHAIRMAN thought the sight of the apparatus necessary, for the pursuit of this subject startled a good many, but he said it was a simple thing to get very fair pictures without the costly apparatus and beautiful degree of adjustment seen. He had found, in practice, an immense advantage in the use of a yellow screen.

Mr. FRESHWATER, referring to the photographing of opaque objects, said it was most interesting, and one got a photograph of the object itself. Light-coloured subjects were pretty easily illuminated, not absorbing much light, but with dark objects it was more difficult. He recommended the use of iris diaphragms for cutting down the light.

Mr. HODD asked if a process screen could be used for focussing?

Mr. WALL replied that the lines were too close, but one with about twenty lines to the inch would do. Speaking of Mr. Ashby's preference for a round wick, he asked if he liked it better than the edge for high-power work? He always used the edge, as he had found a loss of definition with flat or round wicks. He was in the habit of using a very large diaphragm, cutting down with coloured screens, such as signal green, or a chromate of copper liquid screen. These, however, can only be used for some subjects. One great difficulty with beginners was to know when everything was correct and in sharp focus.

Mr. ASHBY thought the light better for its yellow tint, except when using high powers, when great brilliancy is required.

Mr. FRESHWATER agreed with Mr. Wall that a number of coloured screens were very convenient.

Mr. ASHBY, in answer to a question, said his lenses were not specially corrected for photographing.

Mr. WALL had used monochromatic light a good deal, but there was a great loss of illumination, and it was somewhat expensive. For photographing, a small source of light was needed, but for examination he preferred a large quantity of light. The chromate of copper screen mentioned before cuts out the violet, but the amount rested with the thickness of the screen. He thought the binocular microscope provided for the examination of the slides infinitely better than a monocular.

A number of slides were then thrown on the lantern screen by Mr. Ashby and the Chairman, consisting of botanical and anatomical subjects, which were highly appreciated, and the Chairman also displayed some taken with low powers by the simple apparatus which he had used with much success.

PHOTOGRAPHIC CLUB.

MAY 13,—Mr. Nesbitt in the chair.

A letter was read from the Secretary of the Gospel Oak Photographic Society, inviting the Club to co-operate with it in protesting against the alterations which the London County Council is making on Hampstead Heath.

It was pointed out by Mr. WILLMER, however, that, as the Gospel Oak Society's first protest had taken place some considerable time ago, it was more than probable the Council had already made the alterations to which objections might be taken, or, in the alternative, had made such arrangements as would make protest of no practical avail.

Several of the members, however, expressed their willingness to join the Gospel Oak Society in protesting against anything done by the London County Council which would have the effect of spoiling the natural beauty of the Heath.

Mr. Lambert Matthews, who attended on behalf of the Scientific Hand Camera Company, showed an example of the Company's new scientific hand camera. This is of the twin-lens pattern, the photographer having a full-sized image of the picture he is about to photograph visible at the moment of exposure. The Company fits Wray's (or any other maker's) lenses to order, and supplies either the ordinary double backs, or a Pullman magazine back. The camera, which is of exceedingly compact design, was examined with a great deal of interest, and Mr. Matthews was thanked for showing it.

Mr. Golteur showed one of Marion's plate-separators. These are made of celluloid, and can be used for separating and holding in position in the developing dish either two quarter-plates in a half-plate dish, or four quarter-plates in a whole-plate dish. The simplicity and utility of the device is obvious.

The editor of the Club's *Transactions* drew attention to a letter from Mr. Cadett, referring to a recent editorial comment upon the published report of the Club's meetings.

Some conversation ensued, and Mr. BRIDGE added to Mr. Cadett's previous remarks upon the idiosyncrasies of pyrogallic acid as regards speed the following: He said he had recently been working a sample of pyrogallic acid, which differed from previous samples by the same maker to the extent that it only required one-half the amount of pyro to produce normal density.

Mr. W. D. WELFORD read a short paper upon the

PRODUCTION OF UNSUCCESSFUL PHOTOGRAPHS

in a manner quite his own. The paper told the members of the Club exactly how "not to do it." It was written in a sarcastic vein, and will probably appear in full in the proceedings of the Erratic Club.

MANCHESTER PHOTOGRAPHIC SOCIETY.

MAY 14,—the President (Mr. H. M. Whitefield) in the chair.

The PRESIDENT mentioned that, as the present rooms were not available for the summer meetings, the Society would hold them out of doors at some place convenient to Manchester, on the second Saturday in each month.

Mr. A. E. Casson exhibited a hand camera by Miller, which he has had made to his order. The size of plate is 5×4, and is exposed in dark slides; there is an adjustable focussing screen, enabling the camera to be used on the stand. It has a Goerz six-inch lens, Thornton-Pickard shutter, and detachable finder, the whole being most perfectly made and compact.

The business of the meeting was then proceeded with, Mr. HARRY WADE reading a paper on the

HOME PREPARATION AND MANIPULATION OF PLAIN-SURFACE SILVER PAPER.

Mr. Wade did not lay any claim to originality in regard to the preparation of the paper, which is by old formulæ revived and verified by actual experiment. Twenty years ago, every photographer made the preparation of sensitised paper his special study, and knew the theory as well as the practice of what he was using; but, in these days of trade production, photography is reduced to such extreme simplicity, that one has only to follow blindly the printed instructions to obtain certain results. But, to be able to vary these results at will, it is necessary to have at least some elementary knowledge of the materials in which we are working, and, in view of encouraging a thirst for knowledge, a few notes may not be out of place to exhume this beautiful but lost art of silver printing. Mr. Wade then gave a short description of the action of light on silver compounds, afterwards proceeding with the preparation of the paper. For small work, a smooth photographic paper, such as Saxes or Rives, is the most suitable, while, for anything above cabinet, Whatman's drawing papers are the best. Sizing and salting can be done simultaneously, the formula being—

Ammonium chloride	160 grains.
Gelatine	240 ,,
Water	20 ounces.

Immerse the paper bodily in the warm solution, then hang up to dry; a quantity can be prepared, for it keeps indefinitely. The paper is now ready for sensitising, which can either be done by brushing or floating. The strength of bath should be sixty grains to the ounce; it can either be the ammonia-nitrate bath or an acid bath, the ammonia being made up by adding ·880 ammonia to the silver solution till the precipitate first formed disappears. The paper so sensitised prints richer, but fails to keep more than a few days. The acid bath is made by adding twenty-three grains of citric acid to each ounce of solution, in which case the paper will keep for a much longer period. The paper should be floated twice, in order to leave no places unsensitised. The paper, after printing, should be well washed in several changes, in order to free it from all nitrate, and then toned in sulphocyanide, acetate, tungsate, phosphate, borax, or chalk gold bath, the combined toning and fixing as recommended for Alpha paper and platinum, and fixed, washed, and mounted as usual.

After the paper, Mr. Wade gave a complete demonstration of his method, from salting the paper to fixing the prints, in which the members were greatly interested.

Croydon Camera Club.—A party of members, in charge of Mr. Hector Maclean (the President of the Club), spent

HALF A DAY WITH MR. A. R. DRESSER,

at Springfield, on Saturday, May 16. With characteristic energy and kindness, Mr. Dresser rose from a bed of illness in order to entertain his visitors, which he did in such fashion as to give very great pleasure to those who were fortunate enough to be present. A chatty lecturette, relieved by startling anecdotes, and accompanied by demonstrations of the uses of various more or less unique pieces of apparatus, was introductory to a personally conducted tour of the house, many of the numerous art objects, curiosities, and photographs calling forth remarks from the host which were reminiscent, descriptive, or laudatory. During the afternoon, Mr. Wratten took the usual recording photograph of the Club excursion. Mr. Andrew Pringle, who happened to be present, was, *pro tem.*, elected an honorary member of the Club, and included in the group, into which Mr. Dresser took the opportunity of pouring in a number of "*Bullet*" shots.

Hackney Photographic Society.—May 12, Mr. William Rawlings presiding.—Members' work was shown by Messrs. Roofe, Westcott, and Hindsley. Mr. Cricks, of Messrs. Whittingham & Co., showed a number of very ingenious new hand cameras and accessories. The Hon. Secretary showed some examples of colour rendering by Lumière's orthochromatic plates. The principal attraction of the evening was a lantern lecture by Mr. E. T. COOMBES, entitled

A CYCLING TOUR WITH A CAMERA.

It proved to be a most interesting one, and was illustrated by some very good slides. The following particulars are to hand of the proposed excursion to Pulborough on Whit Monday: A permit has been obtained for the party to go by the 8.40 a.m. special Portsmouth train from London Bridge, London, Brighton, and South Coast Railway. To avail themselves of it, members intending to go must meet the Excursion Secretary (Mr. Dean) before passing the barrier.

North Middlesex Photographic Society.—May 11, Mr. Pither in the chair.—Mr. DEBENHAM gave a paper on

PERSPECTIVE.

He said that, among the reproaches brought against photography, that one which is perhaps the most surprising is that of rendering objects untruly as to perspective. He confined himself to dealing with linear perspective. He showed a slide in which a series of globes extended along the top the entire width, with a background of ruled squares, the globes near the corners appearing as ellipses. Although the eye never sees a globe as an ellipse, it would appear so if the eye were fixed at the point from which the photograph was taken. He also showed two slides of a man holding out one hand in front, and the other behind him, taken with a long and short-focus lens respectively. The marked difference between the size of the hands in the photo taken with the short-focus lens was very apparent. At the close of the lecture the CHAIRMAN said that the whole matter of true and false perspective in photography might be summed up by bearing in mind that the retina was a concave plane, and the plate a right plane. Among those who joined in the discussion was Mr. TILNEY, an artist, who said he knew very little about perspective, and his opinion was that the whole duty of an artist was to paint things as he sees them. You cannot see a sphere but as a sphere, because the eye has to move to see it. The eye shifts its point of sight many times a second to take in a view. Artists have nothing to fear from photography, but it has taught them a good deal.

MAY 19, Instruction Evening, Mr. H. Smith in the chair.—The HON. SECRETARY gave a demonstration on

INTENSIFICATION AND REDUCTION.

He gave various formulæ, and passed round various examples, to illustrate his remarks. He then proceeded to intensify a plate by the following formulæ:—I. Silver nitrate, 22 parts; water, 250 parts. II. Potassium bromide, 10 parts; water, 25 parts. Mix and wash precipitate of bromide of silver, and dissolve in hypo, 60 parts; water, 170 parts. Make up the whole to 450 parts. Immerse negative in this for several minutes, and place in a ferrous-oxalate developer (Wall's Dictionary). He also intensified a plate with bichloride of mercury, followed by cyanide of silver. For reduction, he used Howard Farmer's and Belitaki's formulæ, and passed round the plates for inspection. The next Instruction Evening will be on June 15, when Mr. W. J. Simpson will demonstrate silver printing and toning.

Aintree Photographic Society.—The second excursion of the season arranged by this Society took place on Saturday, May 16, to Knowsley Hall (by permission of Lord Derby). Several of the ladies were invited to inspect various rooms of the Hall, the camera men having a busy hour and a half in the grounds. About ninety plates were used upon the Hall, avenues, sundials, cattle, &c. The large trees of hawthorns and varied-coloured rhododendrons in full bloom were quite a sight. The party of thirty-nine had a most enjoyable day.

Leeds Photographic Society.—May 7, Mr. J. H. Walker (Vice-President) in the chair.—Mr. ALFRED NAYLOR (the Hon. Secretary) introduced the subject of

PAPER, STRIPPING FILM, AND CELLULOID FILM NEGATIVES,

briefly stating the reasons which induced him to take up this portable form of working, and showing between 200 and 300 negatives, taken during the last nine years, these, with three or four exceptions, having been exposed in the Eastman roller slide. Considerable interest was taken in this unique collection of negatives, which represented both local and distant work (within Great Britain), and favourable comments passed on the perfection of several of them, which were acknowledged to be equal to wet-plate negatives. At some future date Mr. Naylor proposes devoting a full evening to this subject, showing the working of the latest apparatus in connexion therewith. An Aphis hand camera, which has been forwarded for inspection, was very favourably received.

Oxford Camera Club.—May 11.—After some arrangements for an Exhibition to be held in the autumn had been discussed, the decision being postponed till next meeting, a demonstration of

PLATINOTYPE

was given by Mr. T. H. STRINGER, of the Platinotype Company. The whole process was thoroughly illustrated, and its advantages pointed out, both as to artistic effect and permanency. As showing permanency, the lecturer mentioned a case of platinotype prints undamaged after three weeks under sea water in a sunken ship. The lecturer also showed how, especially in large prints, development could be done with perfect success by means of a brush, if development were restrained by the addition of glycerine. By rubbing certain parts with pure glycerine they could be kept back, while others, if desired, could be brought up quickly by unrestrained developer. A very hearty vote of thanks to Mr. Stringer was passed by acclamation, the audience, though not large, having been very much interested, and much admiring the ease of the process and beauty of the results obtained.

"COSMOS" AND MR. FRY.

WE are sorry that in the JOURNAL of last week, under the heading "Jottings," the authorship of some paragraphs (that had appeared in a contemporary) signed "Major Kone," was erroneously attributed to Mr. S. Herbert Fry, who denies identity with, or knowledge of, the writer. Mr. Fry further complains of the term "slipshod" being applied to his trading, and we hasten to say that the term was wrongly applied.

We are convinced that the references to Mr. Fry were not designed to be of a harmful or offensive nature, but we are sorry they were allowed to appear, and, in taking this, the earliest, opportunity of giving publicity to Mr. Fry's denial and protest, we desire to add that, in unreservedly accepting his statement, we regret the insertion, and offer him our sincere apology for the mistaken introduction of his name.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

BROMIDE PAPER FOR NEGATIVES.

To the EDITORS.

GENTLEMEN,—Last year there were several letters and articles in the JOURNAL *re* paper negatives, and doubtless many of your readers, on seeing that Messrs. Wellington were about to introduce a paper for this purpose supposed that this demand was to be supplied. But, although, doubtless, very good as far as quality and convenience goes, the article this firm introduced is not at all what was wanted.

The principal reason paper negatives were advocated was the reduction in cost. 12 × 10 bromide paper sells at 4*s.* per dozen, and what was required was a negative paper at same price. Why should it not be supplied? Why should a positive paper be 4*s.*, a negative 14*s.* per dozen? If it could be, many amateurs would work it in a home-made camera, with a "pinhole" lens, which would give fair definition for that size picture. Further, would it not be possible, by using a chocolate-coloured paper and whitening the image with mercury, to produce a "positive" ready for framing?

Another item: Some months ago a correspondent from India, I believe, offered to communicate a method of stripping P.O.P. on to glass, or any other material required; if he would send same, I, for one, should feel obliged, doubtless many others.—I am, yours, &c., W. R. F.

FLUORESCENCE OF GELATINE DRY PLATES.

To the EDITORS.

GENTLEMEN,—When experimenting with X rays on the 11th inst., I found that a Paget XXXXX plate was markedly fluorescent to the rays. I was able to see clearly coins in a purse, nails in wood, and, faintly, the bones of my hands and fingers when placed between the tube and the plate with the film side of plate towards the tube, and all external light absolutely excluded. As this opened up what was to me a new line of experiment, I tried several experiments, unsuccessfully at first, but afterwards successfully, to find if fluorescence was visible with plain glass. On ground glass fluorescence was quite visible, and, although faintly, I saw it on ordinary lantern-slide covers. When I scraped a portion of the film off a Paget XXXXX plate or an Ilford plate, although the fluorescence was very much more decided on the coated portion, I could still see the coins in a purse on the clear glass portion when interposed between the tube and the negative.

I am satisfied that fluorescence of the sensitive film as well as of the glass takes place, but I have not had time to verify the experiments I wished to carry out, owing to the failure of two tubes, one after another, which I was working with.

I found a red half-plate vignetting glass with clear portion in the centre fluoresced all over when the red coloured side was towards the tube; but, when the red side was towards me, only the central clear portion fluoresced, indicating that the fluorescence was on the side towards the tube, and that the red glass, when next myself, cut off the luminous effect, except in the centre. A piece of ordinary red glass acted the same way, viz, one side fluoresced and the other did not. I failed to detect visible fluorescence with celluloid films or bromide paper, and I found that most crystals, when deposited on only a lantern slide cover, increased the visible fluorescent effect, such, for instance, as bromide of ammonium and pyrogallic acid. When the latter was put on a white card I could detect no fluorescence, and came to the conclusion that the crystals were increasing the visible fluorescence by providing the glass with a white reflecting background. I found ordinary luminous paint on a card makes a very fair screen, but not nearly so bright as scheelite or potassium or barium platino-cyanide.

I am aware that the appearance which some plates are said to present of the image coming up from the back of the plate during development has led some people to infer that the action of the X rays is at the back of the film. I have developed many X ray photographs, and have not found the image come up from the back on Paget XXXXX plates, which I generally use, and I hope some of your correspondents will repeat and extend the experiments which I have referred to, as the subject is one on which some light may be obtained by experiments in this direction.—I am, yours, &c., W. P. WALKER.

Glenbanna, Laurencetown, Co. Down, May 16, 1896.

BRADFORD PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—As a good example of the kind of report a piqued Secretary can write, the report published in your paper of May 8 would be bad to beat. The official mostly alluded to was the person who started the Society, and who retired because of the attitude taken up by the Secretary, and who was the "knowing member" alluded to by your

correspondent. The said "knowing one" has been the means of exposing two or three pieces of very sharp practice in the affairs of the Society, and in a small circle of the Committee was rather "loved" a long way off. He treated the members to a short speech touching the affairs of other societies, and he finally "dried up" when he had got all his rules passed and what he desired, and was then elected a Vice-President by the meeting. This is very contrary to the impression that would be created by a stranger reading the report, and it seems a great pity that a Secretary should so have reported the proceedings.—I am, yours, &c.,

May 18, 1896. A MEMBER OF THE LATE COMMITTEE.

P.S.—Nearly all the new Committee were elected from the co-called opposition party.

CARDIFF PHOTOGRAPHIC EXHIBITION.

To the EDITORS.

GENTLEMEN, — As an old photographer, I should like to say a few words concerning the management of the Photographic Exhibition now being held at Cardiff. On the occasion of my visit, passing through the large hall of the Maritime Section, I came across the exhibit of a great engineering firm from the north. The manager of the same, recognising me as one who had done a deal of work for them in past years, suggested that I should photograph their exhibit. Judge of my surprise on finding, that the right to photograph was vested in the local Society (almost essentially an amateur one) who are also running a portrait studio in the grounds, and thus entering into direct opposition to the professional photographer.

I should imagine that, in the future, members of the photographic profession will be very chary of supporting any Exhibition produced "under the auspices of the Cardiff Photographic Society."—*Vide* ADVERTISEMENT.—I am, yours, &c., THE KAISER.

Cardiff, May 18, 1896.

To the EDITORS.

GENTLEMEN,—In your report of the Photographic Section of our Cardiff Fine Art and Industrial Exhibition you do not appear to have ascertained the fact that it was not all glory that these few members of the Photographic Society were working so hard for, they having formed themselves into a syndicate to work two studios in the Exhibition, also the right of photographing exhibits—concessions granted to them by the Executive Committee of the Fine Art and Industrial Exhibition for getting together the Photographic Exhibition; also, as far as I can understand, 1*s.* on each season ticket, the holder of which has to have a portrait on the inside. There has been up to now nearly 3000 issued. The amateurs are certainly up and doing. Professionals will have to look alive.—I am, yours, &c.,

12, *Duke-street, Cardiff, May* 12, 1896. ALFRED FREKE.

MONS. JARCHY'S BABY SHOW.

To the EDITORS.

GENTLEMEN,—As Mons. Jarchy of Union-road, Rotherhithe, seems anxious to satisfy me as to when the Baby Show and prizes are to be awarded, I herewith take the pleasure of appending my name and address. I should also like Mons. Jarchy not to send any reply to my address, same as he did once before, but reply in a straightforward manner through your JOURNAL, so that the public may have some idea of when the nicest-looking babies are going to be brought before the competent Judge and Jury, and medals pinned on their dress.—I am, yours, &c.,

62, *Eugenia-road, Rotherhithe, S.E.* W. H. HILL.

To the EDITORS.

GENTLEMEN,—You were good enough to forward me a letter addressed to me, under your care, by Mons. Jarchy; possibly you may deem it interesting enough for publication.—I am, yours, &c., COSMOS.

London, May 19, 1896.

45, *Union-road, Rotherhithe, London, S.E.*

To MR. COSMOS. *May* 17, 1896.

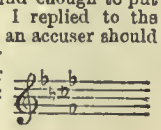
DEAR SIR,—I was highly delighted to read in the last week's "Jottings" your very witty note comparing me with C. J. Rhodes, Esq. I hope, Mr. Cosmos, it is not intended as a compliment, as, truly, I should very much like to be in his shoes.

What surprised me is that my letter adressed to the *concealed individual* has been answered by you, and in a rather irritable and sarcastic manner!

In fact, it is strange for a Son of Momus to be partial or get angry with me who never adressed you a word and whom you never saw. And you leave the part of a neutral and impartial judge of facts in associating yourself with the man behind the coulisse. It looks to me too personal. "Est-ce vrai?"

Now, Mr. Cosmos, let us come to an understanding:

A note appeared in the "Ex Cathedâ" a fortnight or so ago, where a complaint has been mentioned from a South East correspondent for not carrying out my promise of a Baby Show, etc., etc. And you were kind enough to put your paper at my disposal to satisfie your correspondent. I replied to the worthy correspondent, inviting him to divilgue his name as an accuser should do. "En plus," I threw my glove to his face, to which any gentleman would reply, but, instead, he coyly applied for your protection. Thanks to the X rayes, I can see his epistle: and Ora pro Nobis."



"Fi donc!" Why should he be afraid to face the music and come up to the area of a fair battle? I am a son of Mars, and defy any sneaky quet-a-pens! What, is he afraid perhaps for a law suit—is it so?

I can promis you, Mr. Cosmos, that you will find very piquant material for your "Jottlogs," to last a year, if you will suggest your correspondent to disguise his masque.

I am very proud you detected in me a refined scruple. I was told so several times, and it is very hard to make me bite the halt.

So come, Mr. South correspondent, for the credit and glory of the spying industry, and show to our photographic world where you are, and what is it you wish from me. Or I may get another name in the life dictionnary in the form of a more stronger glove, perhaps, that will intimidate your appearence. "Je dis ce que je pense." I remain, yours, respectfully,

A. L. JARCHY.

ASSISTANTS AND THEIR GRIEVANCES.

To the EDITORS.

GENTLEMEN,—Your leading article of May 15 on the above subject should cause assistants to seriously consider their position, and, by coming forward to join the National Union of Shop Assistants, give proof that they have taken the sound advice you tender. Your remarks on the over-stocked state of the photographic labour market must be confirmed by all, though some may not agree with your deduction that it is due to the "little learning" now required in comparison with the days of collodion. My own opinion is that this excess of labour is caused by the rise of the specialist, the abuse of the apprentice system, and the facilities now offered for acquiring an insight into photography apart from the workshop. Photography has developed to such an extent since the wet-plate days that no man can possibly become an adept in all branches. The specialist is therefore a painful necessity. This change enables many to enter the trade who have a knowledge of only one minor part and have not the capacity to undertake highly skilled work. The trade is thus thrown open to a larger and inferior body of men. Going back, in my own experience of twenty years, I am compelled to admit that the average photographic worker of to-day is much the inferior of the man of that period. In spite, however, of the specialist with his "little learning," I think that skilled men are still in demand, but are not supplied. Take printing. A printer is now expected to work at least four different processes—albumen, gelatine, platinum, and carbon. In my wet-plate days the majority were content with Rive and Saxe albumen papers. I was lately told by an employer that, out of twenty-two applicants for a post as a printer, only two could fulfil these requirements, and he engaged and paid one of them double the salary asked by the remainder. "The rest," he added, with a sneer, "were Polytechnic photographers." This phrase, "Polytechnic photographer," has given me cause for reflection. It indicates clearly one cause of the over-stocking, and, when combined with the specialist and the bad training of apprentices, accounts in large measure for the great numbers of inefficient workmen clamouring for employment. Skill and wide knowledge are still in demand, but "little learning" and the consequent over-stocking carry the day, because, as I have often pointed out before, the photographic worker will not organize to protect himself. A well-organized trade is not likely to be over-stocked, because its members can regulate the number of apprentices, keep up a high standard of efficiency, and in other ways make it difficult for those to practise the trade who have not had a practical training in the workshop.

Your statement that, photography being unlike the mechanical trades, the rate of wages cannot be regulated, seems open to question. Photography cannot be said to be less mechanical than lithography, yet the Union of Lithographic Artists, Designers, Writers, Draughtsmen, and Copperplate and Wood-engravers is a most flourishing society, and easily meets the wages question. All the regulation of wages desired is to fix a minimum rate for each branch. For instance, in photography this minimum might be fixed at 30*s.* for operators; but obviously this does not prevent a member from taking 5*l.* It must not be supposed that a Union would fix the minimum wage at 5*l.* when the average rate is only 30*s.* The rate is fixed, not from abstract principles of what ought to be paid, but by what is practically paid at the time by the fairest employers in the district. Thus, to pay spotters 12*s.* when 15*s.* is the wage paid by fair employers is a proceeding which a Union would oppose and would take means to protect its members against.

"Cosmos" states that those who are satisfied with their position will not join a Union. Experience proves that these are just the persons who do join Unions, not to improve their position, but to secure and maintain it. In fact, they are the backbone of every Union. It is the combination of the best workmen which gives the power to trade unionism that it exercises, and, the more uncertain and unstable the position of a workman, the more difficult it is to form any combination. Once organize the best workers, and the condition of all in the trade improves, even of those who have only a week between them and starvation; for it compels those who are not sufficiently skilled to demand the minimum wage to come up to that standard or quit the trade.

I again urge photographic assistants to join the National Union of Shop Assistants, 55 and 56, Chancery-lane, London, and combine for mutual protection.—I am, yours, &c., JOHN A. RANDALL.

18, *Canbury Park-road, Kingston-on-Thames.*

Patent News.

The following applications for Patents were made between May 6 and 13, 1896:—

Camera and Surveyor's Level.—No. 9493. "A Combined Photographic Camera and Surveyor's Level." E. Wood.

Burnishers.—No. 9510. "Improvements in or relating to Photographic Burnishers." Complete Specification. G. C. W. Gennert.

Wall Bracket for Photographs.—No. 9781. "An Improved Wall Bracket for Holding Photographs and other Pictures." W. J. Robinson.

Dish.—No. 9792. "A New Dish for Photographic and other Purposes." W. S. Wain.

Printing Frames.—No. 9799. "Improvements in Photographic Printing Frames." E. Marlow, jun., and T. Marlow.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

Photographs Registered:—

J. Ellis, 332, Great Alfred-street, Nottingham.—*Photograph of Bendigo, Champion of England.*

William Thompson, 126, Sydney-grove, Newcastle-on-Tyne.—*Photograph of Miss Menzies as "Galatea."*

Arthur Simmons, 25½, Westminster Bridge-road, S.E.—*Photograph of group of members of the Terriers' Association and friends.*

The Collodion Emulsion Company.—Optics. We have written the Company.

Defaulting Manager of Branch.—T. Hammond. Place the matter in the hands of the police at once.

Toning Solutions for Gelatino-chloride Paper.—A. C. H. Bell. The sulphocyanide toning bath you quote will suit all the papers named. Fix in a plain hypo solution.

Want of Sharpness.—M. Ferris. The print shows no fault in the lens; the lack of sharpness is due to movement of the camera during exposure. The image is doubled throughout.

Yellow Prints.—Hertford. The yellowness is due to the use of stale paper. If the paper has become yellow before it is printed, white prints must not be expected. There is no remedy with such discoloured paper.

Exposures—Ball and Trioger.—F. Tate. Opinions are divided on the subject, but the general opinion seems to be in favour of the pneumatic ball for stand cameras, and triggers or similar arrangements for hand cameras.

Printing.—S. E. K. J. If you depart entirely from the formula supplied with the paper, as you have done completely, it is not surprising that you do not get good results. In such circumstances it would be manifestly ridiculous to complain of the paper.

Developer.—C. Hardman. Distilled water is not necessary for the developer, though it is preferable. Failing a supply of distilled water, water that has been boiled for a time should be used. Boiled water is what is generally used for making the developing solution.

Damaged Roller.—Collotype. If the leather has several cuts upon it from the edges of the glass plates, there is no help for it but to have the roller re-covered. Why were the edges of the plates not ground, as is usually done, before using them? All instructions are to that effect.

X. Rays.—W. A. R. The print sent is interesting, but it is not anything like so good as those now made with the improved tubes, and a good induction coil. Influence machines, such as the Wimshurst, can be used, as your example shows, but in a damp atmosphere, such as we generally get in this country, they are very uncertain in action.

Stained Negative.—Cloudy. The stain is due to the liberation of sulphur in the film. After the treatment the negative has been subjected to, we suspect the stain cannot be removed. You say you are "afraid the stain will interfere with the printing." Why not try a print and see if it does? We should doubt it, except that it will require more time.

Bad Hyposulphite.—R. C. B. says: "I have bought fourteen pounds of hyposulphite of soda of a druggist here, who has gone in for cheap photographic goods and chemicals, the cheapness of which is made a feature of. After I had had the stuff a few days, it got quite wet, and the bag fell to pieces. It also has an unpleasant smell, quite unlike any I have had before. Some of the crystals are also yellow. Will it have any harmful effect on prints fixed with it?"—It is evidently a very impure article and unfit for photographic purposes. We should not think of using such a sample ourselves.

Wet Collodion.—T. Childes. The developers, whether iron or pyro, as used for gelatine plates, cannot be used for wet collodion. The formulæ, both for the developer and the intensifying solutions, are quite correct. Persevere, and you will succeed in the end.

Spots on Negatives.—J. Landor writes: "Will you have the goodness to examine negative I send herewith. You will find it has a number of brown spots dotted here and there over the film, and it is on the subject of these spots that I ask your advice. I have suffered with this photographic measles for about eighteen months now, and have tried everything I can think of to prevent their appearance. I notice them more particularly when a fresh fixing bath is made up."—The spots are caused by the presence of iron in the water or in the hypo. If fresh samples of both are used, the spots will doubtless not appear.

Lens for Hand Camera.—J. Wade says: "I have a hand camera fitted with a lens of five and a half inches focus, but it does not include, on the quarter-plate so wide an angle as I should like to take in the pictures. I think of having another lens of three inches and three-quarters focus. Would that not take in a much wider angle of view, and be equally as quick as the other, as both are said to work at *f*-8?"—Yes. The shorter-focus lens would include a much wider angle than the other, and it will be equal to it in rapidity, but it must not be expected to cover the quarter-plate with the same aperture as the longer-focus one. It will require stopping down considerably to do the work properly: then it will become necessarily a slow lens.

Sensitising Bath.—One in Difficulty says: "1. I have had some trouble with my nitrate of silver bath, which I use for sensitising albumen paper on, lately, and which I keep up to about 60° by the argentometer. I have got it too alkaline, and I wish to know what to use to acidify it with. As it is, it will not alter blue litmus paper. 2. I have been troubled by the paper not keeping well after being sensitised; it has not been fit to use the day after being floated, as it has gone so yellow when printing. 3. What effect would a few drops of ammonia have if dropped in the nitrate bath?"—In reply: 1. Add nitric acid till blue litmus paper is changed to red. 2. The acid will cause the paper to keep better. 3. Precipitate oxide of silver, and make the bath alkaline.

Blacking Dark Slides and Stops.—E. P. says: "I have some dark slides. The black of the metal plate is flaking off. Can you tell me what to coat it with to stop it, or reblack? How much bichloride of platinum to the ounce of water would be required to black a set of 7×5 rapid rectilinear lens stops? You gave a diluted solution. I do not want to buy a quantity if a few grains will be sufficient."—Clean off the old black from the slides, and reblack with dilute shellac varnish, to which some lamp-black is added. No actual proportions can be given, as the varnish varies in consistency. After the black is added, the varnish should be diluted with spirit until the costing dries dead. With too little spirit, the work will dry glossy; with too much, it will rub off. For the stops, the strength of the platinum solution is not very important. Twenty or thirty grains to the ounce of water will answer.

Salary.—Bob asks: "Will you kindly give me your advice on the following matter? I was apprenticed to a photographic enlarger for three years. The wage was 2*s.* 6*d.* per week for first year, 3*s.* 6*d.* for the second, and 5*s.* for third year. I have now only a week or two to wait, and I shall be out of my apprenticeship. I can enlarge well, copy well, and finish in black and white, although I do no finishing for the firm; I can also do trade printing. I have been asked to stay with the firm, but no scale of wages has been mentioned. Could you advise me what wage I ought to have? I may say that I am only seventeen years of age. Should feel obliged if you will assist me in this matter."—If our correspondent is proficient in all the things he mentions, he should command a salary of 1*l.* 5*s.* to 1*l.* 10*s.* a week; if highly proficient, more. Of course, salaries are always dependent upon the degree of proficiency, *i.e.*, the quality of the work produced.

Sensitising Paper.—W. W. Gregory says: "I should feel extremely obliged to you if you would give me the information I seek below. I am going in for home sensitising again, and it is such a long time since I did any sensitising that I forget how to keep up the normal strength of the silver bath. Can you give me a few particulars as to the use of the argentometer, and how should the strength be added? Is there not some multiplying business to do with it?"—The argentometer registers the strength of the bath in grains to the ounce of solution, and no after-calculations are required. As the bath gets weaker by use, so must its strength be made up by the addition of a strong solution of nitrate of silver. The argentometer only registers the specific gravity of the solution, whatever may be in it, therefore it is not an *absolute* register of the strength; but, in the case of the sensitising bath for paper, it is near enough for all practical purposes.

Copyright.—Birmingham writes: "Kindly inform me if I can copyright a photograph under the following conditions: A cycle agent asked me to photograph his stores. No terms whatever were come to. I did it, and submitted a proof. He approved of the photograph, but changed his mind about advertising with photographs, as he at first intended, whereupon I offered to take a bicycle if he gave a good order. He then ordered sufficient photographs for a large number of villages, and I had to pay him a balance only of a few pence for the bicycle. Finding the advertisement so successful, he has sent one of the photographs to have machine prints done from them, and, of course, don't want my hand-made prints. It seems to me scarcely straightforward, but I fear I am helpless to stop him. Your opinion will very much oblige."—You certainly cannot copyright the photograph. You were paid for taking it, if not in money, in money's worth. We scarcely see that you have anything to complain of in the transaction.

*** Several answers to correspondents and other communications unavoidably held over.

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EX CATHEDRÂ.

Characterised by the unvarying care with which all the publications of Messrs. Kelly & Co. are produced, the eighth edition of the *Chemists' and Druggists' Directory* has just been issued. The first edition was published in the year 1870. The work includes the names of manufacturing chemists, wholesale druggists, drysalters, patent-medicine vendors, and other trades connected therewith, in England, Scotland, and Wales, and most of the principal towns in Ireland. It extends to over 800 pages, and its value to those for whose immediate information it has been compiled must be very great.

* * *

Photography is, of course, connected with the chemical and drug trades, and it may not be generally known that the *Directory* we have under review also includes a list of photographers, dealers, manufacturers, and others whose businesses may be said to be directly connected with photography. We turn over the pages of the book, and observe that the photographer and the photographic dealer are mentioned, whenever necessary, with the same minuteness and particularity as the chemist, the veterinary surgeon, the vermin-destroyer, the dentist, or the mineral-water maker. The book is sectioned off into a "List of Places," "London," "Country Trades," and "Ireland."

* * *

There appear to be, according to a hasty calculation we have made from the lists in the *Directory*, about 3000 professional photographers in England, Scotland, and Wales. In the principal towns of Ireland there are only about 100 photographers. London has about 400. We well remember some ten years ago going through an edition of this *Directory* published at about that time, and adding up the number of professional photographers as then given. Our impression is that the numbers we then obtained were nearly those that appear in the 1896 edition of this *Directory*. If this be the case, then professional photography has not expanded during the decade. On the other hand, the growth of photo-mechanical work has been very great; while the spread of the amateur—and may we add the pro-amateur?—has gone on unceasingly.

* * *

In our Correspondence columns we insert a letter from Mr. Holliday, Photographer, Alton, asking our assistance in tracing a man who appears, when sent out to do some photographic work, to have decamped with his employer's apparatus. We trust that the publicity we are giving to the matter may help our correspondent to recover his apparatus and bring the offending individual to justice. It is with regret we allude to the fact that this is the third case of its kind that has been brought under our notice in the course of the last few weeks.

* * *

Our suggestion that Norwich would form an excellent centre for next year's Convention, if the local photographers would form themselves into a small committee to undertake the necessary arrangements, has brought us a letter from Mr. R. W. Howes, photographer, of East Dereham, Norfolk, who gives it as his opinion that the local photographers would be willing to adopt our suggestion. We are much obliged to our correspondent, and trust that the Council of the Convention will take due note of the circumstance. In the meantime, possibly others of our readers have ideas on the subject of next year's meeting of the Convention which they might care to publish through our columns.

From some introductory remarks to Mr. Wilhelm Cronenberg's book, *Half-tone on the American Basis*, we learn that the following are the average wages earned by some of the workers employed in an engraving establishment in New York; exceptional salaries, of course, are not referred to. A capable half-tone photographer earns from 5*l.* to. 7*l.* a week; a line photographer 2*l.* 10*s.* to 3*l.* 10*s.*; a printer, well up in the albumen and enamel processes, 2*l.* 10*s.* to 3*l.* 10*s.*; an etcher in line and half-tone on zinc and copper, 3*l.* to 4*l.*

* * *

The price paid for blocks, Mr. Cronenberg informs us, has dropped in the last few years very much, and the golden time in this branch belongs to the past. The average price for blocks in line is about 3½*d.* to 5½*d.* per square inch; those for half-tone, irrespective of the metal employed, 1*s.*; and for vignettes the price is 1*s.* 3*d.* per square inch.

ORDINARY DRY PLATES FOR PHOTO-MECHANICAL WORK.—I.

Now that it has been recognised that at least as good results in photo-mechanical work are to be obtained upon dry plates as were formerly supposed to be only possible with wet plates, we may expect that before long a pretty extensive choice of such plates will be upon the market. Meanwhile it would be absurd to attempt to argue that the ordinary gelatino-bromide film as prepared for portraiture or landscape work is capable of competing in their own particular line with those plates specially prepared for the use of photo-mechanical or "process" workers; nor do we intend to argue that plates prepared or treated in the manner we are about to describe will rank in point of convenience side by side with the special article.

At the same time, where the latter, from any cause, does not happen to be available, a very good substitute may be found in the ordinary portrait or landscape plate, provided the operator is willing to go to a little extra trouble in adapting it to the new purpose. Thus circumstances may arise in which the habitual user of wet plates may be almost compelled to take advantage of the far greater rapidity of the dry plate, but may not have any of the specially prepared kind on hand, though the ordinary "rapid" plates may be in stock. In such cases, at the expense of a very little trouble, the ordinary plate may be pressed into service with little, if any, loss in the quality of result, and, further than this, old and deteriorated films, if free from mechanical fault or injury, may also be converted or restored to a practically useful condition.

It is not only possible, but, we think, very probable, that the long-standing prejudice that has rested against the use of gelatino-bromide plates has been based upon a huge fallacy. The superiority of the wet plate has been attributed to its greater capability of rendering, at one and the same time, density and clearness, while the dry plate has been condemned because, although any degree of density is attainable with it, it will not at the same time give the requisite clearness and freedom from veil or deposit in the clear lines. Perhaps, in times gone by, there may have been—and, undoubtedly, there was—foundation for this charge; but at the present day there are brands of dry plates on the market—not one only, but several—which, while they exhibit a sensitiveness that was undreamt of even ten years back, give greater brilliancy, clearness, and freedom from fog, when intelligently used, than the slowest plates of a decade ago. Why, then, are they not available for photo-mechanical work?

We have not the least hesitation in saying that it is mainly, if not solely, on account of their greater rapidity, and that, if by any means collodion or albumen films could be brought to the same high pitch of sensitiveness, they would be found to be every whit as unsuited to the purpose as gelatine. In saying this, we in no way wish to revive the old controversy of rapid *versus* slow plates for general work, *i.e.*, landscape or portrait; that has, we think, been settled by the production of rapid plates—far more rapid than any that were possible in the days when the controversy arose—that for ordinary purposes, and with the exercise of very little more care, will give results in every way equal to those obtained with plates of the slower kind, which were formerly supposed to allow so much more latitude. At the time when it was argued that slow plates were the best for landscape work, we took that side of the question, because at that time it was very rarely, and then only by accident, that the quickest plates prepared were free from serious defects or weaknesses that rendered their working far more difficult and interfered with the attainment of the highest quality of result.

Now that the most rapid plates can be obtained that are quite free from the old charge of lack of quality, we base their inferiority for process work on quite different causes, in which the plates themselves are not to blame, but the conditions of working; in fact, we take it, that the want of clearness and contrast is entirely due to their excessive sensitiveness, which renders it impossible to suppress the action of reflected light in the camera, whether from the sides of the camera itself or from the black or shadow portions of the subject to be copied. In the case of collodion or of the slower gelatine plates, the sensitiveness of the films for the weaker radiations is so greatly reduced that it is not difficult to secure the contrast required; but, with the quicker plates, it is impossible to give an exposure of any length that will satisfy the requirements of density in the lights that will not also suffice to seriously impress the portions that ought to be perfectly clear.

This fact—for fact it undoubtedly is—was forcibly impressed upon us, a short time back, when making some comparative experiments in the class of work of which we are now writing. With collodion plates, both wet and dry, we were able to obtain most satisfactory results, without any greater trouble than an extended exposure; but, with dry gelatine plates of the slowest ordinary kind, it was impossible to get anything but the feeblest and most unsatisfactory images. The plates used were a brand remarkable for the density, brilliance, and absolute cleanness of image for ordinary work, and their altered behaviour, under the new circumstances, suggested that the fault lay elsewhere. On examining the inside of the camera—which was an old-fashioned wooden-bodied one—from beneath the focussing cloth, with the ground glass removed, the cause was instantly suggested. With age, the blocking of the woodwork inside had entirely lost its "dead" character, and the light, passing through the lens from the margin of the picture we were copying, fell upon the semi-polished sides, and was reflected in such a manner as to light up the interior of the camera, and remove all wonder at our failure to obtain contrast with gelatine plates.

The Late Lord Leighton's House.—The attempt to raise the sum necessary to purchase the house, and retain it, in fact, of the late President of the Royal Academy at the price fixed by the relatives has, up to the present, ended in failure, consequently the house was submitted to auction one day last week. The biddings commenced at 7000*l.*, and proceeded feebly till 12,000*l.* was reached, at which point the property was withdrawn from sale. It is quite possible that now the original scheme might be carried out for a considerably less sum than that first asked by the relatives—35,000*l.*, we think. Such large amounts are not easily raised, even to secure a miniature palace of art.

Photographic Evidence Destroyed.—Reference has frequently been made as to the value photography would be as a witness in the case of riot and disorder if it were forthcoming. It is stated that, during the rioting amongst the fishermen at Newlyn on Monday last week, photographers, presumably tourists, were noticed taking snap-shots of the extraordinary scene. They were, however, compelled forthwith by the mob to give up the plates, as they might, when developed, serve as a means of identification of the ringleaders. Evidently the wily fishermen of Newlyn are fully alive to photography, and to what purposes it may be turned. They have, doubtless, been made more familiar with this matter by the number of photographic tourists who visit this picturesque fishing village, and include portraits of its inhabitants in their pictures. Be that as it may, they clearly will not have their illegal proceedings perpetuated by photography if they know it.

A Valuable Find.—A paragraph has appeared in some of the "dailies" to the effect that another genuine Raphael has been discovered, in a village bric-à-brac shop in Burgundy, by a connoisseur, who purchased it for five francs! It is a Madonna and Child, and is said to have at one time belonged to an historic collection. After the dirty, old canvas had been cleaned in Paris, it is stated that the purchaser was offered 300,000 francs for the picture, which offer he refused. About 4*s.* for a painting worth 12,000*l.* is not a bad investment, if the paragraph be true. It would be interesting to learn how a genuine Raphael got from an historic collection into a village curio shop, also how it was that the keeper of the shop was so utterly ignorant of its value. As a rule, this class of dealers, both on the Continent and here, generally know pretty nearly the worth of the things that come into their hands, or at least they do not under-value them when selling.

Photographic Poisons.—During last week inquests were held on two suicides who ended their existence by taking chemicals used in photography, yet neither of them was in any way connected with the practice of photography. One was a jeweller, who took cyanide of potassium. The other was a builder, who swallowed a solution of bichromate of potash. This is the first case, so far as we remember, of this salt being employed for suicidal purposes, although it is in such general use in the arts, and is retailed without any restriction as regards the Pharmacy Acts. We do not either remember a case of its being taken, internally, accidentally. This is a little surprising, seeing that the bichromate is in such common use, and that its solution so closely resembles in appearance many things that are taken as medicines or as beverages. As poisoning by this salt is so rare, very little seems to be known of its actual toxicological properties. Anyhow, it may be taken that it is not a deadly poison, neither is it very rapid in its action.

The Patent Office.—The annual report of the Comptroller General of Patents, Designs, and Trade Marks has just been issued as a parliamentary paper. From it there will be seen, as we mentioned at the beginning of the year, there was no increase in the number of applications in 1895 over that of the previous year, in fact there was a decrease of over 300. This is the first time since 1885 that there has not, each year, been an increase over the previous one. Of the 25,065 applications, 591 were, it is stated, made by women, a large proportion of which were, as might be surmised, in connexion with articles of dress. It would be interesting to know how many of the total number of applications were directly, or indirectly, in connexion with photography, and what is the trade, profession, or calling, of the applicants. As we have said before, comparatively few of the photographic patents are taken out by those connected with the business. Such callings as clerk in holy orders, engineer, surgeon, "gentleman," &c., figure conspicuously, the latter especially.

The number of applications for the registration of designs also shows a decline on the previous year. The applications for the registrations of trade marks, on the other hand, show an increase of over 250. But this branch of the business is of little interest to our readers. There was, however, a marked diminution of frequenters of the library—5089 less than in 1894. The year's receipts of the Patent Office were 187,012*l.*, which gave a surplus of 86,341*l.* With such an income, the building of the present Patent Office is little less than a national disgrace.

Reduced Railway Fares.—The principal railways have made a considerable concession in the matter of reduced fares to commercial travellers. From July 1 next they will be entitled to first, second, and third-class tickets to return to their homes from Friday to Monday at single fare for the double journey to all places over thirty miles distant. This privilege will be a great convenience to the travellers, and will, no doubt, be a source of additional profit to the companies. We believe it is the custom with "commercials," when they are "on the road," and more than thirty or more miles from home, to spend the Sunday at the hotel on account of the cost of railway travelling. With the concession it will often be more economical and far more agreable to them to spend the day at home with their families. This will mean a larger amount of business to the companies, which they would otherwise not get. There are some restrictions, however, accompanying the concession beyond the minimum distance of thirty miles. In order to prevent fraud, the traveller must be a member of the Commercial Travellers' Institution or kindred body, who will have to provide him with a ticket of membership as well as forms to be filled up when applying for the railway tickets. The Association card of membership must also bear upon it a photograph of the member.

We are afraid the privilege here granted cannot be taken as a precept for granting a similar one to photographers, which so many are just now so anxious for. The cases are widely different. The commercial traveller travels on business, and usually long journeys; the photographer for pleasure, and generally short trips. The former has succeeded in showing the companies that they would gain by an increased traffic which they at present lose. This, as we mentioned last week, is what photographers will have to do, we strongly suspect, before they will attain their end.

ON THINGS IN GENERAL.

The pages of this Journal have been largely utilised, and with great propriety, in bringing forward what has been termed "photographers' assistants' grievances," possibly the most marked example being that of a well-interviewed lady photographer, who gets as many pounds a dozen for her portraits as some photographers obtain shillings. It is open to speculation whether she is the employer responsible for the wild statements so freely made a few months ago, and repeated in most of the ladies' papers, that lady retouchers readily made ten pounds a week by the exercise of their skill. If what we read is trustworthy, it would have been more correct for her to have said shillings than pounds. It is too sadly true that she is not the only one of her kind, and, unfortunately, it is true that in a large number of studios the assistants' hours are both long and laborious, to an extent that prevails in scarcely any other business or profession. The suggestion that these unfortunate victims should join the Shop Assistants' Union is a good one, for there is little of either *camaraderie* or common ground of action among them at present. But our Editor sums up the position as accurately as suc-

cinctly when he says: "At the present time there is very little to learn in photography, as compared with the wet-collodion days, to qualify any one for an appointment in a third or fourth-rate studio, and that is the root of the evil. In any profession or calling where there is but little learning required the supply of labour is sure to be greater than the demand." Precisely. And the only persons who can reasonably expect to have a living wage and over are those who have attained a proficiency that will raise them head and shoulders above their brethren. Why should a man who, after a few months' practice, has picked up a knowledge of how to make a negative and produce a print, expect to obtain as much wage as a working joiner or a bricklayer who has served an apprenticeship, and needed years of practice to get proficient in a handicraft? It is hard to say this, but it is true. A poor sempstress, the living type of under-paid skilled labour, is far more entitled to a good wage. Years of practice were needed before she could earn her seven or eight shillings a week. But money has been made by photographers, and the ranks are rushed to by a lot of incompetent men who wish to do likewise, when a whitewash brush would be more suited to their abilities.

Another well-discussed topic has been the photographing of the national pictures. It seems a very simple matter. It is an undoubted fact that a "man with a camera" is often a nuisance, and certainly would it be the case if every amateur who applied might get a permit to photograph in the public galleries; especially would he be so looked upon if, as Mr. Lambert suggested, he took several days, so that he *might* get a good one eventually. The suggestion that the average amateur would be more likely, or as likely, to get good results as a professional accustomed to the work, is very unreasonable. There are very few photographers who know how to take a good negative from a bad (as regards condition) or even a good oil painting. There has, however, been one point raised that I entirely dissent from, the danger to be anticipated from the handling, and glazing, and unglazing the paintings. Any photographer who knows his business can take just as good a negative from a glazed as an unglazed picture, so long as the interior surface of the glass is clean, and provided, of course, that he is possessed of the necessary appliances.

What an interesting revival of old memories was brought about by Mr. Atkins's paper on *Micro-photographic Reductions* at the London and Provincial Photographic Association the other day. It is nearly half a century since these curiosities were first introduced, I believe, by the late Mr. Dancer, the well-known Manchester optician, who, I think, first used the name micro-photographs. There was rather a craze at the time for making them, and somewhere among my optical lumber there is stored one of the pieces of apparatus sold at the time for the purpose of making the little slides (Mr. Dancer must have sold thousands of the Lord's Prayer, the Creed, &c.). It is somewhat after Mr. Atkins's instrument, with micrometer screw to make accurate adjustments for the difference between visual and actinic foci; but it had a little dark slide, and the "uncapping" was done in the slide itself by turning a little swivel door. The Hon. Secretary was correct in his account of how these things are done commercially by a battery of lenses. Most of the single-subject pictures, mounted on the end of a Stanhope lens, and found in commerce, were done by Dagron, who used a battery of lenses. I am able to supply further details, not generally known, of how these little things are done. The small photographs were done on one sheet of glass, cut up into small squares, and then cemented with Canada balsam to the end of the lenses. Then, when set and hard, the whole piece, lens and photograph, were turned in a lathe and made into a smooth cylinder, a method which, it will be seen, readily accounts for what is often a puzzle, the accurate fitting of photograph and lens.

Speaking of caramel at the North Middlesex meeting, a description was given of the way to make it. I think by far the best way is the plan adopted by the cook. The sugar is melted as described, but the frothing stage is allowed to be passed, and the material then becomes liquid. At this point water is deftly poured in gradually, and with much stirring. If properly done—and experience is needed—a beautiful thick syrup is obtained; if wrongly done, the result is—mess and early English.

FREE LANCE.

PHOTOGRAPHIC SOCIETIES AND PHOTOGRAPHIC ART.

[Photographic Club.]

IN what way can a Photographic Society or Club do anything for Photographic picture-making?

The answer to such a question would doubtless be, as far as some people are concerned, "by the reading and discussion of papers upon art matters." Before accepting such a reply it is necessary to consider what such papers are, and whether their publication and the discussion which sometimes follows is likely to be of any use.

The literature of the subject is very great. More than a dozen treatises have been written on it, many columns of the photographic press have been and still are devoted to it; in fact, I have seen periodicals which contained little else except the advertisements. The subject has also received attention in the circulars distributed to their customers by some west-end and provincial photographers, in forewords, or what English writers would describe as prefaces, to the catalogues of exhibitions, in an epitaph, and in other quarters too numerous to mention. Reputations of a kind in various little photographic coteries have been made by men who never exhibited a photograph, on the strength of the opinions, or what they believe to be such, embodied in their writings on photography and art. In fact, the little brook, to which the first paper read before the Royal Photographic Society might be compared, has expanded into a broad river, which, from its volume and from the mud it carries, can only be compared to the mighty Mississippi itself.

Much of this literature I have read, and, if you will bear with me a few minutes, I will give you a brief analysis of the compound, for such it is. Chemists who wish to analyse a substance the composition of which is unknown would tell you that they endeavour first to isolate it; and, applying this principle to the literature of photographic art, we must proceed to get rid of the quantity of unnecessary verbiage in which it is dissolved. Much of this art writing we find with the information or instruction, when any is present, dissolved in an ocean of words, drowned in a sea of gush. We find it accompanied with rhapsodies upon the beauty of sunlight, of mist, and so on, which are too well known to need further description. Eliminating all this foreign matter by a process akin to evaporation, we can, if we care to go on long enough and to deal with a sufficiently large quantity of solution, isolate sufficient of what may fairly be described as literature dealing with photographic art to enable us to make out its composition.

THE LITERATURE OF PHOTOGRAPHIC ART.

It will usually be found to be a compound, or rather a mechanical mixture, of some of the following:—

1. *Capital letters.*—These are very prominent and not entirely useless. It is the easiest thing in the world to pick out the "Art" papers in a photographic journal by merely turning over the leaves and observing how often capitals occur. Much time may be saved by noting this, which is what a chemist would call a characteristic reaction.

2. The next most common constituent is *praise of the writer's fellow-workers.* This is the most creditable feature of the whole thing. We have not very many constant writers on photographic art in London, but the regularity with which they praise one another, and the unstinted admiration which each obviously possesses for the other photographers in his particular clique, must strike every reader, and speaks volumes for their freedom from the jealousies to which artists are said to be particularly prone. It has been suggested by irresponsible and anonymous scribblers that this flattery is systematic, and is practically the condition for admission to the circle, but I am quite confident that there exists, in writing at least, no agreement for the interchange of fulsome adulation, such as is hinted at.

3. *Assertions that photography is art, and that everything which does not relate to art has no serious import to a photographer.*—This is usually coupled with suggestions that those who pay any regard to the scientific or technical aspects of photography can never hope to achieve any success in artistic photography. (I would here remark, in parenthesis, that the converse of this proposition, *i.e.*, that those who give any attention to artistic photography can never hope to achieve success in photographic science or technics, has never been put forward by these writers, although I should imagine it is quite as reasonable.) Under this heading would be grouped fifty or sixty controversies which have taken place at different times, which may be summarised in the following manner, eliminating first the unnecessary verbiage.

A. "Photography can never hope to be regarded as one of the fine arts"

B. "A. is a perfect fool, and knows nothing of photography."

A. "B. is a ditto, and is absolutely devoid of art knowledge."

B. "You're a liar!"

A. "Ditto!" and so on, until the editors stop it, or the gentlemen get exhausted.

4. Our fourth constituent is more technical. It consists of *statements as to the amount of focussing necessary*, and of asseverations that photographs focussed sharply, or printed on glossy-surfaced papers, or toned to a warm colour, or mounted on a white card, or having the clouds printed in, or depicting scenes in nature which are themselves "pretty," or worse, are absolutely unable to be regarded for a moment as betraying any artistic perception in their producer, or *vice versâ*, according to the views of the particular writer. Under this heading would come, of course, all writings intended to convince that all photographs should be able to able to bear examination with a magnifier, that rough printing papers are a ridiculous fad, and that painters who depict forms in other ways than a lens would do are wrong and their pictures false. The mark of this branch of the subject is its dogmatic nature, the proofs offered of each dogma taking the form of repeated assertions.

The foregoing constitute by far the greater proportion of the literature of photographic art; but this is not all. Reading carefully and continuously, one does now and again come across passages containing hints for the guidance of the serious worker, and suggestions as to what to do, and what to leave undone, to obtain the most pleasing pictures. This would seem to point to the conclusion that some of the papers might, under certain circumstances, be of use, but it is only a momentary illusion. A little care will show that every point so brought forward is to be found elsewhere. I do not deny that I have heard some of this writing described as very readable; it may be to some people, but is it in any way instructive? Of course there are some papers which both instruct and please. Dr. Emerson has written a book on the subject which would certainly come under this category, but then it deals with much besides mere photography, and has a lot of interesting information about Egypt, Dr. Emerson himself, the platinotype process, and so on

Mr. Robinson and the Royal Photographic Society.

Mr. H. P. Robinson, who has written much upon this subject, in a very recent article has repeated the charge that the Photographic Society has ceased to foster photographic art, and brings forward the statement of an Hon. Secretary of many years ago that, "although the meetings of the Society should be devoted to the scientific rather than the artistic side of our subject, an occasional paper on practical picture-making would be welcome," as a proof of his accusation. I am not here to-night to defend the Photographic Society of to-day, much less the Photographic Society of eight or ten years ago, when Mr. H. P. Robinson was one of its shining lights, or I should point out that the casual observation of one of its officers, on his own authority—an observation which the Council, on the part of the Society, distinctly repudiated, as Mr. Robinson has, I believe, admitted they did on his own initiative—cannot be taken as in any way binding the Society. But all this is beside the mark. I am simply here to give you my own opinions, as a member of the Photographic Club, on the way in which photographic clubs and societies can or cannot foster photographic art, and in that capacity I must say that the statement of the particular Hon. Secretary quoted is not an altogether unreasonable one.

In 1868 a very interesting and useful book, entitled *Pictorial Effect in Photography*, was published, which, to use the author's own modest expression, "has managed to survive." Whether the ideas put forward in that work were new or not is immaterial, but, at any rate, it has been a little gold mine to those of the subsequent writers on the subject who have recognised the importance of including at least something or other of use to the student. It is little or no exaggeration to say that, in ninety-nine hundredths of the papers which have been read, and articles which have been written, since, there will be found nothing of service which is strictly germane to the subject which is not to be found, expressed more happily in *Pictorial Effect*, or, to go still further back, in *Burnet*. What possible benefit to photographic art could accrue from the reading of a rehash of Mr. Robinson's valuable work, diluted more or less, as I have indicated, at every other meeting of every society, let us say? It is difficult to imagine. It might even have injured the sale of the book.

I would go further than this, and say, that not only does the emission of this kind of literature weary the reader, without assisting him, but I am convinced that it has a very serious moral or intellectual effect upon its writers. I will not stay now to give you many examples of my meaning; one must suffice, and I select it, not as the worst, but as coming from one who, by occupying the highest place, has most room for deterioration.

"At the end of 1894 the Photographic Society of Great Britain was wound up, and another Society founded on its ashes, which is almost entirely devoted to the science, mechanics, and trade of photography." That sentence is a quotation from one of the latest writings of a well-known photographer. I will not do more than point out the skill with which a legal formality has been described so as to deceive those unacquainted with the actual facts to believe that something quite different took place. To my mind, the penning of such a paragraph is not so much a matter for criticism as for regret—regret that one, whose work all photographers must admire, should injure himself by attaching his name to such a statement. It would be only charitable to conclude, if it were not so improbable, that for once the facile pen has failed utterly to convey the author's meaning. Whatever may be the reason for such an utterance, I can only regard it as one example of the effects which much writing on photographic art has on the performers.

Now, the question I ask is, What useful purpose could be served by the iteration and reiteration of this "art" writing? Does it lead to the acknowledgment by painters that photography is a fine art? and, if it did, what is the use of the expression of opinions formed simply by repetition, as one teaches a parrot to talk? If you ask for my own opinion, I would give it as this: That the emission of a hundred thousand pages of such matter is less convincing, using the word as referring to a reasoning process rather than a parrot lesson, than the production of a single photographic *picture*.

How can a Society Foster Photographic Art?

Neither writers, then, nor readers, are benefited by it, and we come back to our original question, How can a club or society foster photographic art? Clearly, it must be in some other way than by the reading and discussion of papers. The fact is, "Art is a matter which cannot be *profitably* discussed, talked, or written about;" a great artist has said, "It must be felt." The only *clear, definite, and constant* way in which help can be given is by affording every opportunity for the exhibition of photographs. A club may, from time to time, as occasion shall arise, help in other ways, but its duty at all times is clear in this one direction.

It can further this object by holding or assisting to hold exhibitions of the works of particular photographers, living and dead, such as have from time to time been held by the Camera Club and other institution and by the holding of periodical exhibitions in which the latest productions are on view. For this reason, then, I should like to see the system of "one-man shows" increased and extended, so as to give every photographer an opportunity of seeing what has been done by those who have gone before him; so that every worker may know where his starting-point will have to be if his work is to constitute an advance. To do this, a society meeting in London is not sufficient, but all over the country the local societies must endeavour in the same way to show their members the present position of the high-water mark, as it were, and to educate them in the one method by which it can most directly and efficiently be done. This should be particularly the case with the works of deceased photographers. I would suggest that each photographic society which has at heart the interests of photographic picture-making should form, or at least endeavour to form, a collection of the works of the mighty men of the past; such a collection will not only show what has been already achieved, but, by indicating how much we have already progressed, will help to excite in the more serious workers a conviction that much may still be done.

About Exhibitions.

As regards the open exhibitions, where the most recent work can be seen, there is much to be said. The actual rules and regulations seem to occupy much too great a space in some people's minds. As a matter of fact, all exhibition rules and regulations, other than those which refer to the matter of making the exhibition pay its way, should be framed with two main objects in view. These may be summarised by saying that, as far as possible, the exhibition should contain the best work of *every* school, and *that*, once got together, it should be displayed so that those who are likely to profit by it can see it under the most favourable circumstances. To carry out the first of these conditions, it is, above all things, necessary to convince the exhibitors that the works to which they have given their thought and care will be considered and judged, not by any particular or select few of their rival exhibitors, who will now and then admit a picture or two by some one outside their own circle, to show their impartiality, but by a body of men in whose election, if they will, they may have a voice, whose names are known and whose merits are discussed months beforehand. The minor details of such an exhibition—whether medals shall be given or not, what charges, if any, shall be made to exhibitors, whether the show itself shall be held in the same gallery as a case or so of cameras and lenses (an unpardonable offence in some eyes)—must be largely passed over here; but one point I will touch upon: It is sometimes said that an exhibition of photographic pictures should not be held in connexion with one of apparatus and other technical exhibits; this is, in my opinion, a very great mistake. The whole

aim of an exhibition is to get together the best selection of things to be seen, and then to show them to as many as possible of those interested. Many a photographer who is interested in picture-making will go to see an exhibition where he can see everything photographic that is new and attractive to him who would not feel inclined to devote a day and to take a long journey to see a collection of the works of some forty or fifty persons in one particular direction and little more. For this reason, I would say, Make your exhibitions as widely interesting as you can, provided a comfortable view of none of the various exhibits is interfered with. There can be no doubt that an exhibition representative of every phase of photography, and not of one narrow school of one particular branch of it, an exhibition commanding the confidence of the exhibitors in the Judges as quite disinterested and impartial, and one visited by thousands of photographers, is infinitely more powerful in encouraging photographic art than one which is the reverse of all these. We hear nowadays strange things about exhibitions and exhibition management. One London show is said to have done much for photographic art, as far as I can make out from the claims of its supporters, because it has succeeded in disposing of a number of photographs, more or less permanent, at prices which suggest a fancy fair. I see little to cavil at in selling photographs for what they will fetch. Many of the pictures at Pall Mall every year are disposed of to visitors, especially since the 1893 Exhibition, when means were taken to bring the fact that many of the exhibits could be purchased before the notice of the public, a hint of which the Photographic Salon availed themselves when they opened shortly afterwards. In fact, the highest price I ever heard of being given for an exhibit was paid for one at the Pall Mall 1893 or 1892 Exhibition, I forget which. It is important to remember, however, that, while this sale of pictures is, no doubt, advantageous both to the coffers of the exhibitions and to the professionals who exhibit, it has little or nothing to do with photographic art, but is more properly considered under the heading "Photography as a Business."

Under the same heading would be included an exhibition organized to advertise its promoters and exhibitors in the lay press, and to induce the outside public, if it troubles itself about such things at all, to regard these individuals as the only personages in the photographic world. A distinguished member of the "Linked Ring" once remarked to me that no small amount of the success which is supposed by some to have attended that mysterious body was owing to the skill with which the non-technical journals had been *manipulated*. I did not gather from that that anything in the nature of bribery had been or would be employed, but that advantage had been taken of friendship and acquaintances to get particular workers' photographs eulogised to an extent which would not have been done spontaneously, or by any one acquainted with photography. It did not seem to have occurred to my informant to look at the moral aspect of the question, it seemed to be regarded as perfectly blameless, and I have heard it suggested that the Royal Photographic Society should make use of its influence in a similar manner. May I venture to express the hope that neither that body nor any other photographic society will ever resort to such questionable means to attract exhibitors?

Photographers as well as Artists should be catered for.

The people for whom exhibitions are primarily intended should always be borne in mind. At Pall Mall most of the leading artists are to be seen every autumn (taking advantage of the hints for picture-making, no doubt), and I have read somewhere that a number of artists visited one of the Salon Exhibitions. I gather, however, from the fact that this was specially recorded, they do not make a practice of going to the Dudley Gallery. But why should they go there or to Pall Mall either? Let them by all means pay their shillings to such good causes, but let us not forget that it is the photographers who should be catered for first and foremost if our aim is to further photographic art. By all means get the artists and the general public to go and to buy the pictures, it is useful financially; but this should not be the aim and purpose of a photographic exhibition, nor should it be put forward as a proof of its success.

By holding exhibitions, then, on the lines I have suggested, a society can do much to foster and advance the art side of our subject. What can be done further with this aim must depend upon the times and upon other circumstances. One opinion has long forced itself upon me, and that is, that these papers upon "art," as they are called, may encourage smart writing, undoubtedly foster toadying, jealousy, and ill feelings, but without apparently bringing any commensurate benefits whatever.

One word more and I have done. From the nature of my subject, I have dealt entirely to-night with photography as an art. I hope no one will go away with the idea that I am one of those who regard this art spect of photography as the be-all and end-all of photography as photography. There are some, I believe, who hold that it is no part of a photographer's business to endeavour to perfect our processes, or to increase his individual skill in using them; that, in fact, the sole aim of a photographer should be to "paint by light," using the word "paint" in its narrowest sense, as implying the object "pictures." This is, of course, the opinion of the enthusiast, and will be echoed and re-echoed by those who are not likely to achieve success in any other direction. I know a gentleman who, I have no doubt, would maintain that the whole aim of a photographer should be to take pictures by magnesium light. Let us clear away from our minds any such narrowing prejudices. Photography is surely something wider than this. It is true that this is the particular direction in which public interest is most manifested, and that ten people will rush to see a pretty picture for every one that goes out of his way to see an example of some other form of applied photography. This is in itself an argument against the devotion of too much collective effort to encourage picture-making. The tendency nowadays often is to lose sight of the fact, none the less true in consequence, that this particular section of photographic work is but one of the many divisions of applied photography, and that it has no more claim to be the alpha and omega of the photographer than has photo-micrography, astronomical photography, or the manufacture of transparencies for the kinetic lantern. Is not this very tendency a reason for the concentration of the more powerful efforts of the societies on those branches of the craft which are suffering most from neglect, and a reason against spending too much valuable effort in fostering that which, from its very nature, is of all the sections of our subject that best able to stand alone?

R. Child Bayley.

PHOTOGRAPHIC WORKERS AT WORK.

V.—Messrs. Illingworth & Co. at Willesden Junction.

Our visits hitherto have been to works at which photographic materials of one kind or another have been made; on this occasion, however, we saw the production of photographs themselves, rather than of implements by which photographs are produced. Messrs. Illingworth & Co. have recently opened an attractive showroom at No. 5, Soho-street, where specimens of the firm's work in the shape of prints in carbon, platinum, and silver, and enlargements of all kinds are to be seen; and, after a call here, we took advantage of the excellent train service from Euston to inspect the works at which they are produced. Nominally, these are situated at Willesden Junction; actually they are at Harlesden, which is the less known, but more strictly accurate, title of the rapidly growing district in which that far-famed railway centre is located.

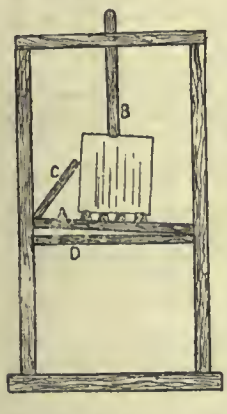
A few minutes' walk from the station brought us to the works; these are in two parts: the first an ordinary, double-fronted house, which has been adapted to the business to be carried on in it; the second, and newer, portion consisting of a series of buildings, in which the bulk of the photographic work is now done, the house having been soon outgrown.

The first department to be visited was devoted to carbon printing, and occupied a long one-storied building, divided into two parts, of which one was glazed with yellow fabric to serve as a filling room for the frames, and the other, by far the larger, portion was used for developing and finishing. In the first was to be seen a plentiful allowance of table space, such as its purpose required, together with arrangements for spotting the negatives, and carrying out those little operations of a similar nature which are needed, more or less, by every negative, in order to secure the best result possible from it. The developing room is of oblong shape; down one side of it are the squeegeeing slabs for mounting the tissue, down the other are the developing tanks. Slate slabs are employed here for squeegeeing, each slab being mounted in a wooden sink to carry off drippings. The tanks on the other side of the room are four in number, and are made of ample proportions of galvanised iron. The first is used for mounting the tissue, and is, of course, full of cold water, the second for developing, containing hot water. We noticed in this an ingenious arrangement for syphoning off the dirty water, so as to keep the tank nearly full of water, which was nothing like so dirty as is usual in carbon works, the supply coming from a boiler heated by gas, and capable of delivering twenty gallons, boiling, in twenty minutes. The other tanks contained alum and cold water respectively, and call for little notice.

In front of this building is a large yard, which, enjoying a north aspect, and sheltered from the sun by the main body of the works, is eminently suitable for the operation of printing, which is there carried out in fine weather.

Parallel with the building in which the carbon work is carried on is a large two-storied erection, the upper floor of which affords accommodation for enlarged negative-making. In a spacious dark room here, the atmo-

sphere of which was strongly flavoured with ether from the collodion, we found Mr. Samuel, a wet-plate worker of many years' standing, engaged in making enlarged negatives. The dark room was roomy, the walls covered with black waterproof paper for easy cleaning, while openings on one side of the room, each with a camera fixed in front of it, were provided for enlarging purposes. In front of these cameras ran lines of rail carrying the easels. In this case the latter, being constructed for wet plates, were mere frames, in which the plate is held as shown in our sketch. The bar, A, carries a series of wooden blocks, notched at the top, into which the plate is dropped, and B, which is similarly notched underneath, is brought down to hold the plate vertical. The latter bar, B, is made to move stiffly through the opening provided for it by means of a spring, and so no further clamp is requisite. The bottom bar, D, can with A be shifted up and down the framework to the required height, and then clamped. In case the image is not square on the negative, this bar can also have one of its ends tilted as shown, so as to incline the plate to one side or the other, and so to correct the enlarged image. No dark slide is used in this apparatus, the focussing screen being inserted into the notches in the easel, and the image centered and focussed. The arm, C, is then brought down till it touches the screen, and acts as a guide for the position of the sensitive plate, and, the lens being capped with yellow glass, the plate is substituted for the focussing screen and the exposure made.



The plates to be coated with collodion are supported either with a pneumatic holder in the case of small plates, or with large ones on a ball, and the silver bath is a horizontal one, mounted on trunnions, and containing a box for the solution at one end, so that the bath can be tipped up to remove the plate. Hypo is employed exclusively for fixing.

The wet-plate dark room occupies a considerable portion of the upper part of this building, but there is still a large room freely glazed in which enlarged negatives are made in the camera from prints, &c. An arrangement in use here struck us as being very convenient, and we give a description of it for the benefit of our readers. Every one who has done any enlarging in the camera must have experienced the inconvenience of adjusting the position of the print on the easel to that of the camera, especially when they are some little distance apart. It necessitates a considerable amount of oscillation between the easel, to adjust the picture, and the focussing screen of the camera, to see whether the adjustment has been made correctly. At Willesden, a little invention of Mr. Illingworth's obviates this altogether. The camera slides to and from the easel in guides, and can be fixed at any required distance, and between the guides and just underneath the camera are four cords. The board of the easel to carry the print or what not to be copied slides freely in two series of grooves, one vertical and the other horizontal, much in the same way as the front of the camera with rising and horizontal movements. Two of the cords pull the movable portion of the easel to the right or left, the other two pull it up or down, and its exact position can be settled in this way, while the head is under the focussing cloth and the camera at any distance from the easel. It struck us as both simple and efficient.

We now went into the ground floor of the same building. This is occupied with bromide enlarging, in which the firm do a considerable business. The arrangements for illuminating the negatives are similar to those in the wet-plate dark room, openings in the wall admitting light from a series of fluted glass mirrors. The floor here is of concrete, and the rails carrying the easels are bedded in it so as to prevent the slightest danger from vibration. The chief operator here, observed, in showing us the various operations, that the exposure required by the bromide paper was never measured with a watch, and that they but rarely went astray. This, of course, led to an inquiry as to how it was done. "I hold my finger between the lens and paper, so—" says our informant. "so that its shadow falls across the most opaque part of the negative, and, by noting the difference in the illumination of the least lit part of the enlarged image and that where no light falls upon the paper at all (the shadow of my hand), the exposure is easily estimated with a little practice." This was certainly the case in the particular instance which we saw, the print developing up brilliant, but not too hard.

Ferrous oxalate is here used exclusively for bromide paper work, with excellent results. The oxalate and iron solutions are kept in large jars fitted with a tap, from which the necessary quantities are drawn off and mixed. Glass-bottom dishes are employed, and the point at which to stop development is decided by looking through the enlargement, on the bottom of the dish, at the yellow lamp. The glass baths not only permit this examination to be done easily, but are also very economical of developer, three ounces being sufficient for a print up to 15 × 12. Acetic acid is employed to get rid of the iron, and is used both before and after fixing. The enlargements when fixed are taken out of the dark room to be washed, an operation carried on in a series of large tanks.

The washing of a silver print or bromide enlargement is an important matter, and is evidently so regarded by Messrs. Illingworth. No mechanical washers are employed, but the prints are transferred from tank to tank, and are laid down on an inclined slate slab between each such transfer, sprayed on with a hose and squeegeed. "This," says Mr. Illingworth, "is the old-fashioned way of thirty years ago, with silver prints, and, although more trouble and labour than any mechanical washing, is in my opinion more efficient." This would certainly seem to be the case, and there could have been very little trace of hypo in the prints which we saw undergoing this very thorough form of washing.

So far we have been in the new buildings specially erected for the work done in them, but we now leave these and pass into the house in which the works started. Here we find the offices, together with two rooms in which a number of artists are to be seen colouring and working up enlargements. At the back of these premises are the rooms in which platinotype and silver printing are carried on, and in which the various prints, &c., are mounted. Here also is a packing room. These operations call for little remark from us, no departure from recognised methods being noticed. Before leaving, Mr. Illingworth pointed out to us some vacant land beyond the works as giving him the opportunity to enlarge if necessary, a proceeding which, to judge from the busy condition of the firm, is far from being unlikely; and expressing our hope that this will soon be the case, and thanking him for the trouble taken to enable us to lay this article before our readers, we return to Willesden Junction, wondering whether photography as a business is in quite such a bad way as some of our pessimist friends appear to believe.

PHOTO-MECHANICAL NOTES.

The possibility of taking direct half-tones from nature, at which I hinted in my last notes, and referred to in a recent editorial in this Journal, has been long ago proved. The earliest attempt within my experience was made by the late Mr. R. L. Kidd, who, acting upon my suggestion, had a portrait of himself taken through a Levy screen. This was in the early part of 1894. It was on a dry plate, and was very successful, but I forget the exposure. One thing the negative was chiefly notable for, viz., the most subtle rendering of delicate tones in the high lights. For instance, a strong high light like a white collar was rendered with beautifully soft shade in the curves and folds, and the flesh tints were also modelled and rounded in such a way that the negative seemed to have had all inequalities smoothed down by a skilful retoucher. Whether Mr. Kidd followed up this experiment I don't know, probably the matter was put aside for further investigation in those spare moments which the busy man fondly anticipates but never attains; and his lamentably sudden death, which occurred not many months after, put an end to it for ever.

Another experiment of the kind which I well remember, and in fact I have the negatives somewhere, was an attempt of mine to take a landscape through the screen, whilst on a visit to my friend, Mr. W. A. Whiston, at Llandudno. This was in the summer of 1894. The view was from the window of that gentleman's house, and he will be able to corroborate me as to the circumstances. To the best of my recollection, the exposure was two minutes, with a square stop corresponding to *f*-16. The plate used was a now defunct Photo-mechanical, and the camera an ordinary half-plate, with Dallmeyer R.R. lens. The dark slide was, of course, made sufficiently large to take the screen—133 line Levy—with a separation of one-sixteenth of an inch from the plate. It required three shots to hit the exposure which would give dots in the shadows. The negative was printed and etched, and there was a quality of vigour and softness, quite absent from the usual reproduction from a silver print.

It may, no doubt, seem strange that I did not follow up these promising results, but the fact is I did not think more of them than that they were successful "flukes," and the half-tone process had

been so little investigated at that time that I could see no sure basis of working; and it was not to be expected that one could go into the field to take half-tone negatives by a process "of trial and error." To do that, one would have to take out a dark room on wheels like the old wet-plate perambulator, and that was impedimenta not to be lightly considered. Any way I have had no time to do anything more in direct half-tone since then.

No doubt, direct half-tones had been taken before my experiences, but I have not heard of any instances. However, our American friends have, I believe, been cultivating this branch of late, and it is a regular thing to send to the process man the actual objects for catalogue illustrations in half-tone. The firm of Blanchard & Watts, Boston, U.S.A., have been conspicuously successful in the direct reproduction of articles of jewellery, silver plate, &c., and a wonderful amount of detail is secured. There are no heavy shadows, the common drawback to direct photographs prepared for the wood-engraver, for the skilled half-tone worker knows how to break up the shadows with minute dots in the negative. Another notable direct half-tone was published not so long ago in the *Engraver and Printer*. It was a street view, the negative and block having been made by the Suffolk Engraving Company of Boston.

There is, in fact, no difficulty in making direct half-tones from still objects, and especially in a well-lighted studio, or out of doors in close proximity to the dark room. In such case, the exposure, which is the crucial part of the whole matter, can be tested. Whether the making of half-tone negatives from nature, anywhere and everywhere, can ever be done as readily as ordinary negatives are now made, is another question. So much, however, has been done of late to systematise the half-tone process, that I do not think it will be long before we hear of some one regularly taking direct half-tones.

Some difficulties of apparatus will have to be surmounted first, but no difficulty can long withstand the ingenuity of modern camera-builders. It will, for instance, be necessary to have a screen with much thinner cover glass than at present, so that as large an aperture as possible can be worked within the lens. The screen adjustment must be in the camera, not in the dark slide, so that several double backs can be used, as in ordinary landscape cameras. The diaphragm system must be so calculated as to work in geometrical proportion to the screen and focal extension without having to resort to guesswork. Further, it will be necessary to adopt some plan of apportioning the exposure of foreground and sky in landscape work. The lens will, of course, be fitted with a prism for securing reversed negatives. The exposure will have to be accurately timed by one of the numerous meters on the market, or in some definite manner, though it may be mentioned that the slow "process" plates which would be used give a great amount of latitude, and a little over-exposure can easily be corrected by means of a reducing solution. The dodge of flashing white cardboard in front of the lens may be resorted to in order to quicken the general exposure.

Now, if such a process as I have indicated comes within the range of practicability, what possibilities it opens up for illustrated journalism. The negative of some important scene could be printed on a copper or zinc plate, and etched out within one to one and a half hour from the time of its being dried off, and the reproduction would have lost none of the vigour of direct photographing. It may be urged that the use of slow plates and the retarding action of the screen would limit the class of subjects that may be taken in this way; but, as rapid plates are now made with wonderful freedom from fogging, it would be quite possible to select a suitable brand, and by careful adjustment of screen distance and diaphragm no serious loss of sharpness would result. The whole tendency of recent investigation and practice has been to show that the reason dry plates have not rendered such good results in the past has been that process operators did not work the optical conditions sufficiently exact for them, and a looseness of working, which was permissible with the wet-plate process by reason of the ease with which the result could be modified by intensification and reduction, was soon found to be impossible with dry plates.

I dare say it will be amateurs who will lead in any advance in this direction. Professional workers have no time for experimenting. But amateurs have not yet grasped the half-tone process, so it may be some years yet before direct half-tones are a regular thing. I hope, however, that those who have leisure, whether amateur or professional, will give some attention to this matter, which appears to me to open up a very profitable field. WILLIAM GAMBLE.

RENARD'S PROCESS AND APPARATUS FOR FLATTENING MOUNTED PHOTOGRAPHS.

M. E. RENARD, the patentee of this device, says in reference thereto:—

"When a photograph is mounted on card, its shrinkage causes the card to present a concave curvature on the face, sometimes in the length, sometimes in the breadth, sometimes in both.

"My invention relates to means of removing this curvature so as to render the face of the photograph flat.

"For this purpose I provide boards, convex, some longitudinally, some transversely, and some both ways; and on one of these, of suitable form, I place a mounted photograph, or a number of these, their convexity facing the convexity of the board. I clamp the whole within a rectangular frame, which is made of wood, with a metal rim fixed on its upper face, this rim projecting inwards all round.

"The mounted photographs, being thus clamped between the convex board under them and the flat rim above their margins, are flattened, and, while thus clamped, are kept a few minutes in a hot chamber, whereby the flattening is rendered permanent."

RECOMMENDING A HAND CAMERA.

I AM often asked to recommend a hand camera. "Tell me which of all the various hand cameras I see advertised should I buy," writes one seeker; and "How am I to select the best hand camera in the market?" plaintively asks another. To tell the truth, I would as soon recommend a saddle hack to a friend (says the Editor of the *Journal of the Photographic Society of India*). We all know that in the abstract the horse is an animal that can be ridden, just as we know that a hand camera is a piece of apparatus in which a photograph can be taken; but, whether the hack or camera I would recommend is the best for the purchaser's purpose depends on so many circumstances that I prefer to be excused. For instance, for the beginner in photography a hand camera is not to be recommended at all. His experience should be gained with a tripod camera, a rapid rectilinear lens, and a slow plate. When he has mastered the rudiments of exposure and development, spoilt a few dozen plates, and given vent to his feelings generally, he is in a more humble condition, and so better qualified to attempt work on a hand camera. Even at this stage of the photographer's progress, I doubt the advisability of trusting him with anything lighter or handier than a half-plate tripod camera. I doubt, indeed, whether one's progress is ever so rapid as to warrant the total abandonment of our old and trusty friend, the tripod.

In some of the recent home journals may be seen a portrait of the late Mr. J. Traill Taylor, the accomplished Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY. He is depicted with a half-plate camera fixed to its tripod, like a trusty rifle—"at the shoulder." Here was a man who knew more about photography than most people, and his attitude and his camera alike are silent witnesses of what he thought was a good photographic apparatus. Personally I have never found anything in the shape of a hand camera to beat this good old-fashioned instrument when serious work is in hand. But the average amateur is not a serious worker. On the contrary, his whole and sole aim is the acquisition of numberless little pictures of scenes he has visited, episodes he has passed through, and people whom he has met. He argues that he cannot pass through life with a tripod camera at the shoulder, and could never get the pictures he wants if he had to "ground arms" and pass through the elaborate drill involved in focussing, plate-loading, capping, presenting, and firing a tripod camera. And he is quite right. For such work nothing but an ever-ready hand camera, a snap-shotter, so to say, can yield him the "bits" he yearns after.

Now we are approaching our subject. Amongst the essentials of a serious half-plate tripod camera are a firm support, a good lens, a glass plate-holder, arrangements for focussing, and a cap. There may be added to these many elaborations, such as rising and falling fronts, swing backs, lens shutters, &c., but they all tend in one direction, namely, to the seriousness of the work. In the earlier days of the hand camera these essentials were all more or less kept in view, and to this day certain makers of them—themselves serious probably—insist on the necessity of double backs, focussing arrangements, rising and falling fronts, and swing backs. When very positive, as well as serious, they also provide a veritable tripod on which to fix their instrument, but the weaker makers compromise the situation by turning the tripod into a make-believe walking-stick. With such instruments as these the serious worker who "goes in" for a hand camera is more than content; but, between you and me and the tripod, dear reader, he was much better off with his honest tripod camera.

Other makers, again, crowd into their hand cameras all kinds of machinery, till they look as intricate, and bewildering, and dangerous as

the engine-room of a torpedo boat-destroyer. "Give us a long-focus hand camera," says one worker, "something with which I can take a distant view ten thousand miles away." And straightway he is supplied with an instrument as long and unwieldy as a coffin. "Oh, do away with these heavy double backs," says another; "I can only carry three of them, and that means limiting me to six pictures for an outing, whereas I want to take six hundred." And, presto! out comes some marvellous press-button roll-holder camera, warranted not to splutter. "But I must see the image full size, as I am taking it," says a third, "and I want to take only objects in motion on treble XXXXX rapid plates." So still more hand cameras are placed on the market, which depict a bird on the wing, a horse leaping a fence, or a man's leg in the air as he is walking along—anything and everything in the most awkward and ungainly of attitudes. I hope I have said enough to convince inquirers of the hopelessness of attempting to advise in the purchase of any particular hand camera. It depends entirely on the wishes and proclivities of the purchaser as to which he ought to buy, and there are designs now in the market to suit all tastes, from the most serious to the most frivolous, and all pockets, from those as shallow as mine, or, like those of my readers, deep, let us hope, as the Indian Ocean.

PHOTOGRAPHY OF COLOUR.

[Society of Amateur Photographers of New York.]

It would be presumptuous on my part to expect to present to you this evening much, if anything, entirely new pertaining to a subject to which so much careful study has been given for more than a quarter of a century, the fundamental principles of which, in fact, have been known ever since photography itself was discovered. It only remains for us to bring the many delicate and intricate details to a higher degree of perfection and to put them more completely under our control.

In order that we may proceed intelligently with the problems before us, I will briefly state the theory now held of the nature of light. The boldest assumption ever made by the scientist is that of the existence of an all-pervading ether, a nothingness, yet having such properties as perfect elasticity, no weight, continuity, filling all space not occupied by matter, &c. Time will not permit of the discussion of the nature of a scientific theory. Suffice it to say that no theory is of any value whatever which positively fails in a single test to which it may be put. In this, as in most cases, the proof is entirely negative—it cannot be demonstrated that such an ether does not exist, while, on the other hand, it enables us to account for a large number of phenomena, otherwise unexplained. So much, then, for the validity of the theory. The ether may be defined as that compilation of properties necessary for the explanation of the phenomena of light, electricity, and radiant heat.

The undulatory theory assumes that energy may be transformed into that state in which it may be propagated by the ether at the enormous velocity of, approximately, one hundred and eighty thousand miles per second, in the shape of waves, exceedingly small, but of definite dimensions. These waves are of the transverse kind, *i.e.*, similar to those on the surface of water, in which the vibratory, or up-and-down, motion is crosswise to the onward or propagatory motion. At present our knowledge of this wave motion is limited to a range of about eight and a half octaves, to use a musical term, an octave meaning the doubling of the number of vibrations. The eye is affected by less than one octave of these ether vibrations, the longest that can be perceived being about one-thirty-eight thousandth of an inch in length, and the shortest about one-fifty-nine thousandth of an inch. Light, then, is defined as that range of ether vibrations whose wave-lengths lie between these limits. I shall, presently, show, with the lantern, how the waves of different lengths affect the eye. For the present it will be sufficient, but important, to note the well-known fact, that the longest of these waves produce the sensation of red, the shortest, of violet, while those of medium length produce that of green. Now give your imagination full play for a few minutes, and picture every source of light, from this lamp to the blazing sun itself, as sending forth, along straight lines, in all directions, a subtle, palpitating set of waves, speeding on through space at a rate great enough to carry them more than seven times around the earth in a single second, and you have the theory in operation before you.

Perchance, a few of these rays enter the pupil of your eye and strike into that sensitive chemical of the retina, called purpurine, in which the optic nerve terminates. Is it any wonder that the delicate molecules of this substance are shattered, and its rich purple bleached and faded, and that the nerve terminals in the midst of this disturbance recognise that something has happened? The mind simply says: "I see." This is the theory of vision. We are interested still further with this purpurine. Every one knows that the pupil of the eye dilates or contracts accordingly as the intensity of the light is less or greater. But the pupil is not the only regulator in this matter, as was formerly supposed, nor could it be, for the eye accommodates itself to a change of intensity, amounting often to more than a hundredfold, while the contraction of the pupil to, say, one-third of its former diameter (and that amount would be phenomenal) would compensate for less than a tenfold increase in intensity. It is now known that the amount of purpurine infused into the retina is greater as the quantity of light is smaller; in other words, the sensitiveness of the eye is made by this means to vary inversely as the quantity of light admitted approximately.

Thus the eye is a perfect camera, not only in its mechanical construction, but in its chemical action also, and is far more convenient, in that the sensitive film is not mounted on a glass plate or on a roll of celluloid; but the new sensitive material is constantly supplied and the old withdrawn without interrupting the operation of sight.

The theory of the vision of colour, assumes that there are three kinds of purpurine. One is susceptible to the action of the long waves of light, and, consequently, gives the sensation of red; this may be called the red-perceiving variety of purpurine. Another kind is affected by the short waves and gives the sensation of violet, and the third by those of medium length and produces the sensation of green; and these may be called the violet-perceiving and the green-perceiving varieties, respectively. Other colour sensations are produced when two of these varieties are acted on simultaneously; for example, the perception of yellow results when both the red and the green varieties are affected, and, when all three are acted on in the proper relative degree, the sensation of white is produced. One of the strongest arguments in favour of this theory is found in cases of colour blindness, in nearly all of which the result is just what must happen if the red-perceiving purpurine is absent; in a few cases the green-perceiving variety is wanting, either alone or along with the red. This is, practically, Young's theory of colour vision, but with this modification, that instead of his triple nerve terminals of different lengths and their mode of operation, which was simply mechanical, we have a purely chemical process, which is so analogous to photographic action as to demand careful consideration. Instead of assuming the actual existence of different varieties of purpurine, it would probably be more correct to attribute the several colour sensations to different characteristic modes of chemical decomposition of the purpurine by the various rates of etheric vibration.

The question as to what the primary colours are suggests itself in this connexion. We will define them as that fewest number of colours with which all possible varieties of colour may be produced; and these are red, green, and violet, and not, as is usually stated, red, yellow, and blue, notwithstanding the necessity of using red, yellow, and blue pigments to produce the whole range of colour, in printing or painting. Red, yellow, and blue ought not, however, to be called the primary colours, for neither the yellow nor the blue colour of a pigment is a simple colour, but rather a combination of two colours, in consequence of which green results when yellow and blue pigments are mixed or superposed.

I would urge the adoption of such a definition of primary colours as will avoid the necessity, and exclude the possibility, of there being two sets of primary colours; one set for coloured light, as such, and another for light from coloured pigments, for that is both confusing and unscientific. Since the spectroscope shows the colours from yellow and blue pigments to be complex, they cannot be considered primaries. The definition, then, should read: The primary colours are that fewest number of pure spectral colours which, singly and in varying combination with each other (or by their total absence), will produce the entire range of colour vision. Spectral red, green, and violet are these colours, and there can be no other primaries. A pure spectral colour, physiologically considered, is the colour sensation produced by a single limited section of the natural spectrum; for example, roughly speaking, the section from D to E is spectral yellow. In a physical sense, a spectral colour is a particular continuous range of wave-lengths, whose limits are largely determined by its physiological effect. On the other hand, a complex colour, as, for example, complex yellow, results when spectral red and spectral green are combined, and this may be either with or without spectral yellow.

The eye cannot distinguish between spectral and complex colours, but the spectroscope at once reveals their true nature.

The explanation of the colour of an object, it will be remembered, is that, when white light falls upon a body, some of the waves, the longer, or shorter, or medium ones, singly or combined, are absorbed and cease to exist as light, while the rest are reflected, and, being of particular lengths, produce a corresponding colour sensation. The colour, then, is not possessed by the object itself, but results from its power to absorb a part, and reflect the remainder, of the white light which strikes it. If

all the waves are reflected, the object is said to be white, as a piece of white paper or cloth; if none are reflected, but all absorbed, the term "black" is used to designate the absence of reflected light. A perfectly black hat, hung against a perfectly black wall, would be no more visible in broad daylight than in blackest night; but, as it is not possible to find a material which will reflect absolutely no light, such a result can only be approximated in the experiment.

In the case of transparent coloured bodies, a little further explanation is necessary. A piece of clear glass transmits the waves of light practically undisturbed, so far as their length is concerned, while a piece of red glass permits only the long waves to pass through it, at the same time absorbing the others; a green glass transmits only those of medium length, while only the short waves get through a violet glass. Of course, it is understood, these colours must be pure and saturated, conditions that can only be approximated in practice. Often the waves that do not penetrate are reflected from the surface on which they fall instead of being absorbed, and thus a large part of the set of waves is separated into two divisions, and the colour effect produced by one division is said to be complementary to that produced by the other, that is, the resulting colours are complementary.

It is evident from this that two complementary colours combined will produce white light, since, together, they contain the whole range of visible waves. An illustration of this kind of separation of light is found in common red ink. If a few drops are poured on a black surface, the ink will appear green; or, if allowed to dry on a pen or on the stopper of the bottle, they are coloured green. The inks used in printing coloured pictures, and many of the pigments used by the artist, are transparent materials, that is, a high degree of transparency is one of their most essential qualities, and, when these are spread on a white surface, the result is practically the same as laying on the surface a very thin piece of glass having the same colour. In both cases a particular part of the light only is transmitted to the white surface beneath, which reflects it, to be retransmitted and carried to the eye, so that the surface appears to have the colour of the transmitted light.

Let us assume, for the present, what will be proven later, that blue glass or blue pigment is blue because it transmits green and violet light, either with or without spectral blue, and that yellow glass or yellow pigment is yellow because it transmits green and red light, either with or without spectral yellow. Now, if a layer of blue pigment be superposed on a layer of yellow, but one colour will be able to pass through both, and that will be the one transmitted by them in common, that is, the green. Consequently, the production of green by the combination of yellow and blue pigments is not caused by a chemical action, but is a purely physical result. Neither does it argue in the least that yellow and blue should be considered primary colours. In the same way orange is formed by the combination of yellow and red, and purple, from blue and red; and, furthermore, it is evident that, if red pigment is superposed with yellow and blue, all the light will be absorbed, and the surface becomes black.

We are now ready for the explanation of the method of making a coloured picture by, what has been termed, the tricolour process. Let it be understood that the problem of coloured photography cannot be admitted into our discussion this evening. It remains, up to the present, practically unsolved, and bids fair to baffle the scientist for some time to come, notwithstanding it has been the fondest dream of the photographer for more than half a century to reproduce Nature in all her varied hues. The photography of colour, however, is a very different thing, and is quite practical. It constitutes the first, and perhaps the most important, part of the tricolour process. I may assume that all who are associated with this Society are familiar with the operations of making an ordinary photograph, and have carefully studied that all-important thing, a negative, which is simply a film rendered opaque in some parts, quite transparent in others, and having all degrees of sub-transparency ranging between. This negative is a miniature reproduction, perfect in form, but without any of the colour of the original.

Now, for our present purpose, we will group all the colours in any subject we may wish to make a picture of into five classes, viz., the blacks, reds, yellows, blues, and whites. It is understood that each of these so-called classes is supposed to contain what would correspond to one of the effects of coloured pigment ingredients if the original had been produced by the use of red, yellow, and blue pigments, *i.e.*, each class contains a particular colour, not only when it is pure and uncombined (in which condition it might be absent altogether), but also when combined with one or both the others, in large or small quantity, and no matter how thoroughly disguised. A careful examination of a common negative shows that the transparent parts correspond to the blacks, reds, and yellows in the original, while the opaque parts correspond to the blues and whites; the whites because of the blue in them. This means, then, that only the blue, or, more properly, the blue-violet, light produces the opacity in a common negative. When a black-and-white monochrome or ordinary photograph is made, its light and dark regions are just the reverse of those in the negative, so that the light parts of the photograph represent the whites and blues in the original, while the dark parts represent the yellows, reds, and blacks. This monochromatic representation of colour is strongly objected to by the artist, and with good reason, as I will show a little later. Results very different from that obtained on an ordinary plate, with the usual methods of exposure and development, may, however, be had under special conditions. Most important among these are the so-called sensitisation of the plate and the filtration of the light. Notwithstanding the interesting results of Mr. Ives's experiments on the sensitisation of the ordinary plate, published some time since, which seem to show that, with proper filtration of light, photographic action may be obtained from any part of the spectrum, yet, in practice, it is necessary to make use of sensitisation. The methods of sensitisation and the results it produces may be clearly stated, but not so when it comes to explaining what the nature of the effect produced on the plate really is.

The violet end of the spectrum acts generally as a reducing agent, while, on the other hand, the red end often shows a tendency to act as an oxidising agent, under ordinary conditions. However this may be, one of the essential properties of a sensitiser is chemical in its nature, and such as to enable it to appropriate to itself, and dispose of, the oxidising tendency of the red end of the spectrum. Another very important, if not indispensable, property is physical in its nature, the so-called optical property, *i.e.*, to be most effectual, the sensitiser should absorb only that colour the photographic effect of which is desired, the remainder being reflected, which means that the colour of the sensitiser is complementary to the colour to which the plate is to be rendered sensitive; thus, cyanine and malachite green sensitise to red, and erythrosine and methyl violet sensitise to yellow, &c. When the kind, extent, and degree of sensitisation are determined, the problem of filtration is quite simple.

The filter must be chosen with reference to the condition of sensitiveness. Many experimenters make a serious mistake at this point by assuming that, because the end in view is to obtain three photographs, one of the red, another of the green, and another of the violet colour ingredient (in the case of a lantern picture), they must needs use ray filters of corresponding colours. Such filters would perhaps be the correct ones to use if there could be produced in the plate a perfectly uniform and continuous sensitiveness throughout the entire visible spectrum. It is doubtful, however, if such a condition is at all desirable. Various sensitisers may be made to produce maximum sensitiveness in one or more particular regions of the spectrum without, as a rule, appreciably diminishing any sensitiveness previously possessed by the plate. If, then, sensitiveness is produced in regions where it is desired to have it, there will generally be one or more other regions also sensitive, and it is the function of the filter to cut out the one or more other colours to which the plate is sensitive, but which it is desired should not produce an effect. For example, if a plate is rendered sensitive to green, it will still be sensitive to blue and violet, and, in order that it may photograph green only, the other two colours must be cut off; consequently, any filter which will transmit green but not blue and violet will do equally well, *i.e.*, it may be a yellowish green, or a yellow, or even an orange, and the result will be the same. Or, again, if a plate is rendered sensitive to yellow, it will retain its blue-violet sensitiveness, which makes it necessary to cut off the blue and violet, if the yellow is to be retained alone, and, as before, a yellow, or orange, or orange-red filter will give, approximately, the same results. Cyanine produces sensitiveness in regions of the yellow and orange, and well into the red, so that, with the natural blue-violet sensitiveness, all the spectrum, except the green, region, is sensitive; consequently, it is not strange that almost any red filter, which does not transmit blue and violet, will give about the same result. This red filter may transmit much, or little, or no green, without modifying the result in the least, and yet the difference in appearance to the eye, resulting from the transmission of more, or less, or no green, is exceedingly great. No other explanation than this is necessary; nevertheless, some of the best-known experimenters pronounce it paradoxical that red filters, of different quality, give practically the same results. The question is not so much, What shall the ray-filter admit? as, What shall the ray-filter exclude? Of course, it must admit the particular colour whose effect it is desired to obtain. It follows from this that with the usual methods of sensitisation, no matter what the result desired, there is positively no need whatever of a green filter.

PROFESSOR J. STEWART GIBSON.

(To be continued.)

PHOTOGRAPHING ANIMALS TO SCALE.

Mr. W. I. Chadwick's plan of utilising photography for the purpose of obtaining photographs of animals taken to scale is described by himself as follows:—

As is well known, photographs of animals are practically useless for purposes of measurement, owing to the effects of perspective, ignorance of the distance of the point of sight, and the general absence of comparison with objects of known dimensions. The object of my said invention is a definite process or procedure having known conventional constants, and the introduction of a comparison scale into the photographs for purposes of measurement or estimation of the dimensions of the animal.

For example, in making photographs of horses according to my said invention, I use a lens of known focus, fixed at a known height above the ground and at equal or proportionate distances from certain fixed marks in the ground. The horse is brought in front of the lens and over the indicating marks on or in the ground. The position of the horse's feet with respect to such marks is noted either by eye observation or by examination of the photograph.

Subsequently, with the lens still in the same position with regard to the indicating marks, a screen, having horizontal and vertical bars, subdivisions, or graduations, is placed on the line running between positions previously occupied by the fore and hind feet of the horse. A photograph of this screen is taken, and by double printing, superposition, or combination, the two photographs of the screen and the animal are combined into a single photograph. Owing to the procedure adopted, the vertical plane of the screen will coincide with a vertical plane through the spine of the animal, and, partaking of the same effects of perspective projection, the contour of the animal may be quantitatively noted, and reliable comparison of what are known to breeders as "points" may be made between photographs of animals taken at different times and places. According to a modification of my said invention, a screen, or graduated framework is placed about the animal in a plane passing through its spine, and is photographed simultaneously with the animal.

SEAMAN'S PRINTING FRAME FOR STAMP PHOTOGRAPHS.

Mr. Edward Seaman has patented a printing frame to print twelve photographs, each one inch by three-quarters of an inch, on one piece of prepared photographic paper three inches square. The frame consists of two slides. One contains a hole, one inch by three-quarters of an inch in size, which is the size of the photographs, made in such a manner that a negative may be fixed behind it; the other slide contains a hole three and a quarter inches square. The paper is laid on a ledge, which goes round the hole, and fixed by means of the back. The slides are grooved, so that when fitted together each one may be moved to and fro. By this movement the paper is brought into position behind the negative, and is exposed by the frame being held up to a light. The slide is moved again to change the position of the paper, and then it is again exposed. This is repeated until twelve exposures have been completed, thus producing twelve separate photographs on one piece of paper.

HODDLE'S APPARATUS FOR MOUNTING PHOTOGRAPHS.

Mr. Charles Hoddle's description of his invention for mechanically mounting photographs is as follows:—

I provide a drum or cylinder, mounted in any suitable manner, and adapted to be rotated either continuously or intermittently, and to receive the wet photographic or other prints, which are placed face downwards thereon, preferably by hand, a roller being provided for partially drying the prints and pressing them on the drum or cylinder.

In any suitable position in the path of the drum or cylinder I provide a receptacle to contain paste or other adhesive material, the said receptacle having an opening through which the paste escapes on to the back of the photographic or other print as the latter passes under the opening. The opening of the receptacle is provided with an indiarubber or other suitable squeegee or scraper for spreading the paste evenly over the back of the print. I further provide a case or receptacle for the mounts, and means for feeding the same one at a time down through an opening or slit in the bottom of the receptacle on to the periphery of the drum. An indiarubber or other roller is placed underneath the said slit or opening, so that the mount is held firmly against the periphery of the drum, and the movement of the mount is so regulated that it arrives opposite the said roller at the same time as the corresponding print, whereby the latter is firmly pressed on to the mount, and is caused by the paste to adhere thereto. A second pair of rollers is preferably provided, through which the mounted photographic or other print passes.

For feeding the mounts through the opening in the box or case containing the same I advantageously mount a face cam on the drum or cylinder spindle, or I form the same on the end of the drum, the said cam actuating a lever which reciprocates a slide, the said slide forcing the mounts one at a time through the slit or opening in the box containing the same.

Our Editorial Table.

The "Sweetheart" Adhesive Cloth.

Marion & Co., Soho-square.

This is a thin cloth, one side of which is coated with an adhesive substance, thus admitting of the rapid mounting of photographs. It is pointed out that, among others, reduction in weight and bulk, perfect protection against tearing or cracking, without the necessity of using a rolling press in mounting, are some of the advantages which may lead to its general adoption. The following are the directions for use:—"Place the photograph, face downward, upon a sheet of paper larger than the cloth, place the brown (coated) side of the adhesive cloth upon the back of the print, apply an ordinary flat iron, moderately hot, to the back of the cloth, and press well in contact with the print. If preferred, a hot roller press can be used for this operation, in which case it is only necessary to pass the print with the cloth once through the rollers." Many opportunities, doubtless, arise in both professional and amateur practice when it is advantageous to mount prints on cloth supports, and the "Sweetheart" cloth supplies quite the thing for the purpose.

The Perfectus Sensitised Albumen Paper.

The Perfectus Sensitised Paper Co., 33, St. John's-park, Blackheath, S.E.

We remarked, last week, of celluloid films, that a determined effort was being made to popularise them among photographers, and the same observation holds good with regard to sensitised albumenised paper, in which many photographers and some manufacturers appear still to retain great faith. The above-named Company sent us, the other day, some pieces of the "Perfectus" paper to try, which yielded us prints of great richness and evenness. The "Perfectus" paper appears to have been well made and liberally sensitised, and is as good a paper of its kind as we have tried.

The Parastudio.

W. Watson, 130, West Graham-street, Glasgow.

A rough model of the Parastudio has been submitted to us for inspection by its inventor, Mr. W. Watson. It is intended for controlling the light in outdoor portraiture. It may briefly be described as consisting of a light metal tripod stand with a species of umbrella attached, which is adjustable at various angles. The whole thing by the aid of a fabric adapter can be converted into a tent. The Parastudio embodies a good idea, and for garden portraiture should be found useful in controlling the light as circumstances dictate.

The Austin-Edwards Films.

Austin Edwards, Willoughby-lane, Park, Tottenham.

Mr. Austin Edwards has lately asked us to subject some of his Double Instantaneous films to trial, and the result of having exposed and developed them is to confirm us in the opinion we expressed of them when they were first introduced, nearly two years ago, namely, that they possess great speed, combined with the power of resisting fog, even under strong or forced development. The emulsion is fine in the grain, and the preparation of the films throughout is evidently accomplished with great care. Among those who cater for the supply of cut films, Mr. Austin Edwards deserves to take a prominent place, and it will not be the fault of his films if he does not retain it.

Catalogues Received.

Joseph Levi & Co., 97, Hatton-garden, E.C.

Messrs. Levi's catalogue is an elegant production of over 130 pages, and, between its covers, it is difficult to discover that any modern requirement in the way of photographic apparatus has been denied mention. The catalogue, in addition to its completeness, has the further merit of being well illustrated.

W. Butcher & Son, Blackheath, S.E.

Messrs. Butcher's catalogue is largely a *résumé* of the firm's own specialities, of which, as our readers are aware, they have many. For the rest, a large selection of apparatus and sundries is recapitulated and illustrated.

Reduco.

Arthur Harrison, 221, Cowbridge-road, Cardiff.

This is a pink-coloured, ointment-like mixture, which, upon being applied gently with a leather stump or a soft cotton rag on the ball of the finger to the too dense or halated parts of a negative, will effect the desired degree of reduction. We have tried Reduco, and found it answer its purpose.

News and Notes.

We are informed that the Oxygen Compression Works of Messrs. Leonard Chapman & Co., Sheffield-street, Lincoln's Inn-fields, W.C., have been acquired by Mr. Walter Tyler, of Waterloo-road, S.E.

It will be seen, from an announcement made in our outer columns, that, in future, packages of dry plates will be obtainable at the railway bookstalls of Messrs. W. H. Smith & Sons. Doubtless, many amateur photographers and others will much appreciate this convenience.

Paisley Photographic Society.—The following are the office-bearers for 1896-97:—*Hon. Presidents:* Messrs. H. H. Smiley and Stewart Clark.—*Hon. Vice-Presidents:* Messrs. Robert Harris, James Donald, jun., James Barr, and A. F. M'Callum.—*President:* Mr. Edward Cook.—*Vice-President:* Mr. Thomas Rastall.—*Council:* Messrs. D. B. Jack, F. Matheson, J. Gibson, J. Munre, C. Glassford, M. M. Wright, and J. M'Kinlay.—*Treasurer:* Mr. Robert Pitblado.—*Secretaries:* Messrs. Robert M'Kinlay, Wallace Lea, Glasgow-road; and Robert Alexander, 2, Gordon-place.

Enlarging on Canvas.—In the *St. Louis and Canadian Photographer* the following method of enlarging upon canvas is given:—Wash canvas in hot water, rinse with cold, after which stretch to remove all folds. Salting solution: Potassium bromide, 3 parts; potassium iodide, 1 part; cadmium bromide, 1 part; water, 240 parts. Thoroughly saturate the canvas with this, and hang in a warm room to dry. Then sensitise with nitrate of silver, 4 parts; citric acid, 1 part; water, 140 parts. Sensitising is done same way as salting. Expose in solar camera, or in a similar camera illuminated by electric light. Develop the exposed canvas in pyrogallic acid, 10 parts; citric acid, 4 parts; water, 410 parts. Use slightly warm, and about 10 minutes are necessary to bring out the picture, thoroughly washing after development. Tone same way as silver prints, with acetate of soda and gold. Fix in hypo-sulphite of soda.

The law of copyright in this country has occasionally been strained unjustly in cases which it was hardly intended to cover, but in America it is apparently a power which can be used almost to the extent of persecution. Messrs. Harper Bros., the publishers, of New York, have recently entered an action against Messrs. Riley Bros., of Bradford and New York, the well-known optical lantern outfitters, which certainly puts the American copyright law in a very unfavourable light. When the popular story *Ben Hur* was printed by Harpers, they reserved all rights to the publication and dramatisation of the novel, and afterwards sold the dramatisation rights to Messrs. Clarke & Coxe, a Western firm. Messrs. Riley, at considerable expense, have prepared an illustrated lantern lecture on the story, and Messrs. Clarke & Coxe now object to this as an infringement of their rights of dramatisation, and claim damages to the tune of 10,000 dollars. The case had not come to a hearing when the latest advices were received.—*Bradford Observer.*

The statement is interesting, as coming from Professor William Huggins, foremost in such researches, that beyond the violet end of the spectrum there is a whole gamut of invisible rays, which only reveal themselves by their effect in promoting chemical action, and similarly, beyond the other end of the visible scale, the deep red, there is a gamut of invisible, or dark, rays, which are only perceived by their heating effects. Some idea, he says, of the importance of the "ultra red" may be gathered from the fact that it has been traced to a distance nearly ten times as long as the whole range of the visible, or light-giving, region of the spectrum. To learn, then, the character of these mysterious dark rays, it has been clearly necessary for science to fit itself with some new sort of eyes for seeing what ordinary eyes cannot, namely, heat rays and chemical rays; and, in respect of the latter, the photographic plate has brought out some wonderful facts, while the bolometer has been used in feeling for absorption lines in the great invisible spectrum which lies beyond the red.

The Glasgow "Evening Times" Annual Photographic Exhibition.—This Exhibition will have classes for amateurs and professionals. Thirteen silver medals, thirteen bronze medals, and certificates will be awarded. The Exhibition opens August 3, and closes August 29. Pictures are to be sent in on July 15, 16, or 17. Classes for amateurs only: I., II., III. Landscape or Seascape. IV. Portraiture or *Genre* Study. V. Hand-camera Work. VI. Architecture. VII. Novices' Work. VIII. Lantern Slides. IX. Stereoscopic. X. Enlargements. XI. Champion Class. Classes for professionals only: XII. Portraiture or Figure Studies. XIII. Landscape or Seascape. All pictures must be sent in to the Rooms of the *Evening Times* Camera Club, 46, Gordon-street, Glasgow, on one or other of the following dates: July 15, 16, or 17. On each of those days the Rooms will be open from twelve o'clock noon to nine p.m. for the reception of pictures. Correspondence relative to the Exhibition should be addressed to Mr. H. C. Shelley, *Evening Times* Office, Buchanan-street, Glasgow.

Röntgen Ray Phenomena.—Mr. J. William Gifford writes to *Nature*: "At one of my demonstrations last week two tubes failed to act. They were both of the kind which depend for their action on a piece of platinum placed within, and from which after bombardment by cathode ray the Röntgen rays take origin. A glance at the tubes showed that, owing to the unusual strength of spark, the platinums within them were red-hot at the point of impact. Before the demonstration the tubes had been in good working order. I considered they had broken down, but, on returning home, tried them with the spark from my own apparatus, with which they had before answered well. I was somewhat astonished to find them giving off Röntgen rays rather more freely than when first tried. This tends to show that Röntgen rays are not given off by platinum heated above a certain temperature. I think this has already been suggested, but I have not seen it corroborated. Following up the idea of reinforcing the effect of the Röntgen rays by placing a fluorescent screen under a sensitive film on celluloid, the celluloid side being next the screen to prevent "grain," and having tried screens of barium platino-cyanide, potassium platino-cyanide, calcium tungstate, natural scheelite, artificial scheelite (Edison's), fluoro spar and calcium fluoride, I find that potassium platino-cyanide and artificial scheelite alone produce any effect through celluloid. Barium platino-cyanide, placed underneath, gave no effect either in contact with the sensitive film itself or through celluloid, but the films were not sensitive to yellow, and this salt gives yellow fluorescence. The effect with potassium platino-cyanide was decidedly the best."

A New Type of Telescope.—A very important discovery has been made by Professor C. S. Hastings, of the Yale Scientific School, the result of which is a new type of telescope, in which the defect known as the secondary colour aberration is removed without the use of other than the ordinary silicate glasses, says the *Evening Post* (New York). In developing last summer the optical equations involving the thickness and separation of lenses to the second order of magnitudes, Professor Hastings found a term which might be of the opposite sign to that involved in the equations of colour correction. Although it seemed improbable that this would afford a means of correcting the old error, it demanded, in the Professor's opinion, further investigation. After much labour he demonstrated theoretically a new method by which the secondary chromatic aberration, which had resisted solution for almost a century and a half, might be remedied. He next constructed a telescope with a ratio of focal length to diameter of only eight and a half, for use with the spectroscope. This has fulfilled in every way the hopes founded upon the theoretical investigation. It shows the solar spectrum with absolutely unvarying focus from extreme red to extreme violet, eliminating all secondary colour aberration. While the experiment has not gone beyond this, there is no reason to doubt that the method is applicable to telescopes of all sizes. Several years ago Professor Hastings published a construction involving a lens of but two kinds of glass, which very nearly met the desired end; but it has proved impossible to obtain large pieces of glass of the required kinds, and thus the method has been confined to small telescopes. It is an interesting historical fact that Fraunhofer, while endeavouring to solve this same problem, discovered the lines of the solar spectrum which bear his name. The discovery of Professor Hastings will add at least ten per cent. to the power of the telescope, so that an instrument with a ten-inch object-glass will be about equal to an eleven-inch telescope of the existing type.

A Great German Telescope.—The Berlin Industrial Exhibition opened May 1, and, in connexion with it, the Astronomical Observatory of Grunewald will be transferred to Treptow, near Berlin. One of the features of the Exhibition is that of photographs of old instruments, models of telescopes, reproductions of astronomical drawings and kindred subjects. As the largest refractor hitherto erected in Germany has only been one of eighteen inches' aperture, it is gratifying to note that one is now being constructed having an aperture of twenty-eight inches. The mounting is so arranged as to receive two objectives, of which one is designed for direct visual, the other for spectroscopic and photographic observations. For this reason the latter will be a double objective of short focal length, twenty to twenty-three feet, and large aperture, forty-three and one-third inches, which, for the present, will be exhibited in an unfinished condition, as the means for the purchase and polishing of the enormous lenses, which have been very successfully cast by Dr. Schott, can only be raised during the Exhibition. The rough discs of glass for the lenses of the telescope have been furnished by Dr. Schott and Gruesser, of Jena, while the polishing has been executed by Messrs. C. A. Steinheil, of Munich. The mounting of the instrument was intrusted to the Berlin Maschinenbeau Anstalt C. Hoppe, "who were assisted" by the firm of G. Meissner, Berlin, in the execution of the minute mechanical portions. The other objective, on the contrary, is completed, and has an aperture of twenty-seven and a half inches, and a focal length of sixty-eight feet. Instead of the usual dome, the telescope is provided with a cylindrical protective envelope, which, together with the tube, is mounted on a rigid box, which can be rotated round the declination axis. The polar axis is placed in the interior of the pier. Attached thereto, and therefore revolving round it, is a kind of bell, which encloses the observer's seat. The above-mentioned box revolves with the bell round the polar axis. The observer sits in the prolongation of the polar axis, in such a manner that his head is in the turning point of the whole telescope, so that he can easily follow its movements by slightly turning his head. The counterpoises for the tube extend at either end of the box, besides which there is attached a second bell, which serves to relieve the polar axis, and for this purpose runs on two anti-friction rollers fixed to the pier.

Affiliation of Photographic Societies.—Twenty-fourth Meeting of Delegates, held at 12, Hanover-square, on Thursday, May 21, 1896, Mr. W. Thomas (Chairman) presiding.—The Secretary gave the approximate figures of expenditure and receipts for the series of lectures just completed, which showed that, as far as could be seen at present, the lectures would have cost between 11*l.* and 12*l.* (after deducting sums received for tickets). After some remarks by the Chairman, a vote of thanks to M. Demachy was proposed by Mr. Oakden (South London), seconded by Mr. Huddy (Richmond), and carried. On the proposal of Mr. Panting (Woolwich), seconded by Mr. Beckett (Hackney), a vote of thanks was carried to Royal Photographic Society for the use of their rooms for the lectures. It was proposed by the Chairman, seconded by Mr. Oakden, and carried: "That the thanks of the Affiliation be given to Captain Abney, and Messrs. J. A. Sinclair, W. E. Debenham, J. D. Geddes, and W. T. Wilkinson for their lectures." The

Chairman suggested that a series of illustrated lectures should be prepared for circulation, and it was proposed by Mr. Oakden, seconded by Mr. Hertslet (North Surrey), and carried, "That the Affiliation Committee provide a certain number of special papers, illustrated by slides or otherwise, on various photographic subjects." After some discussion it was agreed that Messrs. Beckett, Hertslet, Mackie (Royal Photographic Society), Oakden, and Panting be appointed a Sub-committee to make the necessary arrangements for carrying this resolution into effect, the following subjects being suggested: Elementary papers upon lantern-slide making, pictorial photography, enlarging, architectural photography, photographic optics, printing methods, hand-camera work, and negative making. Mr. Oakden said that a desire had been expressed that the Committee should help the country societies, when desired, to arrange for lecturers. The following resolution, which was passed on February 24, 1894, was read: "That an offer should be made to assist local societies in the way of lectures if two or more of them could temporarily amalgamate for the purpose." It was agreed that the Committee already appointed should be instructed to take the necessary steps for carrying out that resolution, which, it was agreed, should apply to individual societies as well as to more than one society. The resolution of May 9, 1894, with reference to the circulation of a set of slides of Rejlander's work, was rescinded on the proposition of Mr. Bridge (Photographic Club), seconded by Mr. Marchant (North Middlesex). A desire was expressed that there should be another conference of Secretaries, and it was pointed out that the Secretaries of metropolitan societies had arranged with the Secretary that they were to be called together upon the application of any three Secretaries. It was agreed that the Chairman should make the best arrangements he could for the publication in pamphlet form of the series of lectures on the bichromate salts, with the stipulation that 200 copies should be supplied to the Affiliation for the Societies.

THE BUSINESS END OF THE QUESTION.—In the discussion of the question of emulsion *versus* albumen paper for printing photographs, the business view of the question, to those who aspire to raise our profession as much as possible out of the mire, financially and otherwise, has, so far, been ignored. Even granting that the question of relative permanence of results has not been determined, I would like to ask the better class of photographers on which side their bread is buttered? Is it on the side that puts the product in its qualities, after the negative gets to the printer, on a dead level with every tinkerer and cheap John who buys the same paper, or in adopting one where each photographer puts his own individuality in that, as he does in his negative? I have already proved, by our own experience, that the old method saves labour, both in the toning and washing operations, and in the finishing, and is therefore, in that sense, cheaper. But it is also true that in emulsion papers there is no latitude of treatment. Each paper must be treated by the method recommended by the makers; and those who would avoid trouble must see their prints exactly like those of every one who uses that paper. Whatever is made easy and mechanical is one more nail in the coffin of fair prices for superior skill and taste. On the contrary, the results on albumen paper, though always good in first-class hands, can be varied to suit each individual taste. One may like very warm tones; the other very cold tones, black and gray; another the medium between the two; yet all be equally good, according to the taste and skill employed. One may like strong negatives and a weak silver bath; another more delicate negatives and a strong bath. Both may yield excellent results, and yet differ entirely in character. One may like the purplish tones of the acetate bath; another the neutral warm black of the lime bath (in my opinion the most artistic of all); another prefers the brown and blue-black of the simple bicarbonate of soda bath. In none of these cases can exact imitation be followed by the cheaper class of men, but only by those with equal skill. In all the emulsion papers, the hard steely whites produced by the enamelled paper forming the support are in evidence where the negative is much stronger than a mud wash, and, wherever the toning is pushed in the least beyond a certain limit, we have the horrid effect of cold tones in the half-shades, with warmer colour in the deep blacks, while every artistic instinct points the other way; and no matter how strong may be the negative, unless it represents nothing but black and white, the albumen print always has a softer and more fleshy effect in the whites, an effect distinctly different from most emulsion prints, and by which the high-priced man can show his patrons that his work is not like his dollar or two dollar a dozen neighbour, who buys ready-made and ready-cut print-out papers. It is much more easy to convince people when the tones and surfaces of your prints are not like those of the host of photographers who put themselves, so to say, in the hands of the manufacturers. In other words, what is for the benefit of the unskilful and ignorant in our business is to the detriment of those who are of the better class. The dry plate was already a step in the levelling direction, yet its advantages compensated for it; but these papers, while incalculably more levelling, certainly show no compensating advantages so far, and, if we can save ourselves from the inevitable result, an intelligent self-interest justifies our doing so.—D. BACHRACH in *Wilson's Magazine*.

Patent News.

THE following applications for Patents were made between May 13 and 20, 1896:—

PHOTOGRAPHIC APPARATUS.—No. 9935. "Improvements in Apparatus for Developing, Toning, and Fixing Photographic Plates, Prints, and Films." J. G. WILLIAMS.

AUTOMATIC INDICATOR FOR SLIDES.—No. 10,030. "An Automatic Indicator for Photographic Dark Slides." J. B. SINCOCK.

KINETOSCOPE.—No. 10,033. "Improvements in the Photographic Reproduction of Moving Objects." S. D. WILLIAMS.

URANIUM INTENSIFIERS AND REDUCERS.—No. 10,072. "Improved Uranium Intensifiers and Reducers as applied to Photographic Negatives and Positives." A. HILL and THE CRESCO FYLMA COMPANY, LIMITED.

PHOTOGRAPHIC MAPS.—No. 10,118. "An Improved Mode of obtaining Photographic Maps and Earth or Ground Measurements." Communicated by A. Nobel. A. V. NEWTON.

DEVELOPING SOLUTION.—No. 10,157. "An Improved Apparatus for the Distribution of Solutions in the Development of Photographs and for other like purposes." F. C. BRIGGS and L. M. ISAACS.

LANTERNS.—No. 10,194. "Improvements in Optical Lanterns." J. RILEY, W. RILEY, and H. DALBY.

FILM-HOLDERS.—No. 10,217. "Improvements in Frames or Holders for Photographic Films." F. ANDREAE.

PLATES.—No. 10,242. "Improvements in the Production of Photo-chromatic Plates for General Printing Purposes." W. HAYWARD.

APPARATUS.—No. 10,495. "Improvements in or Relating to Lenses, Sensitive Films, and Cameras for Photographic Purposes." W. FRIESE GREEN.

LENSES.—No. 10,518. "Improvements in Lenses for Photographic Purposes." R. KRÜGENER.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
1.....	North Middlesex	Informal Meeting.
1.....	South London	*The Improvement of Negatives.* H. J. Dalby.
2.....	Brixton and Clapham	Ordinary Meeting.
2.....	Gospel Oak	Judging of the Competition Pictures taken on May 9.
2.....	Hackney	*Lighting.* W. E. Debenham.
3.....	Borough Polytechnic	*Lantern Slides, their Production and Use.* W. Wade.
3.....	Edinburgh Photo. Society	Election of Office-bearers and Council for Session 1896-7.
4.....	Leeds Photo. Society	*Some Notes on the Use of Orthochromatic Plates, with and without Screens.* S. A. Warburton.
4.....	London and Provincial	*Stops. f*-2. P. Everitt.
5.....	Aintree and District	Stereoscopic Photography.
6.....	Borough Polytechnic	Excursion: High Barnet.
6.....	Hackney	Excursion: Leigh. Leader, C. A. Russell.
6.....	Liverpool Amateur	Excursion: Ingleton. Leader, J. T. Norman-Thomas.
6.....	Oldham	Exc.: Alderley. Leader, J. Fullalove.
6.....	South London	Excursion: Edgware and Whitchurch. Leader, W. C. Boyce.
6.....	West Surrey	Excursion: Kew Gardens.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 21,—Mr. W. D. Welford in the chair.

A letter was read from Mr. E. J. Wall, who was to have read a paper before the Association, saying he was prevented from fulfilling his promise on account of the death of his mother.

It was proposed by Mr. FRESHWATER that the condolence of the members be conveyed to Mr. Wall in his bereavement, seconded by Mr. BEDDING, and carried unanimously.

Mr. A. L. HENDERSON brought up a quantity of developer, the constituents of which were not mentioned, and asked some of those present to try it against any other developer and report the result.

THE NEW PHOTOGRAPHY.

Mr. T. BEDDING had had a communication with reference to fluorescence of plates, which stated that, instead of using a screen of platino-cyanide of potassium for visual use with the X rays, one might substitute a gelatine dry plate, which answered in the same way. He inquired if anybody could confirm this, and said, if it could be done, it would probably account in some measure for the action of the X rays on gelatine dry plates.

Mr. T. E. FRESHWATER did not think in the ordinary way any fluorescence could be got from a plate. He had been going into the subject, but had failed to notice any trace of such an occurrence. It was said that the action of the rays was due to the fluorescence from the glass, but this he doubted. He would also like to see proved the assertion that a plate exposed to these rays developed from the back instead of the front surface. His experience pointed to the contrary, the image coming up in the usual manner. He did not think it was anything to do with the glass, as one got the same result with films, whether they were thick or thin.

Mr. HENDERSON inquired how the screens were produced. Those he had seen were very rough.

Mr. FRESHWATER said the paper was coated with the crystals with the aid of some tacky substance, but the process was kept somewhat secret. There was a screen which was quite smooth; but, whatever it consisted of, it did not give the amount of fluorescence obtainable with potassium platino-cyanide.

SCUM ON NEGATIVES.

Mr. BEDDING asked Mr. Henderson what was the cause of the scum on negatives in the form of irregular serpentine markings, which were often to be seen many years ago on gelatine plates. He had recently heard it put down to hand coating.

Mr. HENDERSON replied that the probable cause was simply the superheating of the emulsion, and suggested a remedy in allowing the temperatur

to go down and filtering through washleather. He said it could all be got off the negative with a little friction, but, as the exposure was made through the scum, there would remain transparent marks.

Mr. BEDDING pointed out, however, that the marks he referred to were not visible until the negative was dry. He had not encountered them at all until lately.

Mr. J. E. HODD inquired how long a piece of bromide paper should remain good if properly kept, and whether a manufacturer was justified in declaiming responsibility because the paper had been made five months ago.

The opinion was that it should last indefinitely.

The CHAIRMAN mentioned a new reducing medium which would soon appear. It resembled cold cream, and was used upon the negative in a dry condition by means of a wad or stump, the density being reduced by gentle rubbing. He did not know its composition.

Mr. BEDDING suggested that it probably consisted of fine pulverised pumice in some greasy vehicle.

Mr. HENDERSON thought this likely, but asked, Why play about with such things when you have ferricyanide and hypo—a perfect reducer?

A discussion occurred as to why a plate appeared denser when wet than dry; why drying by heat gave a denser negative than when done naturally; and as to the reason for a black developed negative drying green.

Mr. HENDERSON made a statement, as delegate of the Association to the Convention, with reference to his alleged grievances against the Council of the Convention, and his future attitude towards that body, giving details of the reasons for the breach between himself and the Convention.

On the proposition of Mr. BEDDING, seconded by Mr. FRESHWATER, it was resolved, "That this meeting expresses its confidence in Mr. A. L. Henderson, as delegate of the London and Provincial Photographic Association to the Photographic Convention of the United Kingdom," for which Mr. Henderson expressed his thanks.

PHOTOGRAPHIC CLUB.

MAY 20.—Mr. Naegali in the chair.

Mr. Welford passed round a series of photographs made with a hand camera similar to that shown by Mr. Hodd at a previous meeting. The results were good.

Mr. BEDDING drew attention to some negatives which he passed round. He asked for some explanation of the scum marks which showed upon the surface of the film. Various points were raised, and the general conclusion was that the peculiarity was probably inherent in the method of manufacture of the emulsion.

Mr. Tottem showed some pieces of gelatine printing-out paper which had a curious white mark in the centre of each sheet. This had the appearance of an oval patch, which was whiter than the rest of the paper, and which could be more clearly seen on the back than on the coated side. No probable explanation of the phenomenon was forthcoming.

Mr. WELFORD asked if any member had tried the new reducer, which was in the form of a "pink grease," and which could be locally applied. He had found it to reduce the yellow negative deposit caused by pyro soda, a feat which was difficult of accomplishment at any time.

Mr. CHILD BAYLEY then read his paper upon

PHOTOGRAPHIC SOCIETIES AND PHOTOGRAPHIC ART.

Mr. Bayley, in opening his subject, said that one of the first papers read before the now Royal Photographic Society, about the year 1853, was upon the subject of art in photography, and that many persons had been writing upon the same subject ever since. He had read much that had been published on this subject, and he ventured to say that he believed he was right in asserting that everything which was worth writing could be found in either Burnett's *Essays* or Robinson's *Pictorial Photography*. In most cases these authors had expressed their ideas more happily than their imitators and extractors. Dealing briefly with present-day writers upon photographic art matters, the author of the paper, without descending to personalities or mentioning names, applied a good deal of humorous, if sarcastic, comment, and closed an interesting paper with the statement that the best way to further photographic art was to have a frequency of Exhibitions containing the best work of every school displayed, so as to show it to the best advantage.

In discussing the paper, Mr. BEDDING stated that, although Mr. Bayley had disclaimed any other position as the author of the paper than that of a member of the Photographic Club, he could not help regarding it as a plea for the Royal Photographic Society *versus* the Salon. In brief, Mr. Bayley's contention was, that we should make photographs and not talk about them; but he, Mr. Bedding, thought that the various papers which had been written upon art in connexion with photography (even by people who possibly knew very little about it) had done some good, small as it might be. He said that critics had been described as persons who had failed to produce successfully; but one of the functions of persons who write and criticise is to point out where failure exists. Knowledge cannot be acquired without this iteration, and reiteration, of which Mr. Bayley had complained in his paper. How was art knowledge to be spread if Mr. Bayley's advice were followed? Mr. Bayley, in his paper, had judiciously omitted to refer to the split which had taken place in the Society a few years since; but, in referring to it himself, he would say that he thought the cleavage had been an advantage, possibly, to both parties to it.

Mr. BRIDGE said that he thought the writing of papers on such a wide subject as photographic art would, probably, always commend itself to two classes of people—viz., secretaries who wanted matter for their meetings, and editors who wanted copy.

Mr. SINCLAIR was fully in accord with the remarks which had fallen from Mr. Bayley. For himself, he admitted that he had learnt more by seeing good pictures than by reading about them. He contended, however, that a photographic Exhibition should be representative of art all round, and not of the art of a clique.

Mr. HAES said that we must largely be guided by the standard of art of the times. He said that many pictures were admitted now to the Royal Academy which would not have been admitted some years ago, and *vice versâ*. No rule could be laid down as to what was good art. There would always be a fashion, and it would vary from time to time.

Mr. GOTZ emphasised the fact that photography is a many-sided subject, and that photographic art as generally understood was only one part, and perhaps a small one at that.

Mr. WELFORD expressed his disappointment—his great disappointment—at the paper. He expected to hear something which would lead to a good discussion, whereas the writer had dealt with the subject in such a manner as to leave the expressions of opinion almost all of one character. He said that the paper was really only a long tirade against H. P. Robinson and the Salon. As regarded the latter, whatever might be the verdict of postperity, it had accomplished much for the photographic art of this country; every one must work in his own way, and, so far as papers on the art side of photography were concerned, it must not be forgotten that, if there had been a flood of articles upon the art side, the photographic world had been deluged with articles upon technique.

Mr. CHILD BAYLEY, in his reply, said that, as the author of the paper, he must be regarded entirely as a fellow-member in a private club. He had neither the desire nor the power to speak as the mouthpiece of the Society of which he was the servant. He could not accept Mr. Welford's criticisms as being pertinent to his paper. He was glad to be supported in his opinion that more could be gained and learned by looking at good photographs than by reading about them.

Mr. Child Bayley was cordially thanked by the meeting for his interesting paper.

Croydon Camera Club.—No more attractive or profitable evening has been spent at the Croydon Camera Club than on Wednesday, May 20, when that talented and distinguished Russian-American, Mr. NAHUM E. LUBOSHEZ, gave a most animated and graphic series of

SMALL TALKS

upon various photographic subjects. Nothing better could be desired than his little lecture, vivacious and pointed, pithy yet clear, on the way to obtain artistic *portraits which are likenesses*. His description of how the lights of a studio should be arranged was so forcibly put that it will be remembered with advantage by all who were present. How wide or long faces may be produced at will by shifting the sitter was humorously descanted upon. Mr. Luboshez was very severe upon the use of reflectors, which the ordinary portrait photographer is fond of employing in order to help out the shadowed side of the face, and, by aid of quickly sketched diagrams, he explained how such a system produced distortion, which at times was exceedingly grotesque; any how, the face is thereby depicted askew, the eyes being at the same time given a horrible squint. It need hardly be said that such defects are usually not noticed by the ordinary individual, because the negative undergoes revision at the hands of the retoucher. Having explained the foregoing *vice* of portraiture, he proceeded to give *ad*vice upon the way to light a sitter in order to ensure a faithful and fully illuminated portrait. This he demonstrated by using the head of the President as an object-lesson, the members quickly catching up the points thus illustrated by Mr. Luboshez. Another main subject touched upon during the evening was that of bromide printing, Mr. Luboshez detailing with considerable fulness why bromide paper is more adapted to the amateur than many other papers. He also explained why he preferred the iron developer to all other ones, and gave his audience much personal experience which they would not else be likely to get. Greatest interest was evoked by the system advocated of toning the ordinary black image brown. The method described appeared simplicity itself. The print, being developed and fixed in the ordinary fashion, is immersed in a bath of hyposulphite of soda, 10 parts; alum, 1 part; water, 80 parts. The dish is then placed over a convenient source of heat, and with the contained print the solution is heated up to 100 c., when the toning will be complete. Besides the advantage gained by turning the black tone into a brown one, Mr. Luboshez claimed that the bromide of silver, being replaced by a sulphide of silver, made the image more permanent; moreover, immersion in the hot bath was calculated to extract destructive impurities which might be contained, not in the gelatine coating, but in the paper itself. At the close of Mr. Luboshez' remarks, which were by unanimous desire extended until nearly eleven o'clock, Mr. HECTOR MACLEAN, F.G.S. (the President of the Club), warmly eulogised both the manner and much of the matter of Mr. Luboshez' lecturette, and asked members to accord him their hearty thanks. This, seconded by Mr. J. T. SANDELL, was carried by a full attendance with much applause. The particulars of three Club competitions were announced: —(1) Enlargement competition; Judge, A. Horsley Hinton; (2) Lantern slides; Judge, John A. Hodges; (3) Negatives and prints. Valuable prizes are offered in the above classes.

Hackney Photographic Society.—May 19, the President (Mr. Thomas Bedding) in the chair.—Mr. J. A. SINCLAIR gave a demonstration of

THE ARTIGUE CARBON PROCESS,

and showed that most beautiful results could be produced thereby. Briefly, the various operations are as follows: The tissue is to be sensitised by immersion for two minutes in a two per cent. solution of potassium bichromate, and then dried away from the light. Expose beneath the negative for about as long as for ordinary carbon tissue. To develop, immerse the print in water at 85° to 90° Fahr., until the image shows faintly; then transfer to cold water to stop the action, float on to a piece of glass, and then develop by gently pouring on a mixture of fine sawdust and water at a temperature of 65° or 70°. The mixture should be of the consistence of thick soup, and should be poured on continuously until the image is entirely up. Immersion for ten minutes in a five per cent. solution of alum, afterwards well washing and drying, completes the process.

Liverpool Amateur Photographic Association.—The fourth excursion of the season took place on Saturday last, when a party of twelve members and friends, under the leadership of Mr. James Parkinson, left at 8 a.m. for Chirk,

and proceeded by the tramway to Castle Mill, which was reached about 10.15. A beautiful day was enjoyed in photographing the charming scenery of the Ceiriog Valley up to the picturesque village of Llansaintffraid Lylyn Ceiriog, and about eighty negatives were obtained. Tea at the Glyn Arms Hotel was followed by a drive back to Chirk, and Liverpool was reached about eight o'clock.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

BROMIDE PAPER FOR NEGATIVES.

To the EDITORS.

GENTLEMEN,—As a dealer and an amateur, I heartily endorse "W. R. F.'s" remarks in your issue of the 22nd ult., with this addition, Reduction in weight as well as cost.

I have just placed in my slides six 12 × 10 plates, weighing five and a half pounds, and shall have the pleasure of carting this dead weight of glass about.

What is wanted, and wanted badly, is a sensitised film on paper as a means of taking negatives thereon. You may point out to me that there are films on the market securing that reduction in weight so ardently desired; but, then, look at the price! They are luxuries, not ordinary daily food. Why cannot we have slow films at the price of slow plates, and a sensitive film on paper at half the present prices of plates? I am constantly asked why celluloid films are so expensive, and why we cannot have paper films without this messing stripping business.

Messrs. W. & W. are to be congratulated on their new production, but we are still waiting for a paper film, and the manufacturer who places one on the market will find he has "struck ile."—I am, yours, &c.,

Leigh, May 25, 1896. WILLIAM HAMPSON.

CURIOUS FORM OF HALATION.

To the EDITORS.

GENTLEMEN,—I have lately been in the south of France, taking, as usual, some architectural views, and had pretty good success, however making some mistakes as to exposure, of which I may speak to you later on. The reason of this letter is, however, to speak to you of a novel happening, at least to me, and which may be an accident I cannot as yet explain, or it may be some new kind of X rays; but I am sure never to have seen the same before. With the idea of taking a certain class of views, and so as to avoid halation, I got all my plates backed. This gave me very good results with most of my views, but a few of them showed something quite different from the usual however, a halo also, not from a strong front light, but from dark objects, the strong white light not encroaching on the dark subject, but, returning on itself, collected around the darkest parts. I send you by mail, and untouched, three prints which are enlargements from 4 × 5 negatives made to 8 × 10. On the largest one, a white building, you can see all the smallest branches of the tree, and prints against sky or building have a halo on both sides. Another one shows a halo around the palm-tree, the building being in the shade. The third one, a white building, also shows a halo around the persons in front of it. Can you, or some one, explain this? The smaller proofs show the same halo, but less noticeable.—I am, yours, &c., A. LEVY.

Asnières.

[The prints sent by M. Levy very plainly indicate the curious phenomenon to which he refers.—EDS.]

FLUORESCENCE OF DRY PLATES.

To the EDITORS.

GENTLEMEN,—The letter from Mr. W. P. Walker in your last issue calls attention to a very interesting point in Radiography. I do not think any one prior to Mr. Walker has thought of employing a dry plate as a cryptoscopic screen, but the fluorescent properties of both dry plates and the glass and gelatine employed in their manufacture are well known. Nearly all glass is more or less fluorescent according to its composition, and most important according to the temperature and duration of annealing. Gelatine itself possesses this property in a marked degree, and, curiously enough, the source and method of manufacture of various samples seem to affect it.

Let your correspondent take *any rapid dry plate*, and expose it in contact with a luminous calcium sulphide tablet for, say, half a minute or a minute; on separating them he will observe a marked fluorescence from the plate which lasts visually for some little time. If he sticks a band of paper across the tablet, the phenomenon will be more apparent by contrast.

I have no doubt that Mr. Walker is correct in assuming a very large proportion of the fluorescence to arise from the sensitive film itself. Nevertheless, this phenomenon is not confined to any particular dry plate, but is exhibited more or less by all dry plates, without, so far as I have observed, a single exception. Several batches of Edward's "Cathodal Plates" have exhibited this so strongly as to rival a fluor-spar screen. So far as my observations extend I can support Mr. Walker in the contention that the reduction does not take place from the back of the film. To settle this point, a film which showed this peculiar appearance in the early stage of development was fixed, washed, and dissected, and examination revealed that the reduced silver was fairly equally distributed throughout.

The whole question of the most suitable plates for Radiography is most intimately associated with the property of fluorescence; but hitherto, of a large selection of materials (celluloid, tin ferrotype plate, aluminium, zinc, &c.), glass alone seems to give the finest results.—I am, yours, &c.,

The Grove, Hackney, London, N.E., May 23, 1896. J. B. FINDLAY.

CHLOROPHYLL.

To the EDITORS.

GENTLEMEN,—"Orthochromatic" is wrong in thinking that I ever stated that chlorophyll might be employed successfully "in" a collodion emulsion, or that it would be effective when the plates were dry. The glass plate must be flowed with a collodio-bromide emulsion which contains no free silver; then, when set, flowed two or three times with the alcoholic solution of chlorophyll, and finally immersed in water to precipitate the chlorophyll within the film. The plate must be exposed while wet, as the colour sensitiveness is destroyed by drying. Such plates are not more sensitive than the Cadett spectrum plate, and have the disadvantage that they will not bear such long exposures, because it will not do to let them get dry; otherwise the results are about the same.—I am, yours, &c., F. E. IVES.

24, *Southwick-street, Hyde Park, London, W., May* 22, 1896.

AN ABSCONDING OPERATOR.

To the EDITORS.

GENTLEMEN,—Will you please give a description of a man who is likely to call on photographers for retouching, or else he will use the camera, &c., which I sent him out with on Monday, and which he has not brought back. To-day I have been all round where he was sent, and he has not done any work there. In the morning I shall have a warrant issued for his arrest. The following is a description of him:—

Man, about thirty-eight, dressed in blue-serge suit, hard hat, collar, and cuffs, rather red face, sandy hair and moustache, has Oxford shirt which shows below the collar; will most likely call on photographers for retouching, or else he seen with the following camera:—

Lancaster's half-plate instantograph, without shutter; small spirit level on top. Has two double dark slides, numbered, in black lead on the bottom edge, 1·2 and 3·4. Slides are carried in black cases, which have small ivory tablets on one side for writing on. They are numbered between seven and twelve. Tripod has one stretcher pin loose, and a small split on the inside edge, where one of the stretchers go. Black-velvet focussing cloth, and small black Gladstone bag, with nickel clasps. Has most likely walked into Surrey.

If you can help me in any way to regain apparatus, you will greatly oblige.—I am, yours, &c., A. W. HOLLIDAY,

Photographer and Picture-frame Maker.

Market-street, Alton, May 19, 1896.

THE CARDIFF EXHIBITION.

To the EDITORS.

GENTLEMEN,—Where must the line be placed that separates the amateur from the professional? It has hitherto been understood that *when money is taken for work done* the amateur ceases to be, and the professional area is entered. The Cardiff Exhibition contains a photographic studio ostensibly run by amateurs, but *money is taken there for work done.* Has the line been cut, sir? If not, it has "sagged" awfully, and the "slack" requires hauling in.—I am, yours, &c., A. HORTON.

Central Studio, Caroline-street, Cardiff, May 25, 1896.

ASSISTANTS AND THEIR GRIEVANCES.

To the EDITORS.

GENTLEMEN,—I desire to add my vote of thanks for the excellent leaders on the above subject, published in your issue of May 15, in which you sympathise with their demands; and I am sure all assistants will recognise this, they owe a very signal debt to the Editors of the JOURNAL for exposing the sweating and bullyings which are carried on by those cheap firms. If the letters published in your columns from time to time are from assistants who have suffered from the treatment meted out by the principal of a firm of cheap photographers (of whom I have

had a slight acquaintance), they are by no means "overdrawn." It would be impossible here to detail all the petty acts of tyranny and injustice practised by this firm on their assistants which have come under my notice. Should this firm still refuse to yield to the demands of their assistants for better treatment, the name of the firm should be published. They would then have to face the music, which would be a bad omen for them.

The public who patronise these cheap firms believe the assistants employed by them have comparatively easy work. Short hours, long holidays, good salaries, and in short, by comparison, with many other workers, that they are a class that live in "clover." The truth is that operatives' and assistants' work is in the highest degree exacting and nerve-wearing; that, with exceptions of the comparatively few operators mentioned in your leader with a salary of two or three hundred a year, it is miserably underpaid work. It is the "mere lads" mentioned in "A Retoucher's" letter, who, after a little learning, fancy they are competent operators, &c., who over-stock the labour market, and reduce the rate of pay with regard to the "Polytechnic photographer." It is a well-known fact that one institution turned out large numbers of young men who, after going through a three months' course of printing (fee 10*s.* 6*d.*), rush on the market as printers; meanwhile the benefits offered by a Union are becoming more widely understood and appreciated, and assistants should strain every nerve to form one. It will be a good thing for assistants, but like other good things they are not to be had or kept going without money, and I think a special effort should be made to finance a Union by means of a subscription list, say in the JOURNAL, assistants could send in their loose cash, which they would probably not spend otherwise so well. Failing this, I trust assistants generally, and especially Mr. Randall, will not relax their efforts to promote the establishment of a photographic assistants' branch of the Shop Assistants' Union.

The essential point is that twelve (according to Rule XXXIII. of the Shop Assistants' Union) capable and energetic assistants should be formed to start a branch with, who will, first of all, do the necessary hard work, and who will, in the next place, understand and trust each other. Can photographic workers supply this need? If they can, much may be achieved, and in this, as in most other lines of effort, to be faithful and effective in small things is the best avenue to success to form a Union on the larger scale. It is therefore profoundly to be hoped that operators and photographic workers generally will respond heartily to the opportunity and the generous conditions extended to them by the Shop Assistants' Union.—I am, yours, &c.,

London, May 25, 1896. FRANK BRISLEY.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

John Patrick, 52, Coniston-road, Edinburgh.—*Photograph of Birth-room of Thomas Carlyle, Arched House, Ecclefechan, N.B.; Photograph of Thomas Carlyle's Study, Craigenputtoch, Dumfries-shire, N.B.*

SALARY.—"BOB." Your query was answered last week.] Do you not read the JOURNAL?

COMPOSITION.—E. G. RICHARDSON. We do not know the composition of the material mentioned. We imagine it is a trade secret.

EMPLOYMENT IN DRY [FACTORY.—L. COOMBE. Sorry we are unable to help you. We know of nobody who is about to start in the manufacture of dry plates.

LOAN OF APPARATUS.—W. B. W. We believe that Messrs. Sands & Hunter, and Morley & Cooper let photographic apparatus out on hire. We are not aware upon what terms.

C. S.—The article is clear enough, if it be followed. Any good optician, who makes microscopes, will construct the apparatus for you—Messrs. Ross, Dallmeyer, Perken, Son, & Rayment, or Wray, for example.

PATENT TITLE.—TRADE writes: "If I take out a provisional patent, cost 1*l.*, and do not complete it, can I mark the article 'Patent' for trade purposes?"—Certainly not. If you did so, you would render yourself liable to a heavy penalty.

PAPER FOR WOODBURYTYPE.—T. BALL. We are not sure that paper, ready for use, for Woodburytype printing is to be purchased in this country; we think not. Possibly, however, Waterlow & Sons may supply it; if not, you can obtain it from Liesegang, Düsseldorf.

PARAFFIN *versus* GAS.—A. MACINTYRE. A paraffin oil stove for heating is far preferable to a gas stove in a room where silver paper and carbon tissue is dried. The fumes from the former, though unpleasant, are far less injurious than are those from the latter, though there is no smell with them. If the oil stove is kept clean and the wick in trim, there will be little or no smell.

BRONZE-EDGED MOUNTS.—SIMON. The chemist has deceived you; the edges of the mounts are not gold at all, but ordinary bronze. This you can prove for yourself by touching the "gilt" with a weak solution of nitrate of silver. Return the mounts, and demand your money back. Any respectable photographic dealer would have supplied gold-edged mounts for the price you paid.

DAMAGED LENS.—C. CHARLES. Apparently nothing worse has happened than that the two glasses have become uncemented through the balsam giving way. We do not recommend novices to attempt recementing lenses, though it is a simple operation if the glasses are not burnished in thin cells, which most lenses of the rectilinear type are. Send the instrument to any maker of photographic lenses, and he will do the work for a very small sum.

COPYRIGHT.—J. H. JONES says: "In your issue of July 10, 1891, in the column headed 'Answers to Correspondents,' you will find a notice that I registered two photographs of model of house in which Nelson was born. Will you please inform me whether the copyright has run out; and, if not, what steps I must take to renew the same?"—The copyright has not run out; it will last for your life and seven years after your death, counting from date of registration.

LENS FOR PORTRAITURE.—W. S. B. writes: "Would you kindly say what would be the best lens to use to take a full-length cabinet in a studio that will only allow twelve feet from sitter to lens?"—No lens that has yet been constructed will take a full-length portrait in so short a distance with good perspective. The question simply resolves itself into one of covering power rather than form of lens. A lens of about seven and a-half inches equivalent focus will be necessary, and will have to be stopped down until sufficient covering is obtained. Possibly a lens of the "extra rapid" type will be the best.

STEAMING SHOW-CASE.—SPECIMEN writes: "I am much troubled with steam on the inside of my show-cases. As soon as the sun gets on them the glass is covered with dew, and the pictures cannot be seen. Is there any remedy?"—There are two. One is to have plenty of ventilation in the case, so that the moisture can escape freely; the other is to thoroughly dry the mounts, pictures, and backboards, and then hermetically seal up the cases so that no moisture can gain access. In this case the backboards should be thickly painted so that they are impervious. The latter is the better plan, as then the pictures are the better preserved from fading.

VARNISH TO BE APPLIED COLD.—W. REED says: "The other day I watched an itinerant photographer at work, taking glass positives. After the portrait was taken, he recommended the customer to have the portrait varnished, to preserve it—additional charge, 3*d.* I noticed that the varnish was applied to the cold plate, yet it dried quite glossy. Can you tell me what varnish it was, as it ought to prove very useful for negatives?"—Probably the varnish was simply dammar resin dissolved in benzole. That is what is generally used for glass positives. It is not, however, a very durable varnish for negatives, as it will not bear rough usage. A very hard varnish, to be applied cold, can be made by dissolving amber in chloroform, but it is necessarily expensive.

YELLOW PRINTS.—E. PARKS asks: "What is the cause of the yellowing of the enclosed prints? it made its appearance while prints were in washing under running water between aluming and toning; also the cause of the metallic stain? I have been using P.O.P. for about three years, and never had it appear before. I have lost about eighty prints out of one hundred and fifty, is there any way of taking out yellowness? I have thought that it has been caused by the silver and alum not being properly washed out. When washing my prints after fixing, I change them from one dish to another for two hours, each change taking about ten minutes; is the hypo likely to be washed out in that time?"—The stains are due to faulty manipulation—in all probability from the prints being washed in a dish, or water, contaminated with hyposulphite of soda. There is no way of removing the stains. The washing after fixing will be sufficient if plenty of water be used.

SPOTTY PRINT.—L. B. asks: "Can you give me any information as to the development of the small white spots on the enclosed print? There are several of my photographs, in the same album from which this was taken, gone in the same way, but most of the others are all right. I have a print myself from the same negative as the enclosed which is in perfect condition, and was printed at the same time. It cannot be from any negligence on my part, I think, as I am most particular in fixing and washing. The album is a very common one; and I use gelatine as a mountant. I might also add that the photograph will not be above twelve months old."—There are so many causes that will conduce to spots like those on the print sent. The mere fact that the one sent was kept in common album and became spotty, and another that was not so kept did not, will not, we think, account for the spots. If the two prints were identical as regards mounts and mountant, the cause must be sought for in the manipulations.

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EX CATHEDRÂ.

Messrs. Cadett & Neall are issuing with their price-list of dry plates some interesting particulars relating to their recently introduced "Spectrum" plate. They enclose a copy of the colour chart which is given with Cassell's *Technical Educator*, as well as a reproduction in half-tone from a negative on a "Spectrum" plate of the said chart. No more effective method could be chosen for demonstrating at a glance the power possessed by a plate of more or less correctly translating colour values into monochrome.

* * *

As regards the manipulation of the "Spectrum" plates, Messrs. Cadett & Neall say: "Where perfectly orthochromatic results are desired, a light yellow screen must be used. With the following light filter all visible colours are rendered correctly according to their luminosities. The filter should be made with a cell one-eighth of an inch thick internally, containing a solution of pure chromate of potash, one part of the salt to 250 of distilled water, made slightly alkaline with pure caustic potash or carbonate of potash."

The entire manipulation of the plates, Messrs. Cadett & Neall state, should be carried out in total darkness until the negative is nearly finished in development, when a moderate amount of the dark-room light may be cautiously used. The "Spectrum" plate is stated to be very slow, but we understand that Mr. Cadett will shortly have ready a plate of much greater rapidity, with the same colour-rendering properties. In passing we rank it as a tribute to the enthusiasm of the manufacturers that the plates appear to have to be prepared under as great disadvantages of illumination as are necessary for their development.

* * *

The Speaight Studio is the name given to a new studio which Messrs. Speaight have just opened at No. 178, Regent-street—premises that were, we believe, formerly in the occupation of Messrs. Lock & Whitfield. Much skill and taste have been expended in the decoration and adaptation of the various suites of rooms, which comprise the usual reception, waiting, and dressing rooms, studio, dark rooms, and various other rooms devoted to the actual production of the photographs. The "colour scheme" adopted creates an impression of elegance upon the mind of the visitor, a light tint pervading the decorations and furniture. The studio struck us as being extremely well appointed, the accessories are in good taste, and the backgrounds judiciously chosen to give natural effects. Messrs. Speaight, whose work is of good class, have a moderate scale of charges, and we hope will receive a profitable share of the public patronage.

* * *

Replying to Mr. Hill, who, in our correspondence columns, a fortnight ago, expressed some anxiety to know when M. Jarchy, photographer, of Union-road, Rotherhithe, would hold the baby show he expressed, so long ago as last September, an intention of holding, we have received from M. Jarchy a letter which, we regret, is couched in terms that render its publication inadvisable. To say the least of it, M. Jarchy is very frank towards his interrogator. However, he has been kind enough to state when the baby show will be held. Thus:—"No. 1. A Baby Show for the Competition of Beauty, Health, and Weight, will be held as soon as M. Jarchy can secure 1000 children to select from."

* * *

"One thousand children to select from" is, if we may quote one of the favourite locutions of the day, a large order; still,

with perseverance and a little inducement to the mothers of the small people to come forward, we see no reason why M. Jarchy should not succeed in his object. We wish him a speedy realisation of it, and trust to be favoured with an invitation to the Exhibition—when it is ready to be opened.

* * *

The old grievance of the war of prices crops up again in the letter of a country correspondent. "What can be done," he asks, "by the Royal Photographic Society when a member treats his profession in this manner?" He refers to the bold advertisement of a firm of photographers, in the same town as himself, who announce that during the month of June they will take first-class photographs at half price on certain days. This is a matter in which the Royal Photographic Society, cannot interest itself for the simple reason that the regulation of photographers' charges does not come within its scope. The half prices in this instance charged are 10*s.* 6*d.* per dozen for cabinets, and 5*s.* 6*d.* per dozen for *cartes;* and the prices are certainly low, but we could point to numbers of cases in which they are lower. As to the main question involved, experience shows that the unreasonable lowering of prices ultimately retards, rather than advances, business, so that the wisdom of such competitive methods is not obvious.

* * *

Mr. W. Brown, 9, Gilmour-street, Paisley, writes with reference to our note in a recent number of the Journal as to a skin complaint being caused by hypo: I may say that I have suffered from the same for some years, and blame the pyro and ammonia as the original cause, although hypo will irritate the complaint; indeed, long working in cold water will revive it after once started. To prevent it in the first instance, I think it advisable to lift plates from the solutions with a thin, flat crochet pin; I have tried many remedies, but the following is the only one which has been effectual with me, and for which I am indebted to a photographic chemist. Before using, wash the hands with Castile soap or coal-tar soap. Liniment of iodine, say half ounce, one or two applications with brush or cork will dry up the disease. To relieve the irritation and to prevent a return of the complaint, I use always after developing, and when troublesome, the following wash:—

Carbolic acid	1	drachm.
Wright's coal-tar solution	½	ounce.
Glycerine	3	drachms.
Water up to	12	ounces.

EXPERIMENTS UPON HYPO RESIDUES.

We return again to a topic before dealt with in this column, in the hope that a set of experiments we have made will throw further light on the practical aspects of the subject, and lead to a proper appreciation of a correct mode of treatment in which all the metal may be recovered. It is one of the most remarkable facts in connexion with photography on a large scale that, notwithstanding all we and others have written and said on the subject, there still remains a large majority of workers who never attempt to recover the silver from waste hypo fixing solutions, and, of those who do attempt it, a large proportion go about the operation in the wrong way. In proof of the former assertion, we may say we have been informed, by one of the principals of what is, perhaps, the largest portrait publishing firm in the country, that they never, under any circumstances, attempt to recover the silver from waste hypo solutions. We were almost incredulous, till we were assured again that all the waste hypo went down the sink. It was not for us, of course, to ask so close a question as to the amount of silver used; we think we should not be over-estimating if we said that a hundred pounds sterling would not cover the value of the metal thus wasted.

Let us repeat what we have said before many times. Taking ordinary home-sensitised albumenised paper, the silver recovered from the washings of the prints will not be equal in value to that obtainable from the fixing solutions. Taking ready-sensitised albumenised paper, the washings are not one-fifth the value. Taking P. O. P. or collodio-chloride papers, there is still less precious metal in the washing waters. With regard to the latter there is apt to be some misconception, for there is usually a considerable milkiness produced in the water the prints are placed in to soak; but this is not silver chloride, but baryta white, used in the manufacture of the paper.

Turning now to a consideration of how to obtain the silver from the hypo, there are three leading plans in vogue, where the hypo is treated at all. They are, firstly, the addition of strong acid; secondly, the suspending of strips of metal, such as zinc; thirdly, the addition of solution of liver of sulphur.

We have been surprised to learn how often the plan is adopted of adding strong acid to the hypo, and our hearers are usually surprised, and generally incredulous, when we inform them their method is useless as usually worked. We are told in reply that, so far from the silver not being thrown down, there is a large amount of precipitate produced. The answer to this is, that the same precipitate would be seen if perfectly fresh, unused hypo solution were experimented with. The precipitate obtained in the usual manner is neither more nor less than sulphur, with possibly a slight, very slight, percentage of silver and some gold. So persistent is the idea of the value of this precipitate from hypo, that we determined to make actual trial, and give our readers the benefit of the experiments.

Having in our possession several gallons of old fixing baths, we started by adding pure hydrochloric acid, sp. gr. 1·42, in a measured quantity. Though, in actual practice, commercial acid would be used, the results with pure acid would be the same, and there would be no fear of the presence of the iron usually found in the crude acid masking the simple reactions. We used what we thought would be a maximum quantity in practice, five fluid ounces to a gallon. In a very short time the solution became cloudy, and shortly afterwards a dense, dirty, yellow precipitate was visible. Leaving this to settle, we, at the expiration of twelve hours, drew off a portion of the supernatant fluid and filtered it. Upon testing it, after neutralisation, with sulphydric acid, we obtained a dense precipitate of sulphide of silver, and when testing it in a diluted form the indications showed little, if any, diminution in the amount of silver originally present. We then increased the amount added to half a pint of acid to the gallon, without any alterations in result of the experiment. Next we added acid at the rate of fifteen ounces to a gallon, a quantity that is not likely ever to be used in practice. Still the silver remained in solution, and the precipitate was more difficult to deal with, as a portion floated upon the surface of the solution. Finally we added a pint of acid to the gallon: result, sulphur, very dirty-looking, thrown down; almost all the silver left in solution.

We had by this time very little hypo solution left, so we

added the hydrochloric acid to a small quantity, almost an equal measure of each, acid and hypo; then, and only then, did we find, after a day's rest, that the supernatant fluid contained no silver; all the hypo was decomposed, in fact, and there was nothing to keep the silver dissolved. We obtained a large mass of precipitated sulphur, with a small quantity of silver mixed with it.

It is, however, quite plain that such a proportion as this is never used in practice, and would indeed be absurd. Hence we can only repeat what we have said before, and now more strongly in the light of these actual experiments. It is useless to attempt to recover silver from hypo by means of the addition of strong acid. We have so recently written upon the use of liver of sulphur, that we need not again refer to it, except to say that, though offensive in smell for a brief time, its action is as perfect as that of the well-known kitchen salt for precipitating the chloride from first washings of albumenised paper prints.

ORDINARY DRY PLATES FOR PHOTO-MECHANICAL WORK.—II.

We do not intend in this place to indicate the remedies for this state of affairs,* chiefly because, in using plates of the highest rapidity, we do not think any remedy possible under the most favourable circumstances. We mention the conditions simply in order to emphasise the fact that, while the collodion plates were workable, the only moderately rapid gelatine ones were not. The internally reflected light, while not powerful enough to seriously affect the collodion film, which is notoriously insensitive to weak radiations, was more than sufficiently so to destroy any chance of success with gelatine, though far removed from the highest stage of sensitiveness.

After this digression we will proceed to describe the manner in which we succeeded in perfectly adapting these gelatine plates to our purpose, even without any material alteration of the other conditions beyond masking the margin of the subject, which still cast a considerable amount of reflected light into the camera. The specially prepared photo-mechanical plates, as is well known, are much slower than the slowest in ordinary use, and we consequently set about reducing the sensitiveness of those in use.

The first attempt made consisted in immersing the gelatine plate in a solution containing sixty grains of bichromate of potash and thirty grains of bromide of potassium in ten ounces of water for three minutes, afterwards washing thoroughly, and, after draining, exposing while still wet. This, we had anticipated, would have materially reduced the sensitiveness of the film, but the result was in no way different to what we had already obtained, and, on trying a plate so treated side by side with another not treated, beyond a scarcely perceptible increase of clearness in the shadows, there was no difference. The same treatment, in fact, applied to a plate of greater rapidity, which was liable to a slight veiling in development, actually had the effect of increasing its rapidity, for by removing the tendency to fog without directly lowering its sensitiveness, as we should have expected, it permitted the development to be pushed further, with the result indicated.

Although this treatment failed in reducing the rapidity, as we had expected, it provides a means by which deteriorated or foggy plates can be brought into a utilisable condition, and, as such, it will be found most useful; and, where such plates are to be eventually lowered in sensitiveness, it should always be applied as a preliminary treatment, as the first essential is an absolutely clean film.

The next attempts were made to lower the sensitiveness by impregnating the film with a more or less dilute solution of bromide and iodide of potassium alone and in combination and conjunction also with gallic acid, which is known to have a very powerful slowing action; but whether it is a slowing action on the plate itself, or only a retardation of development, has not been satisfactorily decided. This gave a better result, but still not what we required, even when the plate was treated with a cold saturated solution of gallic acid, with two grains of bromide and half a grain of iodide of potassium to the ounce. The plates were allowed to soak in this solution for two minutes, drained, and exposed without washing, and, though considerably "slowed," were not placed beyond the influence of reflected light.

We then remembered an experience of several years back with a batch of commercial plates, which were subsequently found to contain traces of bichromate of potash used in their preparation and not completely washed out. These, when applied to landscape purposes, gave the most perfectly graded and most brilliant images it is possible to imagine, and with an ordinary exposure; but, beautiful as the image appeared before fixing, it disappeared almost completely in the hypo, only the high lights remaining with any strength; indeed, it was only the sky or white objects in sunshine that retained any density sufficient for printing purposes. Increase of exposure had not the least effect on the shadows and half-tones, though, by such treatment, the highest lights increased in density, while the half-tones almost disappeared, and the shadows became absolutely clear glass in fixing.

This suggested the lines upon which to proceed in adapting our dry plates to the requirements of line and and half-tone work, and, after a few trials, we succeeded in obtaining results quite equal to any obtainable with the specially prepared photo-mechanical plates. The precise quantity of bichromate to employ must be very small, and it will vary with different plates; some will bear or will require more than others. It is applied by simply soaking the plate for a given time in a solution of known strength, and draining without washing. Half a grain of bichromate to the ounce we have found a suitable average strength. If the solution will not drain evenly off the plate, it must be blotted off with a pad of linen or cambric, or unequal action will result. We hope to report further of this process after more extended trials.

The Best Form of Crookes' Tube for Röntgen Work.—Just as in the earliest days of photography the form of lens to be used was the least important consideration, so, with Röntgen photography, the marvellous nature of the results almost overwhelmed every other thought but that of photographing through opaque objects; but, for some time past, it has been seen that the actual shape of the tube has a most important bearing, first, upon the rapidity of impression; and, secondly, upon the sharpness of outline in the object delineated. For some time past the form devised by Mr. Jackson has been looked upon as the best, and it is stated that this form of so-called "focus tube" is now made use of by Röntgen himself. A large number of investigations have been made upon the subject, both theoretically and practically, with the result that the Jackson form, or one founded on it, proves the best.

A very neat form has been devised by Messrs. Brady & Martin, consisting of a narrow tube in which the concave cathode faces the

* See page 338.

usual platinum plate, but the latter is immediately attached to the anode.

New Form of Tube.—Writing in *La Nature*, M. Gaston Tissandier says that for a tube to give the maximum sharpness three requirements have to be fulfilled: Firstly, the cathode (supposed to be the plane) should be of restricted dimensions; secondly, the bundle of rays from the cathode should strike the walls of the tube at a short distance from the cathode; thirdly, the cathode ought to be sensibly of the same diameter as the tube itself, and so arranged as to form a partition dividing the tube into two compartments. Following upon these considerations, it will be thought that sharp photographs will be obtained with a narrow cylindrical tube containing a cathode of almost the same diameter as the tube, and placed sufficiently deep down the tube as not to be separated by any great distance from the anode or anti-cathodic wall. This form of tube has been employed in an experimental trial and found to give very sharp images. In last week's *La Nature* two illustrations are given, one with the ordinary Crookes' tube and the other with the new form just indicated. The first is very indistinct in outline, while the latter is marvellously sharp and clear. The tube was placed fifteen centimetres (six inches) from the object, and when one minute's exposure was given with a six-centimetre (about two and a half inches) spark coil, a sharp and fairly good image was given Even in one minute a negative was obtained, feeble but sharp.

Röntgen Rays at the National Academy of Science. —Washington Meeting.—Naturally great prominence was given to the New Photography at this meeting, and Professor Rowland's contribution was remarkably interesting and full of suggestiveness. He pointed out that the greatest development of the rays took place when the cathode discharge fell upon the anode, so that a curved-surface cathode, the reflections or molecular bombardments from which fell upon a reflecting surface, preferably of platinum, gave the best results. At the same meeting, however, MM. Michelson & Stratton expressed their views to the effect that the Röntgen rays were similar to the Lenard rays, and that they radiate in all directions from the surface first encountered, and that they do not start from the anode.

Professor Rowland obtained excellent results with a perfect vacuum tube, in which the electrodes were placed within one millimetre from each other. The starting point of the rays is there less than the one-thousandth part of an inch in diameter, and gave a shadow of remarkable sharpness.

Failures with Tubes.—Mr. Gifford writes to *Nature*, detailing certain failures and their causes. At one of his demonstrations two of his tubes that had acted perfectly shortly before entirely failed to act at the lecture. He thought it possible they had been over-worked—it is well known that the "fatigue" arrests their action; but he eventually traced the cause to the fact that the platinum reflector, owing to the unusual length of spark, had become red hot, at which stage they appear to cease to be able to give off the Röntgen rays.

It has been found that, after a tube has been used some time, and ceased to act quickly through the walls of the tube excluding a portion of the rarified contents, it may be brought back to its former condition by gently heating in a Bunsen burner flame, which causes the gas to be rediscarged.

The Whole of the Spectrum Photographed on one Plate.—Professor Liveing exhibited at the Philosophical Society at Cambridge photographs of a variety of spectra in which all the spectrum between lengths 550 and 214 was taken at one operation on a single plate, or, rather, sheet of celluloid. He used a concave grating of ten and a half feet radius, with the slit in the centre of curvature, the slide which held the film forming part of a cylinder five and a half feet radius; the result was that the whole of the spectrum was sharp at one time on the film.

The Explosiveness of Celluloid.—Many stories, chiefly of the *ben trovato* type, have been told with regard to the alleged explosiveness of celluloid, and we recollect with what awe the statements were received by the "lay," or non-scientific, public of billiard balls and artificial teeth, composed of that material, having unexpectedly exploded when used with rather too much vigour. Last week, the *canard* crops up again in a quasi-scientific contemporary, where the story is told of the "explosion" of so harmless an article as a celluloid collar. The driver of a traction engine, we are told, was the victim; he was driving his machine when a spark caught his collar, which "exploded with a loud report," and, seizing the collar to tear it off, he was severely burnt about the hands and face. The account does not explain how it was that, if the collar "exploded," it remained to be torn off; that might have been the cause if it had merely "taken fire," but the "loud report" establishes the case, for the purposes of the story at least, as a genuine explosion.

After many years' experience with celluloid in a great variety of forms, we have yet to meet with an instance of its explosiveness under ordinary, or indeed any, circumstances. That the basis of the composition known as celluloid or xylonite is gun-cotton is quite true, as well as sufficient to establish its dangerous character in the minds of the ignorant and unthinking, but those who are best acquainted with it will be aware how utterly absurd such stories are. That in some of its forms, more especially when on thin sheets or films, it is inflammable goes without saying, but in this respect it is not more dangerous than ordinary paper. It is true that, if a quantity of it got "well alight," to use a fire-brigade expression, it would require prompt and energetic measures to extinguish it; but we think the chances of accidental firing would be less with celluloid than with paper. Let any one who doubts this try the experiment of trying to ignite a celluloid negative and a piece of ordinary paper, and see which takes fire the easier. In its more solid forms, as in thick sheets or slabs, brush handles, combs, and the innumerable fancy articles for which it is now used, it is extremely difficult to get it to burn at all unless thrown into a hot fire. The gun-cotton from which it is made is of the lowest grade of explosibility, and mixed, as the manufactured article is, with a variety of other substances, this quality is scarcely likely to be increased. Those, therefore, who make celluloid negatives need not be alarmed for their safety.

This reminds us of an instance which shows how readily the non-scientific but "clever" mind works in and to its own interests. Some years ago, in the pre-gelatine days, we were discussing with the representative of one of the largest fire insurance offices the question of photographers' risks, and asked why it was that the companies almost unanimously refused to insure negatives at any price. The reply at once amused and startled us, for it was to the effect that photographic negatives formed one of the most hazardous of risks, owing to the glass being coated with a highly explosive compound of gun-cotton! Truly a little knowledge is a dangerous thing.

THE CAUSE OF THE RELIEF IN GELATINE NEGATIVES.

The relief which occurs in a finished negative, produced under certain conditions, must have attracted the attention of a beginner before he has finished the development of his first dozen plates, and yet no explanation of this phenomenon has been given beyond ascribing it to the tanning action of pyro on gelatine, though it is obvious that, if this is the case, the whole of the gelatine should be made equally non-absorbent of water, and we should have no solution of the gelatine taking place such as occurs sometimes when negatives are being developed in a tropical country. Pyro pure and simple has no tanning action, if by tanning is meant rendering the gelatine less absorbent of water, and causing it to go into solution

at a higher temperature than it would if soaked in pure water and warmed; pyro, *per se*, has, on the contrary, a softening action, and if gelatine be soaked in a strong solution of pyro (without addition of any other body), as soon as it is thoroughly saturated with the solution, the shreds of gelatine will gradually coalesce into one soft mass.

That pyro has no tanning action on gelatine we proved by closing one end of a glass tube about half inch in diameter, placing some gelatine in it, and some solid pyro; the open end was then drawn out, and, after filling the tube as full as possible with water, it was sealed. When the sealed end of the tube had become cold, the contents were heated, and the gelatine was found to dissolve at the same temperature, or even a lower one, than did the same sample of gelatine when simply soaked in water, and then the melting point determined.

Gelatine in this condition will not "set" at a much lower temperature than it would if dissolved in pure water; the temperature of the blood is sufficient to cause such a mixture to become fluid enough to allow a bubble of air to pass from one end of the tube to the other when it is placed in a vertical position.

Another tube containing gelatine and a solution of pyro was prepared and allowed to remain at the temperature of the air for some time; it was found that the shreds of gelatine gradually coalesced, and, on placing the tube in a vertical position, the mass flowed from one end to the other like a viscous liquid.

These two experiments, we think, proved conclusively that gelatine is not tanned or rendered insoluble by the action of pyro pure and simple.

Before making these experiments, we soaked some gelatine in a solution of pyro, and tested the temperature at which it went into solution; we found this temperature a little lower than was observed when a sample of the same gelatine was soaked in pure water and its solution point tested. On the following day, a few shreds of the gelatine which had been left in the beaker containing the pyro solution, which was now very dark in colour, were tested, and found to be absolutely insoluble even in boiling water; the tanning action is not due, therefore, to pure pyro, but to the products of its oxidation.

When once gelatine has been stained by the oxidised pyro, we have found it impossible to remove the colour, the gelatine and certain products of oxidation have so powerfully combined that only decomposition of the gelatine will cause it and the colour to go into solution.

In our recent paper on *The Solubility of Silver in Hyposulphite of Soda*, we referred to the fact that, after all the silver had been removed both from developed paper and plates, there remained a brownish-yellow stain, having the same gradation as the original; this stain is due to the combination of the oxidised developer and the gelatine, and this stain is unaffected by the hyposulphite of soda. When a line subject is reproduced either on paper or on a plate, and developed with pyro, the oxidised developer renders the gelatine insoluble where the light has acted on the film, as there the oxidation of the pyro is greatest and thus the gelatine is tanned locally, these particular portions of the film thus absorbing less water and swelling less than the unexposed parts, in which the gelatine not being altered absorbs the maximum amount of water it is capable of doing, and is thus swollen to a greater degree than the tanned portions; and it is for this reason that we obtain relief in gelatine negatives.

About fourteen years ago Mr. Warnerke worked out a process in which the film, after development, was in part dissolved by means of warm water, those portions which correspond to the shadows being soluble in warm water, the portions that correspond to the high lights and half-tones being more or less insoluble. Mr. Warnerke simply gave the results of his investigations, but, as far as we can remember, advanced no theory in explanation of his observations.

It is also due to this same tanning action that gelatine negatives which have been dried swell but little when soaked in water, the oxidised pyro having tanned the gelatine to such an extent as to render it non-absorbent of water; it is thus difficult to dissolve the gelatine from old negatives, as, from the time the plate leaves the developer till it is thoroughly fixed, the pyro which the gelatine contains still continues to absorb oxygen, and, combining with the surface gelatine, renders it insoluble in water even when hot.

In order to ascertain whether the tanning action is due to only partially oxidised pyro, or to pyro which has absorbed as much oxygen as it possibly can by free exposure to the atmosphere, the following experiment was tried. A strong solution of pyro containing carbonate of soda was placed in a tube and air bubbled through it for sixteen hours; at the end of this time, the solution, which had become of a dark brown colour and syrupy consistence, was transferred to a beaker and some shreds of Nelson's No. 1 Photographic gelatine soaked in it for twenty minutes; the gelatine was then washed for about an hour in running water, and transferred to a test tube containing water which was gradually raised to the boiling point, but the gelatine refused to go into solution. On the addition of a few drops of nitric acid and further boiling, the gelatine dissolved to a very deep-coloured solution. We find that, of all the different reagents we have tried, a dilute solution of hydrochloric acid has the greatest power of lowering the temperature at which the pyro-tanned gelatine goes into solution, though, as is well known, a solution of potassium bichromate containing sulphuric acid dissolves it in the cold.

We have noticed, when using some of the more recently introduced developing agents, that in some cases no relief was visible in the negative after fixing and washing, though in other cases it was very marked.

In order to test the tanning properties of the modern developers, strips of gelatine (Heinrich's) were soaked in solutions of the following, rendered alkaline by the addition of a small quantity of sodium carbonate, metol, di-amido-phenol, glycin, eikonogen, hydroquinone, rodinal, and amidol, the strips of gelatine were allowed to soak in the different developers until they had absorbed as much of the solution as possible, which took about ten minutes. The strips thus saturated were attached by one end to a sheet of paper and exposed to the air till thoroughly dry; during the process of drying the gelatine strips soaked in the solutions of amidol, metol, eikonogen, di-amido-phenol, and hydroquinone, became dark brown in colour, the intensity of the stain being in the order above mentioned, the gelatine soaked in the glycin and rodinal solutions being unchanged in colour, though the oxidation was allowed to continue for two months.

Small portions of these gelatine strips were soaked in water for about twenty minutes, and at the end of this time they were placed in test tubes half filled with cold water, a thermometer was then inserted and the water gently warmed, the temperatures at which the different pieces of gelatine went into solution being noted; the following results were obtained:—

Developer.	Temperature of Solution.	Remarks.
Original gelatine	45° C.	
Metol	62° C.	Does not dissolve like ordinary gelatine, but breaks into pieces at about 50° C.
Glycin	45° C.	
Di-amido-phenol	80° C.	
Rodinal	45° C.	
Eikonogen	100° C.	Dissolves slightly on boiling.
Hydroquinone	Insoluble.	Hardly softened.
Pyrogallic acid	„	„ „
Amidol	„	Becomes soft and slimy, but refuses to dissolve.

On examining the above table, we notice that the gelatine treated with pyrogallol, eikonogen, hydroquinone, and amidol, does not dissolve even at the boiling point of water; that treated with metol and di-amido-phenol goes into solution at a lower temperature, whilst the gelatine treated with glycin and rodinal, has not had its melting point altered. From this we might infer that the first-mentioned developers would produce the maximum amount of relief, the second less, and the last none at all; in practice we find that glycin does not give any relief, and most probably rodinal would behave in a similar manner, whilst pyro gives great relief.

We might still further infer that the oxidation products of glycin and rodinal either have no tanning action and are colourless, or that glycin and rodinal do not oxidise when exposed to air even in conjunction with an alkali, and, in order to test this point experimentally, a few grains of glycin were dissolved in water and oxidised by the

addition of a little bromine, then the solution boiled to drive off the excess of the oxidising agent; this produced a slight brown colouration, which, when we had neutralised the free acid produced by means of sodium carbonate, became dark brown in colour, and on soaking some gelatine in this for a few minutes, then washing, and testing the melting point, we found that even at the temperature of boiling water it was quite insoluble. On treating rodinal in the same manner, a similar action was found to have taken place, the gelatine was tanned and rendered insoluble in boiling water. These results show that glycin and rodinal are not oxidised even when freely exposed to air, but by submitting them to the action of such a powerful oxidising agent as bromine, an operation which takes place in the development of a plate, a coloured oxidation product is obtained, which has the power of tanning gelatine, and we would therefore expect to obtain a "relief image" when developing with rodinal or glycin.

It must, however, be remembered that all the modern developers are associated with from five to twenty times their weight of sodium sulphite, when employed as developing agents, the developer merely serving as a carrier of oxygen to the sulphite of soda, the action most probably taking place as follows:—

X	+	2 Ag Br	+	H_2O	=	Xo	+	2 Ag	+	2 HBr
developer		silver bromide		water		oxidised developer		silver		hydrobromic acid

and

Xo	+	Na_2So_3	=	Na_2So_4	+	X
oxidised developer		sodium sulphite		sodium sulphate		developer

This will explain why some of these developers can be used to develop a number of plates, and also why, when these developers are used with a large excess of sodium sulphite, no tanning action of the gelatine takes place, and therefore no relief image is obtained; it will be found that, if a plate be developed with pyro, associated with a large excess of sodium sulphite, no relief image will be obtained, or, if it does occur, it is very much less pronounced than when the sulphite is omitted.

The colour of the tanned gelatine is of a very non-actinic nature and must have great influence on the printing qualities of a negative, and we thus see why a pyro-ammonia developed negative, though apparently very weak and lacking in silver density in the high lights, yields such plucky prints, as, where most silver is reduced, there also the maximum amount of tanning and colouration of the gelatine takes place. Visually negatives produced by the modern developers (with plenty of sulphite) are much denser, but as printers they are often very disappointing, in consequence of the opacity depending entirely on reduced silver; if, however, only a small quantity of sodium sulphite be associated with hydroquinone, eikonogen &c. slightly brown-stained images are obtained with better printing qualities.

When certain of the organic developers are used for the development of plates whose opacities are to be determined on the Hurter & Driffield system, considerable error might be introduced if the reducing agent be not associated with a sufficient quantity of sulphite of soda to prevent the staining of the gelatine.

Any one can easily prove for himself that the image in the gelatine of a pyro-developed plate is not due entirely to silver by placing the plate in a solution of ferrous sulphate; the colour of the image is changed, due to the combination of the iron and the oxidised pyro in the gelatine. In this way negatives, as is known, can be sometimes slightly improved in printing quality.

A. Haddon.
F. B. Grundy.

DIGRESSIONS.

VI.—Is it Good Enough?

This is a question, not without a suspicion of slang, we often ask ourselves, and the value depends upon the seriousness with which we take our work, and the standard we set up by which it may be judged.

The standard is everything. What do we want to be or do? Shall we work or play? Shall our aspirations lead us to the Salon, or is all that we care for to carry a hired Kodak, and our greatest merit be to wait patiently for the finished prints? These two states are as wide as the poles asunder, and the photographer can get hot and cold many times between them.

It is said that the cleverest thing to achieve in any art is to find when success is reached.

I remember the frontispiece of an old *Preceptor* of the last century—I used to look upon this as one of the wisest books—which represented Minerva leading a child up a terribly long flight of steps to the Temple of Fame, where there was a young woman blowing a trumpet in anticipation. He appeared to be an intelligent lad, but not altogether happy; but then he had not climbed very far. In the foreground was a group of children playing in a puddle. "Pleased with a rattle, tickled with a straw," it was good enough for them. As Mr. Slawney would say, this was not altogether untypical.

Eighty out of every hundred, probably, who use photography do not care to succeed beyond a certain point, and it does not come within their scope to have any ambition to succeed. It is not every athlete who wants to get from Marathon to Athens in the shortest time, so why should they try? all that I ask for is that those who really are in earnest should be very earnest indeed. As I have hinted, one of the chief difficulties in the arts seems to be to know when the work is finished. Much depends on what we understand by the word "finished." Any sense of laboured effort has a bad effect on the beholder, except those who admire the lesser virtues, patience and ingenuity and care, which are by no means the essence of art. Indeed, if I were asked what I most admired in the technique of a picture, apart from the subject, I think I should say, *a spontaneous effect based on intention.* I have no sympathy with flukes and happy chances, if they are too obtrusive. A very usual criticism on a picture is, "How beautifully it is finished!" when probably it would have been all the better finished if further labour had been bestowed on effacing all the "beautiful" niggling. I have heard a painter say, "Now I am doing mischief. It would be better to let well alone. It is good enough."

On the other hand, anything like slovenliness must be avoided. This is especially true in our own art. An impressionist painter—a genuine one, I mean—may, and does, take infinite trouble to make his work look as though he had thrown his subject on to the canvas by a mere effort of thought, and by that means produces effects nearer to nature and more beautiful than any other way would afford, but this is the result of real hard work; his imitator, the sham impressionist—the one we see most of and are used to—makes some careless dabs of paint, and says, "How fine," and, helped a little by his own pose, trusts to the ignorance and reverence for fashion of his well-drilled audience to make a fine work of it. Much talk by these kind have done much mischief, but there are other causes of slovenliness.

Genius makes some people careless, but carelessness must not be taken for genius, and there is always the tendency of the black-crow, carelessness, to assume the peacock's feathers of genius; but sometimes genius suffers for not caring sufficiently for the humble means. Two of our most poetical photographers—we have had so few that I need scarcely say I mean Rejlander and Mrs. Cameron—cared little for manipulation, and suffered accordingly; indeed, the beauty of that part of the execution on which the effect depends of Mrs. Cameron's pictures owes much to the accident of what was then called a bad lens, the qualities of the badness of which seem now to attract the admiration and imitation of our best opticians. So the world wags. But she could *see*, and had the sense to take advantage of accident, unlike many of our original inventors of gelatine emulsions and other processes, who, if we are to believe them, had fame and fortune between their fingers, and had not sense enough to close their hands, and we hear a good deal of their "generosity" in giving away processes which never really existed until long after those who had failed to see had passed on, and somebody else had put to use crude experiments that had been allowed to run to waste. It is matter for curious speculation if we should ever have heard any more of early emulsion experiments if Bennett had not stewed his preparation of it. Our experience with the many slow, dry-

plate processes, more numerous in their time even than developers are now, was not exhilarating. We had a few operators who showed that beautiful work could be done with patience; they had to use much knowledge of chemistry and still more common sense. Even then their technique was no better than a pupil can do now the emulsion has been stimulated by fire, and nothing more. A complete list of the old dry-plate processes would show how ingenious and even imaginative we were in those days. Everybody modified everybody else's process, and with great originality tried almost every article of kitchen chemistry as a preservative except mustard and pepper; yet there was some good work done. The gum-gallic and collodio-albumen processes, in the hands of such men as Russell Manners Gordon, Mudd, of Manchester, and Lyndon Smith, of Leeds, produced pictures worthy of any time or process; but their lasting quality (in the sense that you did not tire of them) was due to the artistic knowledge of their makers. The last name I have mentioned is almost forgotten. He died young, being drowned while skating. He was certainly the most poetical landscape photographer of the time, and I think he took the first medal ever offered for photography in Great Britain. Technically, everybody can do better now without much technical study. The ghastliest failure of all the dry processes was the one about which most fuss was made—the tannin. The greatest discovery of the time was alkaline development, first published in THE BRITISH JOURNAL OF PHOTOGRAPHY by Mr. Leahy, of Dublin.

I will return to my subject by making the general statement that a picture has reached the greatest attainable perfection when it is "good enough;" but, when it reaches that altitude, is the problem so difficult of solution? If it goes beyond that uncertain point, degeneracy begins to set in,—

> "To add another hue to the rainbow. . . . .
> Is wasteful and ridiculous excess."

The question then, "Is it good enough?" should always be kept in mind, and be the touchstone of all you do. It is just possible that in course of time you will find yourself—being your own judge and jury—letting yourself off rather easily; this must be checked. Pass some unmerciful judgments and smash negatives; also think of the court of appeal, for which you may take the exhibition.

The question "When is a picture finished?" has caused much controversy. Mr. Whistler is one of the few who have endeavoured to reply. He says:—

"A picture is finished when all trace of the means used to bring about the end has disappeared.

"To say of a picture, as is often said in its praise, that it shows great and earnest labour, is to say that it is incomplete and unfit for view.

"Industry in Art is a necessity—not a virtue—and any evidence of the same in the production is a blemish, not a quality; a proof, not of achievement, but of absolutely insufficient work, for work alone will efface the footsteps of work."

In which is great wisdom if you read it rightly.

It is a very usual thing to say, I often say it myself, I hope with discrimination, "Never be satisfied." But I am not sure it is not like playing with edged tools. To wait for perfection is to lose all. It is better to do well what is possible, or even easily possible so that it is good enough, than to cry for the moon and fail. The most perfect state of mind for a photographer to attain is that which enables him to see instantly what will make a good picture, and to possess the courage to secure it without more ado. I am afraid that many photographers proceed in a very different manner; they may have eyes to see a good subject, but cannot satisfy themselves that it may not be made better, then they hesitate, and confusion sets in. They have come to the end of their knowledge, the crowning knowledge, which teaches them that it is good enough.

But to act with decision is nearly always only to be attained by long experience. The greatest painter I ever knew, and far and away the greatest true impressionist, put his picture on to the canvas in an incredibly short space of time; every touch was *right* in tint, and tone, and place, and never retouched, but all this was the result of the most minute study for very many years. I knew him from his early days, when he was an enthusiastic pre-Raphaelite, and, if he covered a square inch of canvas in a long day's work, he knew he had done well. In his later years his decision was absolute, and his painting almost as sudden as a snap-shot, but with this difference, every touch was applied with assured intention, while, I am afraid, the certainty of absolute intention seldom presses the button. This swiftness and certainty of touch could only be won in perfection, as my friend won it, by painful study and something very like hard labour.

The danger of too high a standard is like the search for truth, a compulsory impracticability is set up, and the result is that nothing is found good enough, and, as with the experimenters, everything ends in talk. Is there not an old song with a refrain that goes something like this?—

> "Little fools will love too much,
> But great ones not at all."

That little sentiment about expresses the situation. In judging whether they are "good enough," the weak, undertrained photographer is apt to take all his geese for swans, but the earnest student often goes too far the other way, and we lose what might have been of value. "When in doubt smash the negative" is a good rule, but there is something to be said on the other side. It depends on your temperament. If you trust yourself not to be too lenient, it may be well occasionally to put a doubtful negative aside for a month or two for further consideration. There is a household saying: "Put it away for seven years and it may come useful; if not, try another seven." Here is an example of how the saying has worked. After my pot-hunting days were over, when Exhibition committees racked their brains to find numerous classes for the encouragement of the worst photography, under the excuse of helping the young, I experimented in the direction of taking just another medal. To have any success, I found I had to look up some pictures that were cast away twenty years ago, which I did with success. They were "good enough;" better would have failed. I ought to add that, although the exhibition to which they were sent was a large one, there was no room for my newest and, I think, best efforts. They were not wanted. So photography was encouraged. H. P. ROBINSON.

FORM

How many otherwise good pictures are spoiled, or, at any rate, their appearance considerably impaired, by inattention to their shape, it is difficult to say. The final trimming may make or mar the result. A very presentable picture may frequently be cut from one which, if left of the original size, would be fit for nothing but the residues. So, if Röntgen rays, kinetoscopic projections, and colour photography have not hustled out every other subject, a word or two about trimming and form may be profitably considered.

Enlargements especially suffer from being left of inartistic proportions, there is such a disinclination to cut down for no fault but superfluity of subject, that the offending portions are retained from sheer reluctance to destroy beautiful detail, although that detail may, if left, seriously damage the appearance and art value of the whole subject. After practising photography for many years, I have experienced the feeling myself, and with sundry spasms of regret have sliced off little by little part of a pretty foreground until the picture was depleted of the full amount I had in the first instance thought would be necessary to remove. No matter how crisp and full of light the portion may be, providing it interferes with the proper balance of the subject, the shears must be ruthlessly applied, shutting our eyes to everything else but artistic form, which must, if possible, be secured at almost any cost, if we mean to have a picture and not merely a photograph. Of course, providing our work is a mere topographical representation, there are other considerations perhaps more important than the purely artistic, at the same time we must go as near as possible to the correct form, as a judiciously trimmed print will make as much better of an awkward subject as a badly trimmed one will make worse of it. Photographers more frequently err in respect of an unsuitable proportion of foreground than in any other manner, it may be too little or it may be too much, frequently the latter, especially when the idea is to get a picture the full size of the plate. I believe it is almost impossible to decide precisely and definitely as to the exact amount of subject that will make the best picture, by examining the image on the

focussing screen. It is not until we have the print before us that we can satisfactorily do this, and even then it takes more consideration than might be supposed would be necessary, masking off a slice here and a slice there until the final shape is determined upon.

The fact of having become accustomed to work with plates of definite sizes, and making our photographs to fill them up as much as possible, irrespective of other considerations, has been a prime factor in fostering the disinclination to cut the prints down. Mounts, too, being made for quarter-plate, half-plate, whole-plate, &c., sizes, has also influenced the makers of negatives and prints to make them to correspond with the mounts. I am not aware that any mounts are in the market that are not made in accordance with the usual sizes of the plates; that is, if we purchase them ready-made, with paste-down or lithographed tints, or ornamental lines and borders. A plain board will, of course, suit any shape, but a print, quite different in proportion to the usual tints, looks very ugly when attached to them, unless the prints are very much smaller than the tints they are laid on. Taking one size with another, I am inclined to think the general run of photograph is too square for landscape pictures, a somewhat longer shape would be preferable. However, this is a mere matter of taste, and is also in a measure regulated by the subject itself, or ought to be to a much greater extent than it is. When suitable, one of the advantages of a longer form is, that it increases the effect of extent. The shape termed panoramic gives the widest obtainable by trimming, and very often a photograph of this kind may be cut from a squared form with advantage, making a good picture, when the original was unsatisfactory. The proportions of a panoramic picture may be anything more than having the length twice that of the width. It is especially suitable for sketches of flat country, or river scenes when there are no tall objects in the near or middle distance; if there are, we are almost bound to adopt a square form. It is very seldom that a picture looks its best when the width equals its height; perfectly square or circular forms are only occasionally useful in landscapes, and even then the square is a doubtful advantage; probably the same subject in an oblong or oval would have a more pleasant appearance.

If we examine many artistic and delightful etchings and engravings, we find a portion bounded by the segment of a definite circle, or eccentric shape, and the rest vignetted; then, the outside form is unimportant, and is adapted to the exigencies of the case. In the book, or in whatever it may be mounted, the subject being a rule to itself, and independent of outside trimming. Tall, narrow forms are only applicable to tall narrow subjects, floral or *decorative* photographs, but for ordinary landscapes or portraits they are quite out of place. If three or four of this upright narrow shape are mounted side by side, the conditions are altered, and they assume the more ordinary character, the outside margins or lines of the *whole* impress one with the general effect, and not each individual picture, which singly would appear unsatisfactory, although, together, the effect is pleasant enough. As a rule, the horizon line regulates the amount of sky and foreground, the position of which is dependent on the height of the eye of the spectator, but in a photograph this rule is frequently disregarded. For instance, a photograph taken from a great elevation has frequently a much larger allowance of sky than it ought correctly to have; and one taken from a very low point of view may have much more. There is no absolute rule as to the proportion of sky or foreground above and below this line, but one-third of the width of the picture above the horizon, and two-thirds below it, is frequently adopted as a satisfactory adjustment. If the sky and landscape occupy exactly the same amount of space, there is a formality imparted to the picture better avoided,

When the upper part of the subject is well filled with clouds, a new interest is added, and then the horizon line may be lower, with advantage, than were the clouds non-existent. When the subject consists principally of near objects, without any distance, an imaginary line is drawn of the average height of a standing figure, and the print trimmed to suit it.

It is a very common practice to take the interior of large buildings from an unusually high standpoint, which gives an unreal effect, unless there is something that unmistakably indicates the position from which the view was taken. If an unobstructed view can be had from the floor, the general effect is, in my opinion, much better; even if we have to tip the camera, swing the back, and raise the lens, the point of sight still remains the same. There are occasions when something in the foreground has to be left out; that can only be managed by adopting a high standpoint, or it may be the position for which a photograph can be made is so restricted that the elevated position is imperative. This is, however, rather outside the subject of shape, which we are more especially considering, although the amount of floor space and roof has a very important effect on the results. Too much trimmed off the foreground makes a building seem to be sinking into the ground, and too little gives an up-hill appearance, to what should be the level. This up-hill look is frequently seen when churches and similar buildings are taken from a lofty gallery; it is not that the perspective is incorrect, but that the point of sight is unusual, and we get too little foreground to make a pleasant picture. This emphasises the necessity of having the horizon line of a suitable height, so that the perspective may not appear distorted, and applies to all architectural photographs, especially those that have to be taken from a near point of view, for no trimming will get rid of the effect of an unsuitable standpoint.

Whilst on the subject of architecture too great importance cannot be laid on the necessity of having perpendicular uprights obtained only by properly adjusting the *dark slide* so that it is truly vertical and level. In a print in which lines that ought to be upright incline one way or the other the trimming must in some degree be managed to counteract the inclination; supposing they incline inwards at the top, the trimming must be slightly inclined too, which will make the top edge of the print narrower than the bottom; in mounting the top can be stretched a little, so that the want of uprightness of the lines is remedied, and the mounted print will be more correctly rectilinear. Sometimes it happens that the uprights are so much out of truth that it is impossible to stretch the paper sufficiently; in this case the sides of the prints are better left slightly sloped, which will apparently reduce the inclination of the image, and so be better than accurate trimming that would have a tendency to emphasise the fault. Eccentric shapes are to be deprecated, even dome-shaped tops or very much rounded-off top corners interfere with the appearance of the subject; but, as for cushion shape, it should be abolished altogether, it was originally introduced to cut off defective corners, as also was the dome; but since we have cleaner manipulation there is no necessity for perpetuating a decidedly ugly shape. The only place in which such forms are not very objectionable is in the portrait miniature, which will permit the use of such shapes that for other kinds of photographs are quite out of the question; at the same time the trimming of portrait subjects is governed by the same rules as landscapes with a few additional precautions.

The oval form is a favourite one for vignetted heads and busts, and, when the boundary line is not too close to the subject, very suitable; trimming so that the head occupies the proper position both with reference to the centre and the pose is important. As a general rule, the head should be rather above the centre of the picture and never below it, and never trimmed so as to appear pitching forward or backward, as the case may be. If the body is included in the vignette, although the pose may be a leaning one, the picture should be upright; this especially applies to full-length figures. In portraiture, the trimming usually is secondary to the mounting, at any rate it is the determination of the outside boundaries of the subject, so it comes to the same thing. Squarer forms are generally more applicable to portraiture than landscape work; narrow oblongs, either horizontal or vertical, more rarely. In the first, a reclining figure or extended group, and in the second a single standing figure or small standing group are most appropriate. But for all subjects the shape is controlled by the composition as to length and breadth, the only imperative condition is that it shall be symmetrical.

EDWARD DUNMORE.

CO-OPERATIVE PHOTOGRAPHY.

THE photographic trade has expanded considerably of late years, and is rapidly adding to itself all the good and bad features of modern commercialism. This progress is shown by the complaints of employers that work is harder to obtain, profits are smaller, and that competition grows keener every day. The severe struggle to make photography pay is felt by assistants, who are also complaining of worse conditions, decreasing wages, and a general want of consideration in the treatment they receive from employers. Both master and man are seeking to form unions to protect their class against the aggression and sharp practices of the other. All this follows the ordinary laws of commercialism, and comes from the development of photography into one of the ordinary industries of the country. It indicates an advance from the nature of a simple unorganized cottage industry towards that complex and highly organized condition which is manifested in the factory system. The factory system has already made its appearance in some branches of photography, such as enlarging, view work, cheap portraiture, and retouching. Every branch is becoming specialised, and a worker no longer practises the trade throughout, but confines himself to a single branch. Such division of labour leads directly to the factory system, and large firms are becoming common who employ a great number of men con-

stantly working at one thing at which they are very proficient. These men are combined under one head or manager, and the firm thus becomes a most perfect machine for producing the best work at the cheapest possible cost.

This progress towards the factory system is the main tendency of photography; but at the present moment, due to various causes, of which Polytechnic teaching is the chief, there is also a minor movement away from the factory system and division of labour. Springing up everywhere we see a great number of small masters whose existence almost reduces the trade to the condition of a cottage industry. These master men employ little assistance outside their own families, and are satisfied if their incomes are a trifle better than the average wage. However, this condition cannot last, and it is only a question of time when many of these small masters will go down before the advance of the factory system. It only wants the men to arise with a faculty for organization to break up all these small capitalists.

The factory system, although having great advantages over individual production, is one of the evils of modern commercialism; it increases the greed of employers, reduces the workman to a machine, and destroys individual initiative. To remove these evils, and, at the same time, to secure the advantages of the factory system, the principle of co-operation was formulated. That principle maintains that all the workers in a society shall share in the management, receive the whole profits, and sustain the losses. Many so-called co-operative societies are merely so in name and not in principle, but there are also many flourishing societies in which the principle of co-operation is faithfully applied. Whether competing against the factory system or the more enlightened co-operation, the individual producer is at a disadvantage, and, under equal conditions, will be forced out of the struggle.

The majority of co-operative societies are simply distributors, and not manufacturers of goods. A little consideration will show why it is more difficult to carry on a co-operative productive than a distributive society, yet many of these co-operative productive societies are working well and supplanting the usual capitalist and factory system of production. For instance, in the boot trade at Kettering and other towns in the Midlands, these societies are managed, and the stock owned, by working shoemakers, who are, in consequence, much better off both as regards wages and conditions of labour than if working in a shoe manufactory.

A study of these various efforts has led me to the conclusion that similar methods could be most successfully applied to photography, and would add greatly to the prosperity and well-being of the workers engaged. Co-operative photography has never yet been tried, though I believe an attempt was made by a lady at Maidstone to form a society. This is somewhat remarkable, for few trades appear to be so peculiarly adapted to this method of production, and in few trades exist the same proportion of isolated master men who could work more economically and with more profit by combining their resources.

Photography would, of course, come under the head of co-operative production, the more difficult case; but, in spite of this, I will indicate some of the reasons which lead me to think it would add one more to the successes, and not the failures, of co-operation. Many attempts at co-operation have failed through bad work and mismanagement. In a photographic business both these defects can be immediately dealt with and remedied before much harm is done. Bad work carries its own condemnation with it, and bad management soon brings confusion. This confusion from mismanagement comes from the character of photographic work as a continuous process. To produce a photograph our methods must be so adjusted that they work like a well-arranged machine. When once the process is started, the slightest failure in a single part upsets the whole scheme. Operator, retoucher, printer are like the wheels in a watch, all must move if one is started. The sitter once taken, the remaining work must follow to completion. Photography, therefore, is, by its very nature, a co-operative process. This highly organised state of photography reduces the duties of management to a minimum, and we see this in actual practice, for the head of many a large business does the operating himself, as well as fulfilling his duties as manager. In general trade this would not be possible, the work of a manager demanding the whole time and attention of the principal. In photography, however, it is usual to combine the two functions of workman and manager. In a co-operative firm the duties of management could be still further simplified by each section doing its own, and in this way the co-operators would be at little expense for wages of management.

Bad work can always be detected, because, in past work, there is a standard to which present work can be compared; and, practically, it is a simple matter to keep up the quality of photographic work. The check of one worker upon another aids in this result, the operator soon detecting a falling off in the printing, and, a printer being the first to complain of faulty negatives, it is in the interest of each to secure the finest work from the other. By experience it will be found that a photographer can have no more exacting critic than those with whom he is working. From bad work and mismanagement, I see no good reasons to expect the failure of any scheme of co-operative photography, carried out by thoroughly qualified workers; in fact, these two main sources of failure are not such grave objections against co-operative photography.

The first gain from any scheme of co-operative photography would be financial. The principal difficulty to be met in all photographic ventures is the primary outlay for apparatus, accessories, and stock. Economy in these respects cripples all future action, and leads to complete failure; but this obstacle would be readily overcome by the intending co-operators adding their small means and making one respectable total. For example, many an operator or printer commences business with an outlay of about 100*l*. With this amount he is quite unable to purchase a very extensive outfit, and in consequence he is compelled to limit himself to a single class of work. For a large proportion of his trade he must hire apparatus, or put it out to be done, because he possesses no convenience for doing it himself. He is thus paying wages for work he might do himself had he the necessary appliances; but, supposing an operator, retoucher, and printer combine their means and start with an outlay of from 300*l*. to 400*l*., they can commence with a practically complete outfit, able to do all the ordinary work of the trade, and with the conveniences for doing a very large quantity. In the end this will pay, first, because they take the first profit, and the only profit, on all they do; secondly, because, when one branch is slack, another will be busy. The single man loses both these advantages, for he must share with many others the profits on a large part of his output.

A good outfit having once been secured, it will remain in working condition for some years, and the remaining heavy expenses of the business, to be constantly met, will be wages and materials. Leaving aside material, and considering wages, it will be seen that the co-operators would gain on this, the largest item of expenditure in a photographic business. Profits coming solely from the skill of the workmen, and varying with the rate of wages, it follows that, the members having every inducement to display the highest skill, the maximum profit will be made for the lowest wage; but, supposing the operators pay themselves the ordinary wage, they are then obtaining underpaid labour, and their profits swell by the exact amount of the difference between the value of capitalist labour and co-operative labour. Hence, in a co-operative society, in which the skill resides in the owners, the maximum of work is obtained for the minimum wage, and the largest possible profit is made.

In materials, likewise, a saving might be effected, and the waste reduced to the minimum.

To avoid waste of material, and also waste of time, is of first consideration in any business doing a high class of work, and we may be sure that the waste would be the least possible amongst workers who were directly interested in avoiding bad work. Waste of time, in like manner, would be small; every ray of daylight would be utilised, and in no trade is it so necessary to catch the fleeting sunshine as in photography—in fact, it is the first element of commercial success.

A society of photographers, working on co-operative principles, would thus be certain to attain, in a high degree, good work, economy, and dispatch, and these are the elements of success. Management and business acuteness are of secondary importance as distinct factors, for they are contained in the former. Workmen possessing the necessary skill are quite as able to secure the profits on that skill as any of the capitalists, totally ignorant of photography, who is at present exacting his wages of management.

In co-operation might also be found a remedy for some of those grievances of which assistants are repeatedly complaining, for there can be no question that, if nothing more were obtained, the improved conditions of the workmen would repay those who made the venture.

JOHN A. RANDALL.

EFFECTS OF BICHROMATES ON THE SKIN.

[Autotype Notes.]

QUESTIONS are frequently asked at demonstrations of the carbon process, and in the photographic press, as to the ill effects the bicchromate salt is likely to have on its users. As carbon printing is rapidly extending amongst amateurs, as well as professionals, this seems a proper subject to be deal with in *Autotype Notes*. I am one who has suffered somewhat severely from the bichromate, as well as seen its effects, and non-effects, on others. It may here be mentioned that its injurious effects are comparatively rare, for I have many friends, who have worked the carbon process for many hours daily for twenty years and more, who have experienced no inconvenience whatever, while others, after a few months, have suffered severely. In no instance, however, have I known any trouble to arise where the process is worked only on an amateur scale.

The pernicious effects of the bichromate may be experienced in two ways, each distinct from the other; that is the opinion of Dr. W. B. Richardson, who has gone somewhat deeply into the matter, and my unpleasant experience quite confirms it. The first form is from the use of cold, strong solutions, such as those used for sensitising carbon tissue, paper for photo-lithography, &c.; the other from warm, dilute solutions, such as result from the continuous development of carbon prints in the same water. The former is only likely to cause trouble when there is an abrasion of the skin. Then the salt causes a smarting, may set up inflammation, cause festering, and ultimately, perhaps, ulceration. This latter often results in a deep and painful wound, exceedingly difficult to heal. The second trouble takes the form of a skin disease, and has been termed the "bichromate disease."

The first symptom of that is an irritation of the skin at the back of, and between, the fingers; slight at first, but, if neglected, increasing

later with the appearance of minute watery pustules. The skin then becomes dry, and afterwards exfoliates in bran-like scales. In the more acute stages of the disease mattery pustules form, the skin dries up like hard leather, and cracks into painful sores, particularly on the joints when bent. The skin then peals off in thick scales not unlike the shell of a shrimp. At this stage the itching is almost unbearable. It is, however, consoling that the bichromate disease is quite a local one, as it does not extend beyond those parts that come into direct contact with the solutions—the hands, wrists, and forearms, and there only where the skin is thinnest. I have never known the palms of the hands to be affected. In some phases of the disease it closely resembles a form of psoriasis, and has, before now, been mistaken for it.

Remedial measures.—In the first form of trouble, bathing the part in warm water, to which is added a little ammonia, followed by bread and water poultices; if taken in time, this treatment will usually effect a cure. If, however, it does not, and there is an appearance of ulceration, a doctor should be consulted without delay. With regard to the cure of the cutaneous disease, none is known to the medical profession. There is, however, a simple and efficacious one, namely, to avoid further contact with the bichromate, and nature herself will quickly work a cure. This may be done by working, in future, in indiarubber gloves.

Palliatives.—If, at the first stage of the disease, the affected parts have a little of the strong nitrate of mercury thinly applied, though well rubbed into the skin, and future contact with the bichromate be avoided, as a rule, no further inconvenience will be experienced. In the more advanced stages of the disease the following lotion will be found to greatly allay the irritation:—Alcohol, 5 ounces; carbolic acid (crystallised), 40 grains; glycerine, ½ ounce. If the skin is much cracked, this lotion may cause considerable smarting, in which case it may be diluted with water, or a dilute solution of subacetate of lead may be used instead. When the hands are washed, a carbolic oil soap is preferable to all others, as it allays the irritation, and at the same time softens the hard skin.

Precautionary measures.—After sensitising tissue, always wash the hands, before exposing them to a strong light, in water to which a little liquor ammoniæ has been added, and afterwards in warm water. The ammonia will take the stain out of the skin and nails. If there happens to be an abrasion of the skin, a smarting will be felt; then, after the washing, the place should be well sucked for a few minutes, and, if further pain is felt, the part must be poulticed at bedtime. After finishing development wash the hands and arms, if they have been in contact with the developing water, in warm water, using a carbolic oil soap and a hard nail brush. When these simple precautions are taken, and the old proverb, "Prevention is better than cure," is kept in mind, there is little, if any, fear of ill effects from carbon printing even when it is practised continuously and on a large scale. I speak feelingly on this point, as the total neglect of them for a long period entailed very serious inconveniences on myself.

E. W. Foxlee.

PHOTOGRAPHY OF COLOUR.*

The first step in the tricolour process consists in making three negatives of the subject, which are exactly alike in form, but each different from the others in that its opacity represents different kinds of colour. They are similar in this respect (which is true of all negatives), that all are transparent in regions corresponding to black in the original, and all opaque in regions corresponding to white; but here the likeness ends: one must be further transparent in regions corresponding to red, another in those corresponding to yellow, and the third in those corresponding to blue. To accomplish this, various kinds of sensitisation and filtration are necessary. The fundamental conditions to be considered are these: First, black will always be represented in a negative by transparency, and white always by opacity; and, second, the superposition of red, yellow, and blue transparent pigments on white paper produces black, while the absence of all three will, of course, leave the paper white; therefore, whatever be the process of printing, this common or black, representing transparency of the three negatives, must have corresponding to it the three pigment impressions; and, further, the common or white, representing opacity, must have corresponding to it none of the three pigments.

The transparency, then, of each negative represents the extent and degree of distribution of a particular pigment. The red-printing negative is transparent for black and red, but opaque for yellow, blue, and white; the yellow-printing negative is transparent for black and yellow, but opaque for red, blue, and white; and the blue-printing negative is transparent for black and blue, but opaque for red, yellow, and white. And, since opacity results from the action of light, while transparency means the absence of such action, it follows that each negative is produced by the action of white light *minus* that particular colour which is to be printed by it. In other words, the colour of the light which produces each negative is complementary to the colour of the pigment printed by the plate made from it. An ordinary plate will not serve to make one of the negatives. Such a plate, however, is almost invariably used, and this means the underlaying of all the red pigment with the yellow. An attempt to correct this error is made by using a red ink, containing more or less blue, to neutralise the warm effect caused by the yellow, but much of the luminosity, and many of the delicate effects, especially in the tints, are lost by this compromise. The artist's severe criticism of the process with regard to this point is certainly most just. This arrangement makes it absolutely necessary that the yellow should be printed first, and the aim seems to be to bury it just as deep as possible. Such should not be the case, but rather, provided the pigments are equally pure and transparent, any order of superposition ought to give the same result. But there will be no such fault if the third plate is properly sensitised and exposed.

A very interesting fact in connexion with this subject seems to have been quite overlooked. In producing coloured pictures in pigments, or by light in the lantern, distinct, visible colours are substituted for various regions of the spectrum with reference to correspondence of colour, either when separate or when in combination; consequently, the ultra-violet light must be taken into account, so that its very marked chemical action may not result in the introduction of one or more of the colours in places and proportions wholly foreign to the original. This is of especial importance in making a coloured lantern picture, and must be provided against, by barring out the ultra-violet action.

The mechanical part of the process consists in preparing a plate from each of these three negatives, from which an impression in ink may be transferred to paper. Red, yellow, and blue ink is then applied to the respective plates, and the three impressions are successively superposed on white paper, care being taken to have them registered exactly.

Of the many perplexing problems which present themselves when it comes to the printing operation, we can say nothing here. To print from gelatine seems to be the easiest and most satisfactory method for experiment, although the difficulty in controlling the quantity of ink is a very serious one. If the right materials are used and the work is properly done, the printed picture thus produced will be a very exact reproduction of the original in colour. In actual practice there are a number of difficulties, as yet not entirely mastered, in consequence of which the majority of coloured pictures made in this way only approximate to the desired result. But this may, in all justice, be said of it, that the theory is sound, and that it is the only practical method so far discovered by which a permanent coloured picture can be produced by the aid of the camera. Photography is made, not only to select the proper colours, but to distribute them correctly as well. A simple illustration may serve to clear up some of the most difficult parts of the process. Let it be required to make a coloured picture of a bouquet of three flowers, one red, one yellow, and one blue, with a green leaf or two, all tied up with a white ribbon, and arranged with a black background; not a very artistic group, I must admit, but it best serves our purposes. The three negatives are taken and the printing plates prepared, each of which is rolled with its proper ink. The picture is to be made on white paper, and we understand that red, yellow, and blue pigments all three combined, produce black. What is each plate to do? It is evident that all three plates must spread ink over that part of the paper which is to represent the background, for that is black. Again, none of them must leave any ink on the space where the white ribbon belongs in the picture. The space for the red flower must receive red ink only, and so with the yellow and blue flower spaces, each of which must be printed with the one colour only, and, as for the green leaf space, that must receive both yellow and blue ink, and the resulting colour will be green; that is, each plate has certain portions of its surface blank, so that it does not obtrude its colour where it does not belong.

The production of a coloured picture with the lantern, by the use of three slides, is based on the same principles; but there are certain important differences in the negatives. That the differences are very considerable is not difficult to see; notwithstanding which, some eminent experimenters have come to the remarkable conclusion that a set of negatives which are correct for a coloured print are equally good for a lantern picture and *vice versâ*. This seems strange, for it may easily be shown that not a single negative in the print set is duplicated in the set from which the lantern slides are made. To make this set, an ordinary plate may be used for one negative, and it is exposed with a filter which cuts off the ultra-violet rays only. It corresponds very closely to the ordinary negative, but the ultra-violet action must be suppressed, else violet light will be substituted for what was invisible in the original, a very common fault with triple lantern pictures. The second negative is made from a correct orthochromatic plate, and a plate sensitised to red is used for the third.

The positive used in the red lantern is transparent, not only to the pure red, but also to the red in composition in the orange and yellow; the

* Concluded from page 346.

one in the green lantern transmits, besides the pure green, the component green in the orange, yellow, and blue; while the violet slide transmits pure violet and the violet ingredient of the blue.

There is one other point of interest in connexion with the so-called orthochromatic plate. The name signifies correct colour value. By that is meant a true representation of the luminosity, as measured by the eye, of the various parts and colours of the object photographed, when reproduced in the black-and-white monochrome. Photographic action is regulated far more by the kind of colour, the hue, than by luminosity. On the whole, the most luminous, and, generally speaking, the most effective colour ingredient in a coloured object or group is the yellow, the blue, as a rule, being inferior. If, then, any one colour class to be represented by light is to be luminous in the monochrome, it should be the yellow, and not the blue, as is the case in all ordinary photographs. Sensitisation to yellow and proper infiltration accomplish this result. It is always necessary to use a filter, however, in order to prevent the action of the blue-violet, which, together with the yellow, would destroy the balance in the monochrome, too much being represented as light. If the colours be grouped, as before, into the blacks, reds, yellows, blues, and whites, and two of these groups, one of which is the white, be represented as light, and the other three, which include the black, be represented as dark, the resulting monochrome seems to be well balanced.

An ordinary plate produces two groups, the whites and blues, as light regions; a good orthochromatic plate without a filter reproduces three groups, the whites, blues, and yellows, as light regions, while the same, with an orange filter, reproduces the white and yellow as light, and the blues, reds, and blacks as dark parts, thus preserving the balance and giving a true orthochromatic result in the monochrome.

In conclusion, it may be fairly claimed that the subject of photography of colour furnishes a most interesting and profitable field for investigation and study. It is of much worth to the scientist in dealing with the many subtle phases of the nature of light. Of no less importance is it to the artist, who frankly acknowledges the aid derived from the analysis and synthesis of light by this means, and its bearing on the nature of pigment colour. But the greatest value probably lies in the promise of its becoming a means of true education of the æsthetic sense with reference to that much-neglected, not to say greatly abused, aspect, the colour quality.

PROFESSOR J. STEWART GIBSON.

THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE Forty-first Annual Exhibition of the Society will be held from September 28 to November 12, 1896, in the Gallery of the Royal Society of Painters in Water Colours, 5A, Pall Mall East, London, S.W.

ADMISSION.

The Exhibition will be inaugurated on Saturday, September 26, by a Private View, followed in the evening by a *Conversazione*.

The Exhibition will remain open daily (Sundays excepted) from Monday, September 28, until Thursday, November 12. Admission (from ten a.m. till five p.m.), 1s. It will also be open on Monday, Wednesday, and Saturday evenings, when lantern slides may be shown; admission (from seven to ten p.m.), 6*d*.

Members have free admission at any time. They receive ten tickets for their friends, available either in the day or the evening, and can purchase additional tickets at half price. Members of affiliated societies can purchase tickets at half-price of their respective Secretaries. Every exhibitor receives a season ticket and a catalogue of the Exhibition.

MEDALS.

Medals will be placed at the disposal of the Judges. Exhibitors may state whether they wish their exhibits to go before the Judges in the Art or the Technical Section, or both. The Exhibition will be conducted according to the rules adopted at the Conference of Judges.

The under-mentioned gentlemen have been elected by the Members of the Society to act as Judges, and have consented to serve:—

Art Section.—Mr. F. P. Cembrano, jun., Colonel J. Gale, Messrs. B. W. Leader, A.R.A., G. A. Storey, A.R.A., and W. L. Wyllie, A.R.A.

Technical Section.—Captain W. de W. Abney, C.B., D.C.L., F.R.S., Messrs. Chapman Jones, F.I.C., F.C.S., and Andrew Pringle, F.R.M.S.

GENERAL REGULATIONS.

Photographs.—Each exhibitor must fill up the entry form supplied by the Society, and send it to the Secretary, Royal Photographic Society, 12, Hanover-square, London, W. Information as to particulars should be given with any work produced by a special process of the exhibitor.

At the back of each frame must be written the name and address of the exhibitor, with the title or description of the photograph, and the number (if there are more than one) to which it refers in the entry form. The front of the frame or picture may have the exhibitor's name, and the title of the picture, neatly inscribed upon it, *and this only*. To avoid damage to other frames, it is requested that all frames have sunken backboard, with the fastening nails not projecting, and the backs covered with thick brown paper.

Lantern slides will not be eligible for award unless both the negatives and slides are the work of the exhibitor. Frames will be provided for them.

Negatives, transparencies, photo-mechanical prints, stereoscopic work, photographs of purely scientific interest, and photographs coloured by scientific or mechanical means will be admitted. Photographs in Oxford frames, photographs already shown in any public Exhibition within the London postal district, and photographs coloured by hand are not eligible for admission. Excessive breadth in frames or mounts, silvered or oval frames, or projecting mouldings, are undesirable, and may prevent photographs from obtaining the position they otherwise merit. It is generally desirable that each photograph be separately framed.

All working up of photographs by hand, except mere spotting, is undesirable, and may cause the rejection of the exhibit.

Apparatus.—Each exhibitor must fill up the entry form supplied by the Society. A removable card must be attached to the exhibit containing the name of the exhibitor and the number to which it refers in the entry form. Attention is requested to this regulation, as, without it, the description of the apparatus may not appear in the catalogue. The exhibitor should fasten on each exhibit a small adhesive label containing his name only.

No apparatus will be admitted that has been shown in the Society's previous Exhibitions unless it has some new detail. All apparatus must be *concisely* described, and a list of the novel details given. Apparatus that has already been shown at London Exhibitions may be refused.

Sales.—The prices of the exhibits will be published in the catalogue so far as they are furnished by the exhibitors. Exhibits not priced on the entry form will be indicated as being "not for sale." Fifteen per cent. commission will be deducted on sales.

Foreign Exhibitors are invited to contribute. They will not be charged for wall space. The Society will provide frames or portfolios during the Exhibition for approved photographs.

Reception of Exhibits.—Exhibits sent by carrier must be *carriage paid*, and addressed to the Secretary, Royal Photographic Society, 12, Hanover-square, London, W., and must arrive on or before Wednesday, September 9.

Exhibits sent by hand will be received at 12, Hanover-square, W., only from nine a.m. to nine p.m. on Thursday, September 10, after which time and date no exhibit can, under any circumstances, be received for competition.

Very large frames and bulky or fragile apparatus may be delivered at the Gallery, 5A, Pall Mall East, if special arrangement, beforehand, is made with the Assistant Secretary.

Removal of Exhibits.—Exhibits received in packing cases will be repacked and dispatched as soon as possible after the close of the Exhibition.

Exhibits delivered by hand must be fetched away on the day appointed, due notice of which will be sent to the exhibitors.

Particular attention is requested to the removal of exhibits on the day appointed. If not taken away then, considerable expense will be incurred in removing and warehousing. This expense will be charged to the exhibitor. Exhibitors can have their pictures packed in a case and sent by carrier, by giving instructions to the Assistant Secretary and paying the cost.

CHARGES.

The privileges mentioned below are accorded to members of the Society whose subscriptions are not in arrear, and are granted to them in their individual capacity only. A firm or company exhibiting in their corporate capacity is treated as a non-member, although one or more members of the firm may be members of the Society.

Wall Space.—No charge will be made to members of the Society. To non-members a charge of 1*s*. per square foot, and to members of affiliated societies a charge of 6*d*. per square foot, will be made for wall space. To obtain this reduction, the entry form must be accompanied by the membership voucher bearing the affiliation stamp. The minimum charge in each case is 5*s*. Lantern slides and transparencies will be charged as for pictures. Twelve lantern slides are calculated as equal to one square foot. Postal orders to pay for the wall space required must accompany the entry form, and, should any of the photographs not be accepted, the due proportion, in excess of the minimum charge, will be returned. The charge for wall space to those exhibitors who may be elected as members of the Society before the end of the year will be remitted, and the amount paid credited to their entrance fee and subscription.

Apparatus.—The apparatus will be under the personal supervision of an attendant, who will be ready to furnish explanations to visitors during the whole time the Exhibition is open. Each apparatus exhibit will be described in the catalogue, and, where thought desirable, illustrated. The charge to members will be at the rate of 5*s*. for each piece of apparatus or square foot of table or floor space (whichever is greater), with a minimum charge of 10*s*. The rate to non-members will be at 10*s*., with a minimum charge of 20*s*. These charges must be enclosed with the entry form, or the exhibit will not be received. If a case of apparatus is accepted for exhibition, each item contained in it will be treated as a

separate exhibit and so catalogued and charged for, except when the items naturally form a single exhibit; as, for example, a hand camera, including the camera and lens, or an apparatus with parts of it shown separately to illustrate its construction.

CONDITIONS.

It is to be distinctly understood that the sending of exhibits signifies acceptance by the exhibitor of the decision of the Council upon all matters connected with the Exhibition as absolute and final.

The Council do not hold themselves responsible for any damage that may happen to the exhibits while in their custody, but every precaution will be taken to ensure their safety and prompt return to the owners at the close of the Exhibition. They reserve the right to reproduce in the catalogue any of the pictures exhibited.

OPTICAL LANTERN.

Photographic lantern slides will be shown by means of the Society's optical lantern during the Exhibition. The loan of slides for this purpose is invited. They must not exceed three and a quarter inches in height, and, to facilitate selection and arrangement, they must be delivered at the Gallery not less than three days before the evening of their being shown in the lantern. If sent by carrier, they should be addressed to the Secretary, Royal Photographic Society, 5A, Pall Mall East, S.W., and they will be returned within seven days of their exhibition.

Blank entry forms and any further information respecting the Exhibition, also nomination forms for membership, can be obtained from the Assistant Secretary of the Society, 12, Hanover-square, London, W.

THE W. H. HARRISON FUND APPEAL.

	£	s.	d.
Donations previously acknowledged	60	11	0
H. M. A.		5	0
Mrs. Fleming Baxter, M.R.I.	2	2	0
Wm. Crookes, Esq., F.R.S.	2	2	0
Per the Editor, THE BRITISH JOURNAL OF PHOTOGRAPHY—M. Carey Lea, Esq.	2	2	0
	£67	2	0

Further donations will be thankfully acknowledged by

FREDK. H. VARLEY, 82, *Newington Green-road, London, N.*

Our Editorial Table.

MODERN OPTICAL INSTRUMENTS.

By HENRY ORFORD. London: Whittaker & Co., 2, White Hart-street, Paternoster-square.

MR. ORFORD is already favourably known by his volume on *Lens Work for Amateurs* which established his capacity for dealing in a practical manner with the optics of photographic lenses. The present book is mainly concerned with the study of optics as applied to the human eye, the aberrations of which, as well as its properties as an optical instrument, form an introduction to a series of chapters on the employment of the ophthalmoscope; retinoscopy; and spectacles and their selection. It will thus be seen that the little work, which is clearly and concisely written, is calculated to prove serviceable to those making a study of the aberrations of the eye and the remedial treatment therefor demanded. Chapters on the optical lantern, the stereoscope and the spectroscope conclude the volume, which is freely illustrated, and is got up in the praiseworthy manner one is accustomed to look for in Messrs. Whittaker's publications.

WALNOTINE.

Walnot & Co., 917, Garscube-road, Glasgow.

"WALNOTINE" is the name of a two-solution developer, sample bottles of which Messrs. Walnot & Co. have sent us for experimental use. It answers admirably, yielding with correctly exposed plates bright and well-gradationed negatives. It admits of repeated use, retains its colourlessness for a considerable time, and should be appreciated by amateurs and occasional workers.

CATALOGUE RECEIVED.

Andrew H. Baird, 37, Lothian-street, Edinburgh.

MR. BAIRD has deservedly won a prominent place among Northern photographic dealers, and this neatly turned-out catalogue testifies to the acumen with which he selects his stock. Particular mention is made of the Lothian cyclist camera; the Todd-Forret magnesium lamp (excellent examples of exposures made therewith being given); and many other of Mr. Baird's specialities, which sandwich, as it were, a well-selected assortment of general apparatus and sundries.

EDWARDS' PLATES AND FILMS.

B. J. Edwards & Co., The Grove, Hackney.

MESSRS. EDWARDS were early in the field with the manufacture of gelatine dry plates, and it says much for the good qualities of these plates and the reputation of the firm that, after the lapse of so many years, they should enjoy such a large measure of public esteem. During the last few weeks they have given us the opportunity of trying some of their plates and films of most recent manufacture. As is well known, Messrs. Edwards issue two series—isochromatic and ordinary—each in three rapidities, medium, instantaneous, and snap-shot. It is late in the day to advert to the colour-correct rendering qualities of the isochromatic plates, which were long ago recognised as putting a great power in the hands of the photographer having objects in colours to take. The slower kinds of plates appear to be very thickly coated, and thus become of great service for long exposures and interior work. The "snap-shot," ordinary and isochromatic, are exquisitely sensitive, and the grain bears the scrutiny of magnification extremely well. Both plates and films possess great mechanical evenness, are easy to develop, and, as regards the "snap-shot" (probably as quick an emulsion as there is) well withstand development veil, that bugbear with very rapid plates. Altogether, Edward's plates highly deserve the popularity they enjoy.

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, June 9, at eight p.m., at 12, Hanover-square. *Cellulose and its Derivatives*, by Messrs. Cross and Bevan. *On Printing Densities*, by Captain W. de W. Abney, C.B., F.R.S.

SOUTHPORT SOCIAL PHOTOGRAPHIC CLUB.—The Sixth Annual Exhibition of members' work will be held from October 26 to 31 inclusive. Five awards (a volume of the *Magazine of Art*, two value 10*s.* 6*d.*, and two value 5*s.*) will be placed at the disposal of the Judges, to be given, if the work merits it, for the artistic and technical excellence of photographs and transparencies.

KIMBERLEY CAMERA CLUB.—Honorary officers, 1896-97. *President:* Mr. James Lawrence, M.L.A.—*Chairman:* Mr. Montague Thane.—*Vice-Chairman:* Mr. Charles Howie.—*Council:* Messrs. J. Childs, J. Bennett, E. Goffe, S. Turner, and P. H. A. Pope.—*Lanternists:* Messrs. J. Childs, E. Goffe, and J. W. Lawrence.—*Secretary and Treasurer:* Mr. Frank H. Hancox, P. O. Box 305, Kimberley.

WE regret to record the death of Mr. James Charles Heaviside, who died on the 25th ulto., in his seventy-second year. It is the older readers of THE BRITISH JOURNAL OF PHOTOGRAPHY who will remember Mr. Heaviside. He was for twenty-five years the trustworthy manager for, and confidential friend of, the late J. H. Dallmeyer and of his son and successor. Mr. Heaviside was a man of considerable artistic and literary ability, and no mean musician. His imposing personality and charm of manner eminently fitted him for the commercial duties in which he was engaged, and gained for him a wide circle of friends. He retired from active business life in 1884, and had suffered for some years from indifferant health. The immediate cause of death was bronchitis. In addition to the personal friends and relatives who attended the funeral, some of the oldest hands from the firm of Dallmeyer attended as a last mark of affection and respect.

THE X RAYS.—The General Electrical Association of Berlin announce that they have succeeded in so improving the Röntgen tube as to render it possible for the internal structure of the head, the larynx, and more especially the action of the respiratory organs and heart, to be observed direct on the fluorescent screen. A practical demonstration will be given at the Surgical Congress. Mr. Edison gave a semi-public exhibition of his new light at New York last week. It was variously described as "luminous ether light" and "X ray light." The lamp used was an ordinary Crookes' tube, about five inches long, coated inside with some kind of crystals easily obtainable, the exact nature of which the inventor refused to disclose. To an interviewer Mr. Edison said: "The X rays undergo some organic change in passing through the crystals, and practically no heat is generated. Thus, all the energy which in an incandescent lamp is lost in heat is turned into light," resulting in an economy, it is understood, of seventy-five per cent., one of the new lamps of only four-candle power giving a light equal to that obtained by the usual sixteen-candle power incandescent lamp. The commercial value of the discovery remains to be demonstrated.

Patent News.

THE following applications for Patents were made between May 20 and 27, 1896:—

KINETOSCOPE.—No. 10,773. "Improvements in Apparatus for Taking and Exhibiting Successive Photographic Pictures." A. N. PETIT.

TRIMMING PRINTS.—No. 10,872. "The 'Practical' Trimming Glass for Trimming all kinds of Photographic and the like Prints, Drawings, and Illustrations." T. R. WATSON.

PHOTOCHROMY.—No. 10,994. "A Process of Reproducing Photographs of Oil Paintings." S. RAPPA and J. BERRY.

FINDER.—No. 11,001. "A Finder or Camera Obscura for Photographic or other purposes." J. AIRS.

CAMERA.—No. 11,015. "Improvements in Photographic Cameras." H. W. G. PLUNKETT.

ARTIFICIAL LIGHT PHOTOGRAPHY.—No. 11,262. "Improvements in connexion with Artificial-light Photography." C. E. ELLIOTT.

DEVELOPING SOLUTIONS.—No. 11,306. "Improvements in Photographic Developing Solutions." Complete specification. J. HAUFF.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
8.....	North Middlesex	Demonstration on Rough Bromide Paper. S. H. Fry.
9.....	Birmingham Photo. Society ..	Exhibition of Competition Pictures taken upon the Excursions to Marston Green and Kenilworth during April.
9.....	Hackney	Discussion on previous Lectures.
9.....	Royal Photographic Society ...	*Cellulose and its Derivatives.* Messrs. Cross and Bevan.—*On Printing Densities.* Captain W. de W. Abney, C.B., F.R.S.
11.....	London and Provincial	*Who Uses Quick Plates for Hand-camera Work?* W. D. Welford.
11.....	Borough Polytechnic	Excursion: South Norwood and Shirley.
13.....	Leytonstone	Excursion: Loughton and High Beech. Leader, C. A. Russell.
13.....	Oldham	Excursion: Bramhall Hall. Leader, C. A. Hempstock.

ROYAL PHOTOGRAPHIC SOCIETY.

MAY 26.—Technical Meeting.—Mr. E. Cecil Hertslet in the chair.

Mr. LAMBERT MATTHEWS, of the Scientific Hand Camera Company, exhibited and described the "Scientific" hand camera for 5×4 plates, constructed on the twin-lens principle, and adapted for use with dark slides, roll-holder, or with a changing box, and fitted with a rapid rectilinear lens by Beck and a Thornton-Pickard shutter.

The subject for consideration was

APPARATUS FOR PHOTOGRAPHING ON SMALL PLATES

(less than quarter-plate), and several instruments were exhibited.

Mr. E. Clifton showed an early form of binocular camera, which was given to him by the late Mr. William Spicer, of Clerkenwell, and which was probably one of Geymet's cameras.

Mr. T. BOLAS said that in Geymet's cameras the changing mechanism contained a disc, in which an aperture was cut, and this was revolved to bring a different part of the plate into position for exposure.

The ASSISTANT SECRETARY (Mr. Child Bayley) had an opportunity of examining one of Geymet's instruments, which was in the possession of the late Mr. Traill Taylor, and the camera shown by Mr. Clifton appeared to be identical with it.

Mr. Clifton also showed one of Mayfield's ebonite hand cameras belonging to Mr. Noel Cox, in which several modifications had been made, including the addition of a specially constructed shutter by Newman & Guardia, working from $\frac{1}{2}$ to $\frac{1}{100}$ second, and changing boxes to hold twelve plates or twenty-four films.

The HON. SECRETARY (Mr. Chapman Jones) showed a small camera from the Society's museum which bore the name "Bryceson, Edinburgh," and was provided with a Dallmeyer medallion lens, which had been identified as having been made in February 1870, working at *f*-2. The camera appeared to be identical with the form used by the late Professor Piazzi Smyth. It was adapted for the silver-bath process, and comprised a square, water-tight receptacle, each face of which carried a plate, and which revolved in order to bring the plates successively into position. The lens was mounted in a spring jacket, and could be adjusted at four different points, presumably for focussing at varying distances. The exposed portion of the plate was an inch square, but the bath would accommodate one three inches in length, which was exactly the size of the ordinary micro slip used by Professor Smyth. Mr. Chapman Jones said he had always advocated the use of the half-quarter plate for hand cameras, which possessed many advantages, and he showed a cutting board which he had designed for facilitating the division of quarter-plates into two equal portions.

Messrs. Newman & Guardia exhibited a hand camera, constructed to carry twelve plates or twenty-four films of half-quarter-plate size, and fitted with a Zeiss lens of 3¾-inch focus, and working at *f*-6·3.

The HON. SECRETARY thought nearly all hand cameras were made the wrong shape; in all changing arrangements there must be a little space on one side of the plate, and most makers put that extra space on the narrow side, thus producing a "lumpy" parcel, instead of a flat one.

Mr. G. W. TOTTEM, of the Eastman Company, showed the Pocket Kodak, and specimen negatives, prints, and enlargements. As an instance of the popularity of this instrument, he mentioned the fact that during last week 1300 cameras and 26,000 film cartridges had been sold.

Mr. LEON WARNERKE spoke highly of the performance of the camera during his tour on the Continent in February and March last, and said he had been able to obtain fresh supplies of film in small towns in various parts of France, Germany, Italy, and Switzerland.

Mr. J. W. Barlow, representing Messrs. Beck, exhibited a No. 1 Frena; and Mr. Middlemiss sent a camera for enlarging from small negatives.

THAT DEVIL AGAIN.

Mr. LEON WARNERKE said that at a recent meeting some members had said they did not know what "devils" were, and he had therefore brought for inspection a plate and print in which "the devil himself" was plainly visible. Asked for an explanation to account for his majesty's appearance, he said he could offer no theory, and wiser men than he had been unable to fathom the mystery.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 23.—Mr. R. Beckett in the chair.

Mr. Edward Simpson was nominated for membership.

The HON. SECRETARY reported that he had written to the County Council and the Hampstead and St. Pancras Vestries as resolved in the matter of the operations on Hampstead Heath, and had received a letter from the last-named stating that their Committee, having gone into the matter, recommend that no action be taken. The Hon. Secretary referred to some experiments conducted by himself and Mr. Wiss as to whether the use of ruby glass as a support for the emulsion instead of ordinary glass would tend to avoid halation, and said that the films had now been stripped for examination, as, owing to the density of the ruby glass, this was not possible before. He thought that the negative on the ruby glass showed a certain amount, though less, of halation, and drew attention to the fact that the ordinary plate in the high lights was very much thinner than the ruby, although they both received identical exposures and development, and were of the same batch of emulsion.

A discussion took place on the subject of the accelerating action of air on a plate during development, and,

Mr. WELFORD detailed a case in his own experience where a plate, after long immersion in the developer, showed no sign of an image, but, on subjecting the same to the action of the air for five minutes, the silver was found to be reduced almost through to the back. His opinion was that the more the plate was taken out of the solution and exposed to the air, the quicker would the action be.

Mr. HENDERSON referred to the practice of washing the plate in water two or three times during development, so as to get a softer negative, and thought you might just as well dilute the developer at the beginning instead.

ON THE WASHING OF PRINTS WITHOUT RUNNING WATER.

Messrs. HADDON and GRUNDY, in a paper on the above subject, after referring to the result of their investigations on the washing of albumen prints in running water, which showed that the usual two hours' washing was unnecessary, as all the silver and hypo capable of elimination by water could be washed away in twenty minutes, said they had been since endeavouring to decide the number of changes of water necessary for the perfect washing of a print when running water was not available. Albumenised paper was sensitised on a neutral nitrate of silver bath, dried, and cut into pieces of equal size. These pieces were then washed in several changes of water until all milkiness had gone, when they were immersed in a litre of twenty per cent. of hypo for twenty minutes, with constant movement, after which they were removed to the washing water. The authors decided that the amount of washing water should bear a fixed ratio to the area of the paper, that decided on being one cubic centimetre of water to every square centimetre of paper surface, which, with the quantity of paper to be treated, gave a quantity of 2445 cubic centimetres of water. At the end of five minutes' immersion, with constant movement in this water, two pieces, equal to a quarter sheet, were withdrawn for the estimation of the quantity of silver therein contained, and dried, the remainder being placed in another vessel containing 2201 cubic centimetres of water, the difference being allowed for the lesser quantity of paper, so as to keep the same ratio of paper area to washing water. The same process was observed through ten changes of water, a quarter sheet being withdrawn at each change for estimation. At the same time tests were made of the value of the various methods for ascertaining whether a print has been properly washed by examining the wash water, a quantity from each change being set apart for this purpose. The tests adopted were the permanganate of potash, iodide of starch, and sulphuretted hydrogen methods, the first two for the presence of hypo, and the latter for detecting the silver. Several test tubes were taken, two being filled with ordinary tap water, and to one of them one drop of permanganate of potash solution was added, which coloured the water a faint pink. The other test tube was likewise treated, iodide of starch replacing the permanganate. The tints of these were fixed on as standards, and to test the wash water some was placed in a test tube, and the number of drops of permanganate and iodide necessary to bring it to the same tint as the standard tubes showed roughly the quantity of hypo in the water, and the progress of the washing. The sulphuretted hydrogen was added to the wash water in a test tube, and, after standing some time, on looking down the tube, the presence of silver was indicated by a brown tint. The amount of silver still present in the paper after each washing was estimated by allowing them to dry, and burning to ashes in a dish. This ash was boiled in distilled water with several changes, and then with dilute nitric acid to dissolve the metal, filtered, and the residual ash treated with strong ammonia to dissolve any silver chloride possibly formed by impurities in the nitric acid. This was neutralised by nitric acid, and added to the former solution, which were then together heated to boiling point, and a few drops of hydrochloric acid added to precipitate the silver. The chloride thus formed was allowed to settle, filtered, and washed, and then estimated in the usual way. It was found that, after the third change, the amount of silver remained constant, and no effect was produced with further washing. It was likewise found that the third change was the last in which any hypo could be traced.

When it is remembered that the function of the water is not to dissolve the silver salts, but to replace the sodium hyposulphites, which already contain the silver in solution, it is easier to understand that three changes were sufficient to extract the soluble silver salts from the paper, although at first it may seem extraordinary. The authors state that their experimenta show that five changes are sufficient to completely elimiuate the hypo and all soluble silver, but they drew attention to the fact that, throughout, the paper was continually on the move.

The CHAIRMAN thought it evident that Messrs. Haddon and Grundy had given a great deal of attention to these experiments. Mr. Henderson had found that long washing was injurious. Whenever he found prints fading, it was generally traceable to this cause, and with this he agreed. It was not only utterly useless, but extremely harmful, and lime might be deposited in the paper. With gelatine papers the effect would be worse.

Mr. HENDERSON repeated that the prints had been kept in constant motion, and that this greatly affected the result. He detailed a method of washing prints, introduced by Ross & Pringle, of Edinburgh, where the prints were suspended from cross pieces in tanks, and the water automatically syphoned off, leaving the prints to drain, the tank subsequently refilling. With reference to long washing, it used to annoy him to have prints returned faded, but he found it to be due to the bronze in the mounts. He was of opinion that fixing baths of too great strength were used, and that by so doing a fading action was set up, and an element of failure introduced. He had purposely tested the merits of strong and weak fixing solutions under the same conditions, and was convinced of the error of using strong solutions.

Mr. GRUNDY said in washing prints most people looked at it as if they were dissolving something out instead of simply replacing. With albumen paper, it is impossible to fix out with hypo the remaining silver, but, in the case of two brands of gelatine paper he had tried, you can get rid of all traces of it.

Mr. HENDERSON queried whether some of the gelatine papers did not contain albumen.

PHOTOGRAPHIC CLUB.

MAY 27,—Mr. A. Mackie in the chair.

After some formal business, the CHAIRMAN asked the members to welcome the Rev. F. C. Lambert as a visitor.

Mr. Welford passed round some strips of pocket Kodak negatives from exposures which he had lately made in Holland.

Mr. Snowden Ward passed round some samples of colour printing, which were called Synchromie. These were made by Count Turati's process, and the point of novelty consisted in the fact that the seventeen colours of which the print was composed were printed at one impression. The advantage appeared to be a great saving of time in the printing operation, general economy, and the certainty of accurate register.

Mr. FOXLEE queried whether commercially the three-colour printing process was in successful operation, and whether the best colour work by typographic methods was not obtained with a larger number of printings.

Mr. WARD said that undoubtedly the three-colour process in this country was generally used for the cheaper class of work, whereas in America they had laid themselves out to do the highest class of work with it, regardless of commercial considerations. He thought that the more expensive colour printing was usually done by processes involving a larger number of separate printings.

Mr. F. HAES then gave his demonstration of

THE DAGUERREOTYPE PROCESS.

He first of all gave a short account of the early workers, and said that, although Daguerre had given his name to the process, it was extremely probable that Niépce really deserves the credit for the discovery. Daguerre had first used iodine only for sensitising his silver plates, and the resulting films were terribly slow, a portrait in full sunshine, and with a large aperture, requiring sometimes more than half an hour's exposure. In 1839 Goddard found that the vapour of bromine, in conjunction with iodine, largely increased the speed of the plate, and this combination afterwards obtained. The Daguerreotype process was essentially one depending upon the man as well as the material, and in this is quite the opposite to our present "press-the-button" methods. Everything had to be of the utmost purity, and the greatest care, cleanliness, and regularity of method, manners, material, and temperature had to be observed. Mr. Haes then proceeded to demonstrate the working of the process. He polished his silver plates with tripoli, and buckskin or cotton velvet buffs, which he had made himself for the occasion. Having prepared the plate and described the use of the sensitising box, which contained an arrangement of reflectors and mirrors, by which the progress of the sensitising could be watched, the lecturer proceeded to prepare a plate and to point out the changes in colour as they took place. He also pointed out that, when perfectly sensitised, by a skilled use of the combination of the vapours of bromine and iodine in separate vessels an extremely sensitive film resulted, almost as sensitive, in fact, as a modern dry plate. On the other hand, the fineness and sharpness of the lines of the pictures, and their extreme delicacy were unapproachable by modern methods. After sensitising, the plate was developed over the vapour of heated mercury, and the principle of development was clearly indicated by the fact that, whilst the change in the iodide film took place in a marked degree where the light had acted upon it, on the other hand, there was no deposit of mercury, or any alteration in character, of the polished silver film of the copper plate where it had not been attacked by the bromine or iodine vapour. Mr. Haes described the completion of the picture by the Fisot fixing method.

A very interesting evening was suitably concluded by an exhibition of old Daguerreotypes from the museum of the Club, the lecturer being well plied with interesting questions of a technical character. In the course of these questions it was stated that the Daguerreotype process was in use in America for observatory work so recently as within the last ten years, and that bromide of potassium was listed at 4*s.* per ounce, and hyposulphite of soda at 6*s.* per pound, in the days when Daguerreotype was the photographic method.

Mr. FRY proposed a vote of thanks to Mr. Haes for all the trouble he had taken in working up the methods and almost-forgotten details of the oldest and most interesting process. Mr. Haes had been exceedingly kind to the Club in this matter. First he had presented a complete set of apparatus peculiar to the process. In the second place, by taking a great deal of trouble and incurring some further expense, he had given the members a capital insight into the actual technicalities of the process itself. This was most interesting to the younger and older members alike, and Mr. Haes had added still more to the debt of gratitude which the members individually, and the club generally, owed him.

The CHAIRMAN said that no formal seconding of a proposition, which was so obviously acceptable to all present, would be put by him to the meeting, which thereupon signified its complete accord by hearty applause.

Mr. HAES expressed his thanks and the pleasure it had afforded him to give the demonstration.

Brixton and Clapham Camera Club.—May 19, Mr. W. Thomas (Vice-President) in the chair.—Under the arrangement for the interchange of demonstrations between affiliated societies, a paper on

ENLARGED PAPER NEGATIVES

was read by Mr. H. STUART, of the North Middlesex Photographic Society. The following is a brief summary:—Paper, as a support for the negative photographic image, was used before glass, and is therefore no novelty, but the process gradually fell into disuse, and has become almost extinct. Considering, however, the improvement in the manufacture of papers and emulsions during the last two or three years, I am led to believe the method worth resurrection. My experiments have been confined to the production of enlarged negatives on paper from small positive prints, and I think the process has its recommendations. The way I set to work is to take a contact print on smooth bromide or gelatino-chloride paper, and squeegee the same on a piece of glass, say, a well-cleaned spoilt negative. Gelatino-chloride paper is perhaps the best, and the print need not be toned, but simply fixed and washed, and, owing to the non-actinic colour of the untoned image, a weak print will be found to copy well. By mounting behind glass, as mentioned, the grain of the paper will give no trouble, at any rate for enlargements, such as from quarter-plate to 12×10. The print is then enlarged to the required size by reflected light, the usual form of daylight enlarging apparatus being well adapted for the purpose. In consequence of the faintness of the image, the ground-glass screen is unsuitable for focussing, which must be done with an eyepiece on the aerial image itself. It is also well to mark once for all on the baseboard of the camera the correct distance from the lens for, say, 10×8, 12×10, and 15×12 in enlargements, thus saving adjustment on future occasions. Slow bromide paper is the substance on which the enlarged negative is taken, and it must be placed behind a piece of glass in the dark slide so as to be kept flat. Exposure is prolonged and varies of course with the degree of enlargement, strength of light, &c. Enlarging, for instance, from quarter-plate to 12×10 with *f*-16 may take from a quarter of an hour in summer to three hours in winter, but by using an actinometer, as in carbon printing, the question of exposure is reduced to a simple one, and no difficulty need occur. After exposure, the bromide paper is developed (preferably with hydroquinone), and an enlarged negative is the result. This may be waxed over to render more transparent and to fill in the grain of the paper, or may be used as it is if the grain is not objected to. Waxing is a tricky matter and requires practice. Coating with a brush dipped in melted paraffin wax is one way; others are, soaking the negative in a hot solution of the same, or brushing over a solution of wax dissolved in some solvent (as benzine) which quickly evaporates, leaving the paper translucent. The negative being now finished, a positive may be printed from it in gelatino-chloride, platinotype, carbon, or other desired process. In conclusion, the following points may be claimed in favour of the system: *Economy.*—Bromide paper is less than half the cost of glass plates or celluloid films; is not liable to breakage, a not uncommon mishap in printing from large glass negatives; is lighter than glass and stores in less space. *Ease in Retouching.*—The paper negative can be spotted or retouched with far greater ease than a glass negative or transparency. *In Carbon Printing,* by single transfer, a reversed negative is unnecessary, the loss of sharpness caused by printing through the paper being very slight. To add force to his description, Mr. Stuart showed two or three dozen enlarged negatives, together with the originals from which they were taken, and also enlarged prints in bromide, gelatino paper, and carbon. Mr. Stuart said some of these were examples of what to avoid, being mistakes which might be expected in the experimental working of a process about which little information could be obtained from the ordinary photographic sources. Be this as it may, many of the results shown were really exquisite, and several present decided to give the process a trial.

Croydon Camera Club.—May 30.—A party of thirty members of the Club, in charge of the President (Mr. Hector Maclean, F.G.S.), visited, by special permission of the Mayor of Croydon, the new municipal buildings lately opened by H.R.H. the Prince of Wales. Cameras were busily employed from 2.30 to about 7.30. Besides the various law courts, the council chamber, and public library, members found that the grand staircase, the Mayor's parlour, the steam heating apparatus, the clock machinery, and bird's-eye views of Croydon from the campanile gave them promising subject-matter. By kindness of the Mayor tea was provided, at 5.45, in one of the committee-rooms, in the course of which the President proposed the Club's hearty thanks to Mr. F. T. Edridge (the Mayor), for having afforded all so acceptable an opportunity of picturing the magnificent Town Hall. Seconded by the Vice-Chairman (Mr. J. Nooks), the above was carried with much fervour.

PAYMENT FOR REPRODUCTIONS.

In the course of his speech to members, Mr. Maclean drew attention to the fact that the proprietor of a local journal specially invited *amateurs* to submit photographs for publication of the Royal visit, &c. He explained to those assembled that the trade custom was to not accept less than 10*s.* 6*d.* per print, and urged upon members of the Club not to undersell each other, or spoil the market, by offering prints for less than the standard minimum. These re-

marks, pointed by personal experiences, were not only well received, but seemed to have made an enduring impression upon the large gathering. Before dispersing, Messrs. Underhill and Bown took negatives of the party grouped upon the Town Hall steps.

North Middlesex Photographic Society.—June 1.—Mr. PITHER opened a discussion on

ARCHITECTURAL PHOTOGRAPHY.

He brought down numerous engravings to illustrate his remarks of various styles of architecture, and suggested that the Society should make a study of old buildings, churches, &c., and photograph special parts of interest, not only taking general views of the subject, and suggested that a special outing should be held with this object in view, to see how the idea worked. A lengthy discussion took place, in which a number of members joined, and at the end of the meeting the opinion of those present was taken as to the advisability of this step. Mr. CHILD BAYLEY proposed and Mr. COX seconded that "it is desirable that an outing on the lines suggested by Mr. Pither should be held." A number of members promised to assist if called upon

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

BROMIDE PAPER FOR NEGATIVES.

To the EDITORS.

GENTLEMEN,—Replying to "W. R. F." in your issue of May 22, I would advise him to apply to the Eastman Photographic Materials Company, Limited.

I have a roll-holder in which I wished to use bromide paper, and I applied to the above firm, asking them if they would supply me with bromide paper in rolls of the size I required. They immediately consented to do so at the usual price of bromide paper. I gave the order for one dozen rolls (twenty-four exposures each, half-plate) on a Monday, and the rolls were delivered on Thursday. It is "An Extra-Rapid" quality that I have, and I have been delighted with the results I have obtained. Of course it is slow, in comparison with dry plates; about equal, in fact, to a "process" plate; but personally I prefer a slow plate.

I rarely use wax or oil on this paper, and it is perfectly suited for carbon printing (single transfer) by printing *through* the negative.—I am, yours, &c.,

ALFRED PARR.

Redditch, May 27, 1896.

MR. R. CHILD BAYLEY ON ART MATTERS.

To the EDITORS.

GENTLEMEN,—Is there a subtle conspiracy to worry photographic art and artists all along the line at a time of year when every true pictorial photographer, who would do his utmost for his art, prefers to be engaged *making pictures* instead of replying to those who try, with a kind of glorified pleasure, to prove there is nothing in pictorial photography, and, if there is, it doesn't matter? I have only recently had to help to teach a writer in a contemporary, who knows something of art, that it is possible for photographers to be artists—I hope successfully; and now I hear I am expected to reply to a reader of a paper, who, I hope, won't think I mean unkindly when I say that, if he would study the subject diligently for a few years, he may learn something about it. At present I feel that Mr. R. Child Bayley knows more about photographic chemistry, and possibly X rays, than art. I give him every credit for a knowledge of his own department, with which I never interfere or pretend to know anything. There is much that I agree with in his paper on *Photographic Societies and Photographic Art*, but also, I regretfully notice, much that is unworthy of Mr. Bayley.

As to replying to Mr. Bayley's paper, I am quite satisfied with what was said in the discussion when the paper was read at the Photographic Club (I thank Mr. Bedding and Mr. Welford especially); but I must say I agree with him particularly when he says that too many read papers on subjects of which they know little or nothing, and I greatly regret that this paper of Mr. Bayley's almost compels me to add him to the company. Nothing has ever been more definitely and unanimously acknowledged, by friends and foes all over the world (always excepting Mr. Child Bayley), than the vast improvement in pictorial photography since the institution of the "Linked Ring," and I feel hopeful about Mr. Bayley. When he grows older—I, of course, mean in knowledge—he will re-read his first crude attempt at giving his opinion on this subject, and be sorry. I have known similar cases.

Another reason for not adding to this letter is that I want to avoid saying anything to make Mr. Bayley angry, as the time is fast coming when I shall want him to "cheer up" and be a good Conventioner. I know from personal experience that he shines as a Conventioner.

H. P. ROBINSON.

CARDIFF EXHIBITION.

To the EDITORS.

GENTLEMEN,—I notice in your paper a letter signed by Mr. Freke. Mr. Freke is a friend of mine and a highly respected tradesman in the town of Cardiff. He is a picture dealer, an enterprising exhibitor of pictures by celebrated artists. He runs an artist colourman's and fancy shop, and takes photography as one branch of his business.

Mr. Freke accuses certain members of the Cardiff Photographic Society of running a studio in the Exhibition for profit. Well, Mr. Freke is also a member of the Cardiff Photographic Society, and he runs a studio in the town. I am sure I hope on the same lines which is also the case with several other esteemed members.

Mr. Freke was offered the studio, but he said it would cost a hundred pounds to build it, and 4*l.* a week for an operator besides other expenses, so as he did not see how it was going to pay, he declined to have anything to do with it. That, I may say, was the opinion of all the professional photographers in Cardiff including myself, so, very much against the grain, the individuals who obtained the concession have had to engage two professional operators and assistants, and to run the studio themselves, and we quite agree with Mr. Freke that there is nothing in it.

With regard to the letter from Mr. Horton, I, not having the pleasure of that gentleman's acquaintance resolved to interview him. I found a shop, the window filled with photographs, and a card stating the price was from 3*s.* per dozen, there was also a pole projecting from the front-door. I turned the handle, and to my astonishment found myself in a barbers' shop. I was informed by the "operator" of the scissors that the price for hair-cutting was threepence, but, on my suggesting a combined price for the hair cut and the photograph, he called down Mr. Horton, and I had the honour of an introduction to that gentleman. I may add, Mr. Horton is also a skilled musician, and used to play the flute at the local theatre; but I presume he considered that, being a photographer by profession, he had no right as an amateur to deprive a professional musician of his living, which is, of course, greatly to his credit.

13, *Wellford-road, Cardiff.* WM. BOOTH.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Percy P. Hore, 50, High-road, Kilburn, N.W.—*Photograph of lady.*

Henry Goldsmith, Hay Cottage, Glen Aldyn, Ramsey, Isle of Man.—*Photograph of interior of Sod Cottage, thatched, near St. Indes, Andreas, Isle of Man.*

Joseph Smith, 7, George-street, Stroud, Gloucestershire.—*Two photographs of opening of new Conservative Club at Stroud, Gloucestershire, by the Right Hon. Lord George Hamilton, M.P., Her Majesty's Secretary of State for India.*

RECEIVED:—NEMO; JAS. MACPHERSON; C. KENNARD; JAS. PARKINSON; A. HOLLIDAY; "PATENT," and others. In our next.

RIVES PAPER.—J. HARRISON (Burton-on-Trent). The address of the makers is Rives, France. Messrs. Marion & Co. are the agents for it.

PATENT FOR INVENTION.—B. W. W. Registration would be of no good whatever. To secure the invention to yourself, it must be patented.

SUGGESTION.—C. MOLLOY. Thanks for the suggestion, but we think the subject would be an unsuitable one to be dealt with in our columns.

COPYRIGHT.—LANTERNIST. If the picture is copyright, it will, of course, be illegal to copy any portion of it, even the two portraits out of the several dozen.

PHOTOGRAPHIC CHEMICALS.—S. G. R. The address of the firm is Wolverhampton. We are not aware if it makes a speciality of photographic chemicals.

FERROTYPE.—F. I. We do not know, unless it is Walter Tyler, 48, Waterloo-road. If you cannot get them there, or at Fallowfield's, probably either would procure them to order.

VARNISH FOR NEGATIVES.—DAMMAR. Dammar dissolved in benzole will form a varnish that may be applied to the negative cold, and will dry transparent, but it is not a good varnish for negatives that have to be much used, as it is very easily scratched and injured. It is very suitable for glass positives, however, as they are protected by the glass.

TONING.—J. J. JONES. Collodio-chloride paper may be toned in the combined bath, but that bath is no more to be recommended for that paper than it is for gelatine papers, where permanence is an important consideration.

ASSISTANTS AND THEIR GRIEVANCES.—CELTIC. We think it preferable not to publish your letter; your case may have been, and probably was, hard, but it has little or no bearing on the subject at present being discussed in our columns.

X RAYS.—T. BELL. A coil, such as used for medical purposes, is quite useless for photographing by the X rays, even if you were to substitute a Grove battery in place of the Smee, with which it is at present fitted. It is not a question of battery, but coil, in your case.

RETOUCHING.—S. R. The retouching is very neatly done, and shows no traces of the pencil, but all modelling is destroyed. The face reminds us of the wax figures shown in hairdressers' windows rather than of a living being. For that reason we cannot pronounce it good.

THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.—RITCHIE & CO. write: "Could you favour us with particulars for sending exhibits to the next Photographic Exhibition, or let us know to whom to apply for same?"—In reply: See particulars in another part of the JOURNAL.

DARK PYROGALLIC ACID.—ZERO. If the crystals of pyrogallic acid "have become quite black with age," we should say that it is of little use for developing with. However, it is a very little trouble to try it, by making up some developer with it and see the result in practice.

STUDIO AND BLINDS.—T. BLAGROVE. Either the ridge roof or "lean-to" form is preferable to the studio shown in the "B" sketch. That form of studio, though at one time advocated by some, is one that is seldom adopted by first-class photographers, except for purely copying purposes—green or dark blue blinds for the south side, and unbleached for the other.

STUDIO.—R. OSMAN. We are not at all in favour of the form of studio shown in the sketch for portraiture. The ridge roof, or "lean-to" form, is far preferable for the professional portraitist for general work. For reproduction work solely, the sketched form would be very good. From twenty-five to thirty feet long by from twelve to fifteen feet wide will be good proportions.

TONING.—PRINTER writes: "The enclosed print was toned in the tungstate bath, as recommended by Mr. John Robson about twelve months ago. I have followed the instruction exactly. Why should it be this nasty colour?"—If the bath be the ordinary tungstate bath, the print should not be that colour. Possibly, however, the paper is not one that is best suited for that bath.

PLATE BACKING.—R. SMITH. Certainly there will be a great gain in backing the plates for photographing the interiors of the greenhouses. With the majority of plates it would be impossible to get such results as would satisfy the florist without. You cannot do better than use this formula: Gum solution, 2 ounces; caramel, 2 ounces; burnt sienna, 1 ounce; methylated spirit, 5 ounces.

DISINFECTANT. FLIES IN STUDIO.—BIRMINGHAM writes: "Kindly inform me in 'Answers to Correspondents' if permanganate of potash will do for a disinfectant. Also, can you suggest a remedy to keep away house flies in studio?"—Yes: it is a good disinfectant. Flies have an objection to the smell of carbolic acid, and avoid it; so they are said to have to eucalyptus oil. Sprinkle a little of either about the floor of the studio.

BROKEN PLATES.—C. W. complains "that, upon opening two packets of half-plates, he found four out of the two dozen broken. He asks who should bear the loss, the dealer from whom he bought them or the maker, as he had the same thing happen before, and there ought to be some redress, he says?"—The makers, of course, take no responsibilities after the plates leave the works, and we should expect the dealer to decline to make any recompense.

RAIN WATER.—R. CONYER. Theoretically, rain water is as good as distilled water; but, as a matter of fact, it is, when caught from the roofs of buildings, or is collected in the neighbourhood of towns, a very impure article, and quite unadapted for photographic purposes. Ordinary tap water, or well water, is therefore far preferable to "rain water." If the ordinary supply water be boiled, it will be improved for photographic use—making solutions, &c.

CELLULOID AND ELECTRICITY.—H. O. M. O. writes: "Celluloid is said to be a highly electrical substance. Is there not a great danger with cut films, when handled, generating sufficient light to fog the films, and may not the deterioration of films from fogging be attributed to this cause?"—It is quite true that celluloid is an electrical material, but it is very unlikely that, in ordinary handling, sufficient electricity is evolved to emit light enough to fog the negatives.

STOPS FOR LENS.—M. W. R. writes: "Having purchased a 10×8 portrait lens, by Darlot, without stops, could you tell me in your next issue the diameters they should be. The focus is 13¾ of an inch."—The focus quoted, if the lens be for 10×8, is probably the back focus. It is from the equivalent focus that the stops are calculated. Find the equivalent focus, and on page 959 of the ALMANAC you will find a table and diagram giving the size of the stops according to the Photographic Society's standard.

KINETOSCOPES.—SEASIDE says: "Can you oblige me with the address of a firm supplying the kinetoscope, or a machine suitable for a show at seaside? Through my premises changing hands I am without a studio, and am anxious to get something to fill up the time usually occupied by studio work."—We think the Edison Company, Brook-street, Holborn, can supply you with what you require. Write them.

STAINS.—S. & CO. write as follows: "We are sending you a print very much stained. It has not been printed six months, and has been carefully stowed away all the time. You will see it is an ordinary P.O.P. print, toned in separate bath—sulphocyanide, &c. We have had several prints go the same way, not in batches, but one or two here and there. Can you give us any clue to this cause of fading?"—The cause is clearly due to imperfect fixing. Probably the print stuck to another or to the bottom of the dish, so that the hyposulphite did not have free action to it.

LENS FOR HAND CAMERA.—T. SIMMONDS. The most general focus lens for a quarter-plate hand camera is that of the one you have—five and a half inches. Of course, a shorter-focus one would include a greater angle of view, and one of four inches a much greater angle; but you must bear in mind that, with such a lens, the plate will not be so well covered at the edges, also that a small stop will be requisite to get anything beyond a lantern size sharp, and consequently the lens will be slower than that you have. Why not have two lenses, and only use the shorter focus one as occasion may require?

APPRENTICESHIP.—A. W. C. If you were apprenticed for three years to learn photography, you ought not to have spent two years and a half of the time in picture-frame making and mounting, and the law will give redress. As, however, you are not of age, you cannot institute proceedings. They must be taken by your mother, who paid the money. The return of that and damages may be sued for. Too many who take apprentices think more of getting the premiums and the services of the apprentices for nothing, or a merely nominal wage, than fulfilling their portion of the contract, teaching the apprentice the business.

BUSINESS WANTED.—MAD asks: "The points I want information upon are: 1. How should I set to work to find a good firm who would take me as a partner? 2. If by advertising, would the annexed be a suitable way of putting the matter, or could you suggest any improvement? 3. What would be a fair price to pay for a half share in a good concern, which would surely bring me in about 300*l.* a year as my share? 4. Would a respectable firm allow an investigation on my behalf by a solicitor or accountant?"—In reply: The advertisement as sent will, doubtless, bring replies answering Nos. 1 and 2. We do not think it can be improved on. 3. This question is rather beyond our scope. 4. Undoubtedly.

FINISHING BROMIDE ENLARGEMENTS.—J. HERBERT says: "I should be much obliged if you would kindly tell me whether it is harmful to a bromide enlargement to take out the brilliant lights with bichloride of mercury; and, if so, what is the best means of doing it? also what ought to be done to prepare the surface in order to work on the same with water colour, as I find it impossible to lay on a flat wash?"—A solution of bichloride of mercury will destroy the silver image where it is applied. We should not, however, recommend its use for the purpose suggested. A wash over with a dilute solution of ox gall, as supplied by artists' colourmen, or rubbing the surface over lightly with an ink-eraser, will, no doubt, get over the difficulty.

EMPLOYMENT IN AMERICA.—ALPHA BETA writes: "In a few weeks I am leaving England for America; can you tell me what chance I shall have out there of getting on (I am a general assistant and retoucher, but cannot operate much), the name of the paper that inserts advertisements for assistants, and its price, also the average salaries that assistants earn?"—In reply: We do not think, from inquiries made, that our correspondent will stand any better chance of securing employment in America than here at home—especially with such limited qualifications as he appears to possess. Probably the *Photographic Times* (New York) is the best paper to advertise in. Write the publishers. The average salaries are probably not higher than those paid in England; but we cannot say definitely.

FERROTYPE.—DAN OSBORNE writes: "Please help me out of my difficulty. 1. What are those white streaks on plate? 2. The cause? 3. And prevention? The plate does not become a nice creamy colour in sensitised bath. I have fused bath, but to no effect. Bath is forty-five grains to ounce. I bought collodion ready-made. 4. Is Mawson's collodion reliable? 5. Is it best to have iodiser separate? 6. Does commercial nitrate of silver require to be fused? 7. What is best book on ferrotyping?"—1, 2, 3. The "streaks" are what are known as "oyster-shell markings." One of the principal sources of the trouble is the silver solution not being thoroughly drained from the plate before it is put into the slide, and then, after contact with the corners of the carrier settling over the plate. Remedy: Drain the plates well, and put blotting-paper at the bottom of the carrier and on the corner wires, to absorb the silver solution. A newly iodised collodion is more prone to the markings than one that has been iodised a month or two. Forty-five grains to the ounce is too strong for the silver bath: thirty to thirty-five grains would be better. Possibly some of the iodide of silver was redissolved by the strong solution. 4. Yes. 5. Yes, if the collodion is bought in large quantities at a time. 6. No. 7. Fallowfield, we think, issues a work on ferrotyping.

*** Several answers to correspondents unavoidably held over.

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EX CATHEDRÂ.

We have received an intimation from the Council of the Bristol and West of England Amateur Photographic Association that the Triennial Photographic Exhibition promoted by that body will be held in the galleries of the Academy of Arts, Queen's-road, Clifton, Bristol, from Monday, December 14, 1896, to January 23, 1897. Fuller particulars will be found in another column. We retain a vivid recollection of the magnificent Exhibition held in 1893-94, the best works of several preceding years finding place in the lofty and spacious suite of galleries the Association were fortunate enough to obtain. We have no doubt that a similar success awaits the Exhibition for which preparations are thus early afoot, and that every effort will be made to bring before the West of England a display in all respects representative of present-day photographic art.

* * *

Some weeks ago, in commenting upon a photograph of the finish of the Inter-'Varsity Boat Race that had been sent us, we remarked that, in the future, photography might supersede the distance Judge, and automatically record what is now largely matter of guesswork. The following extract from a contemporary, indicating that photography has been employed to record the appearance of a boat's crew at practice, suggests that, as we ventured to hint, the camera may yet be called in to act as an automatic judge as well as an automatic "coach":—

* * *

"The latest use of the photograph in America is to take snap-shots at Yale's Henley crew at practice for the use of the coach when too busy to leave his office at Brooklyn, seventy-five miles away from the course. These photographs, which are taken at various moments during the practice of the crews, carefully record every change or fault, no matter how insignificant. They show defects that the inexperienced would hardly expect to find in a 'Varsity crew. A few have been reproduced in the journal, and they make very interesting studies. One brawny fellow is looking at his oar, contrary to the rule 'eyes in the boat.' Another has buried his oar halfway up to the outrigger. Other photographs show one or two members of the crew too far forward or too far back, unevenness of the stroke, where a man is too slow or too fast in the 'catch,' improper method of recovery, shoulders doubled up, or one shoulder lower than the other. This novel experiment of coaching at long range is said to have proved most satisfactory in its results, for not only does the coach see the faults and suggest corrections, but the men see themselves, and, understanding the defects more fully, seldom repeat the error."

* * *

Mr. H. Piquet, of Port Talbot, forwards us an embossed photograph which is simply backed with a tin shield, thus dispensing with the use of wadding, which is commonly employed for the purpose. The metal shield prevents the photograph from losing its shape, and Mr. Piquet informs us that, in the process of mounting, there is no more trouble with the shield than without—in fact, his mounter finds less, and a better and a more even embossing is possible. The shields are made to various sizes and shapes; they will be supplied commercially.

* * *

With reference to our remarks on the suggested meeting of the Convention next year at Norwich, a friend draws our attention to the fact that, contrary to our statement, Norwich has a Photographic Society—the Norfolk and Norwich Camera Club, which, no doubt, would be pleased to assist in the arrangements if Norwich is selected for the place of meeting.

Great Yarmouth, which is about twenty miles from Norwich, has two photographic societies from which help might also be forthcoming. We gather that many local photographers are in favour of having the 1897 Convention Meeting held at Norwich, and we should be pleased to hear that a movement is to be made with a view of taking the matter into consideration.

* *

As to the Leeds meeting, we give elsewhere the official particulars of the week's programme, which will, no doubt, prove useful to many Conventioners desirous of making their arrangements well in advance. We also take the opportunity of drawing the attention of dealers and the trade to the fact that the Council will be happy to receive applications for wall or table space for the exhibition of their specialities.

* * *

THE Exhibition will be held at the rooms of the Leeds Philosophical Society, Park-row, and the Hon. Secretary of the Local Committee, Mr. Godfrey Bingley, of Thorniehurst, Headingley, Leeds, will give every information as to space at disposal, or inquiries may be addressed to Mr. R. P. Drage, Hon. Secretary and Treasurer, 95, Blenheim-crescent, London, W.

* * *

MR. ALFRED MASKELL, the Hon. Secretary of the Photographic Salon, writes: "Will you allow me to state that the Photographic Salon, 1896, will open at the Dudley Gallery on September 24, and continue open until November 7. I beg to send herewith a copy of prospectus and entry form. The regulations regarding the sending in of exhibits differ slightly from those in previous years, and we should feel obliged by your giving publicity to the same. It will be seen also that the list of the General Committee has increased in number. Entry forms will be sent out in the usual way early in August, and may be obtained also after that date on application to me at the Dudley Gallery."

* * *

THE varied nature of some photographers' businesses was brought home to us the other day when Mr. F. A. Bridge, of East Lodge, Dalston-lane, showed us some specimens of the work he has been called upon, from time to time, to execute. The well-known Universal Provider, Mr. W. Whiteley, of Westbourne-grove, possesses at Hanworth an estate devoted to the growth of fruit and vegetables; the breeding of dogs, pigs, fowls, &c.; dairy-farming; jam-making; and many other allied purposes. With his usual enterprise, Mr. Whiteley some time ago issued a handsome volume fully descriptive of his little estate, and illustrated by half-tone reproductions of over 150 photographs taken by Mr. Bridge.

* * *

ONE might say that in this collection of photographs Mr. Bridge covered almost the entire range of ground which the professional has to traverse in the course of several years. Fruit-picking, cottage architecture, animal portraiture, groups, men and women at what we may conveniently term factory labour, dark interiors, machinery, loading and unloading produce, and a score of other subjects incidental to farm work came in for treatment, all, we need scarcely say, with the most successful results. Another series embraced such prosaic objects as foundry interiors, portions of iron bridges, sewer tubes, the ruins of fires, walls more or less disintegrated, ships' saloons, and so forth. Mr. Bridge never exposes a second plate on one subject.

* * *

"THERE'S not much 'art' in such photographs," smilingly remarks Mr. Bridge, and, while we yield a partial assent to the statement, we recognise his work as admirable examples of the every-day or bread-and-butter aspects of photography. There may not be much "art" in successfully taking a difficult interior or a group of restive dogs or cattle at the first time of asking; but there is great skill, and no inconsiderable hard work. We hear so much spoken, and read so much that is written, of the importance of the art side of photography, especially by non-professional men, that it becomes positively welcome and refreshing now and then to be reminded that modern photography has its utilitarian side, in which the qualities needed for success demand a degree of application, persistence, and knowledge such as are probably not dreamed of by those who are never called upon to exercise their photographic abilities in that direction.

DAGUERREOTYPES: THEIR STABILITY AND THEIR RESTORATION.

THE interesting demonstration of the Daguerreotype at the Photographic Club recently, by Mr. Frank Haes, will not, we suspect, induce many modern photographers to essay its working, although it was mentioned incidentally that it is at the present time being worked in America.

The extreme care and precautions necessary in the manipulations, as they were pointed out by Mr. Haes as he went through them, seemed to take many by surprise. An opinion we heard expressed afterwards was that the amateur of old, who practised Daguerreotype, must have been of a very different type from the majority of modern ones, who now expect everything supplied ready for use. It is tolerably certain that few will now be likely to take up Daguerreotype, notwithstanding the beauty of the results obtainable by it and their stability.

It may appear a little anomalous to speak of the stability of a thing and its restoration in the same breath. The Daguerreotype is, however, the most permanent of all silver processes, though many examples are now in a bad state.

A Daguerreotype does not fade in the sense that a paper picture fades; the image does not fade away, but the metal plate tarnishes if the atmosphere gains access to it, in the same way that all silver goods become tarnished. It is this that obliterates the image; remove it, and the picture is as good as ever. When a Daguerreotype becomes tarnished, it will be found that the binding of the plate, matt, and glass together was imperfectly done, or that it has become loosened since, and so admitted air. It may be mentioned that this is not the first time that the restoration or cleaning of Daguerreotypes has been treated upon in these pages, yet we are continually receiving letters seeking information on the subject, also at times laments on account of accidents while attempting the work. Those who were at the Club the other night would not be surprised at this in the hands of those who are only familiar with the manipulation of gelatine plates. Although the Daguerrean image is the most permanent of all silver ones, it is, at the same time, the most tender in a mechanical sense. The least friction, even the lightest rub with the finger, is sufficient to remove the image. Lack of this

knowledge has led to many highly prized pictures being irretrievably ruined.

Here is the method of cleaning in practice. First make up a solution of cyanide of potassium, strength, say, one drachm to the ounce of water; then take the picture out of its case and clean off the paper or gold-beater's skin, with which it is, or was, secured to the matt and glass, taking care that none gets on the front. Blow off any dust that may be on the surface—the image is too delicate for a dusting brush. Now have at hand some alcohol, distilled water, a spirit lamp, and a pair of pliers. Holding the plate by one corner, flood it with spirit for a minute or two, or until it takes evenly to the metal. Then wash under the tap till all greasiness disappears. Next take some of the cyanide solution and dilute it to about eight or ten grains to the ounce, and flow evenly over the plate, keeping it rocking to and fro, and pouring it on and off, particularly *on* to those portions where the tarnish is greatest. In a very short time the tarnish will begin to disappear. If it does not, the cyanide solution must be strengthened. It is, however, better not to use a stronger solution than can be avoided. Instead of pouring the solution on the plate, a dish may be used, but we prefer the former plan, as it admits of a certain degree of local application.

When all the tarnish has been removed, the plate is well washed back and front under the tap to get rid of all traces of the cyanide. If the plate were now dried, the picture would be considerably marred by a thin veil from impurities in the water, hence it must be well rinsed with distilled water. The drying of a Daguerreotype plate is a rather important operation. If it were allowed to dry spontaneously, it would be covered with wavy marks, therefore it must be dried by heat. Light the spirit lamp and take the plate firmly with the pliers by one corner, give a final rinse with distilled water, and drain off at another. From this time the position of the plate must not be changed until it is dry. Now bring the top corner of the plate—that diagonally opposite the one from which the water was drained—just above the flame of the lamp, and, as it dries, gradually bring more of the plate over it, so that the drying proceeds uniformly from the top downward. If the drying be checked at any point, a mark will be the result. The picture should now be replaced in its case without delay. The plate must be bound round with paper or gold-beater's skin to the mat and glass so as to make it perfectly airtight, and starch or flour paste is preferable to gum for the purpose of an adhesive, as the latter is prone to split from the metal if it becomes very dry.

The object of the treatment with the spirit is to cause the cyanide to take evenly, as some Daguerreotypes are very repellent and then stains might arise. If the picture were well gilded in the first instance, it will now be restored to its original beauty, and will, if perfectly protected from the air, last, practically, for ever. So indeed it would have done if it had been properly secured when it was first produced. It will be seen that the restoration of Daguerreotypes is a very simple affair. Simple though it seems, it requires some judgment, and we should not advise any one to make his first attempt on a highly prized portrait. Rather than do that, it would be better to intrust the work to an expert, or to get one or two valueless ones to experiment upon. In any case it will be better for the novice to make a copy of the picture before cleaning it, so as to be able to fall back upon that in case of any accident to the original.

Illegal Use of the Royal Arms.—A case of some interest to those photographers, as we believe there are several, who use the Royal Arms without the authority to do so, was heard at the Marylebone Police-court a week or so back. Four West-end tradesmen—a carver and gilder, a milliner, a stationer, and a baker—were proceeded against for having, without authority, assumed and used in connexion with their business the Royal Arms, or arms so nearly resembling the same as to be calculated to deceive and lead to the belief that the businesses were carried on under Royal authority. The prosecution was instituted by the Incorporated Association of Her Majesty's Warrant-holders. This Association, it may be mentioned, is a number of tradesmen, who have the Royal warrants, banded together to protect themselves against persons illegally using the Royal Arms. The prosecution did not press for the full penalty, which is twenty pounds, but for a nominal one, as an undertaking that the use of the arms would be discontinued. Upon the defendants giving this undertaking, they were each fined the mitigated penalty of forty shillings and costs.

THE defendants pleaded ignorance of the law, but the magistrate (Mr. Plowden) said that he should have thought it common knowledge that permission had to be obtained before a tradesman could use Royal Arms. We have little doubt but that several photographers who are using the Royal Arms are doing so quite in ignorance that they are breaking the law. Hence our giving prominence to this prosecution. Some we know are under the impression that, if they have supplied anything to her Majesty, or may have executed an order for her, they have forthwith the right of putting up the Royal Arms. Such, however, is not the case. No one is entitled to use the Royal Arms without a special warrant to do so under a penalty of twenty pounds.

IT may not be known to every one that it is illegal to use the terms "Patent," "Patented," "Registered," or such terms as would imply that the article was patented or registered when it is not. The penalty in this case is, on summary conviction, five pounds. We merely mention this, as we often see on photographs the work "copyright," although we have known there was no copyright in the work.

A Caution to English Tourists Abroad. — Three English cyclists, with hand cameras, found themselves in an awkward dilemma last week in France. While at Stenay, the Sixth Army Corps were under review, and they took some snap-shots of it without being aware that they were doing anything wrong. However, they were quickly arrested, and they were detained during the whole of the time the review lasted, and then subjected to a severe verbal examination. Finally, they were liberated, but not before the general staff had departed. This incident should serve as a caution to English photographic tourists in France as to the indiscreet use of their cameras. Things are different on the Continent from what they are here. A hand camera, we suspect, would not be objected to at any of our military displays.

THE above incident, occurring just at the opening of the touring season, leads us once more to suggest that English tourists, with cameras, on the Continent should provide themselves with passports before starting, although they may not be required by law in the countries in which they travel. Any one not knowing the laws and regulations of a country may innocently transgress, as in the case of the three Englishmen just cited, and the possession of an English passport is usually, on the Continent, taken as a guarantee of the owner's *bona fides*, and thus helps him out of the difficulty. A passport is obtained without trouble, and its cost is but nominal. It will do for all countries, and will serve for all time. To be "run in" in a foreign country, while on pleasure bent, from an innocent cause, even for a few hours, is not pleasant; and, although the passport will not avoid the arrest, it will generally hasten the release.

Picture Exhibitions.—The picture season is now "full on," and each season seems to bring forth more exhibitions than the previous one. A glance down the advertisement columns of the *Times*, or any of the leading papers, will give evidence of this. Fine Art Exhibitions, at this season, are not confined to England, as there are at the present time similar shows in all the principal Continental cities. On Monday, last week, the Annual International Art Exhibition at Munich was opened at the Glass Palace by the Prince Regent. The Bavarian capital has always been an art centre, and its annual exhibition generally includes some of the best works of the leading artists of all nations, England usually being well represented. This year there are some thirteen hundred works shown, and we learn, from private sources, that the Exhibition is quite up to, if not beyond, the average, and that means a good deal in Munich.

An Amateur's Business Matter.—On the occasion of the Croydon Camera Club's visit to the new municipal buildings recently opened by H.R.H. the Prince of Wales, at the invitation of the Mayor, the President, Mr. Maclean, drew attention to the fact that the proprietor of a local paper had specially invited *amateurs* to submit photographs of the Royal visit for publication. He explained that the trade custom was not to accept less than 10*s.* 6*d.* for each print, and urged the members of the Club not to undersell each other or spoil the market by offering prints for less than the standard minimum. The report says that these remarks were well received by those present. It is to be hoped that none have let their pictures be used for any less sum than that mentioned, thereby underselling the professional photographers. Some illustrated papers just now are very anxious for amateurs' work, thinking, no doubt, that they will save the fees charged by the professional, and we are pleased to see that all amateurs do not swallow the bait.

The Spitzbergen Expedition.—This Expedition, under Sir Martin Conway, is now on its way, having left Hull on Tuesday last week. A well-known member of the Alpine Club, who is a geologist and a good photographer, forms one of the party. As this Expedition will not proceed to the extreme northern regions, and will only remain during the summer months, the plates taken are not likely to be exposed to long-continued extreme cold, as in the case of other Northern expeditions. It would be interesting to know how gelatine plates will behave after being subjected to abnormal cold for a lengthened period, and then exposed under similar conditions of extreme cold. None of the Arctic expeditions have supplied reliable information on this subject up to the present.

Photographing Stars with a Small Telescope without a Driving Clock.—Many amateur photographers with a knowledge of astronomy have been debarred from joining their two hobbies through not being able to incur the expense of the driving clock, usually considered a necessity for the work, but in a recent number of *Nature** Mr. Joseph Lunt has a valuable article showing how to perform much interesting and useful work with no special apparatus whatever—no clock, no driving machinery, not even a tangent screw and slow-motion rod. He very rightly observes that "when amateurs come to recognise that, with their small instruments, such a fruitful field of investigation is open to them, astronomy will probably be enriched by many discoveries which would otherwise be missed or delayed." He gives in the article referred to an illustration of the home-made apparatus employed. His telescope is three and a half inches, mounted on a firm equatorial stand, supported on a home-made brick pillar. It is mounted on a home-made wooden tube of square section, and on the opposite side of the axis is a second telescope, used as a finder. Attached is also a small finder, and, in addition, a fourth optical arrangement, neither more nor less than a small camera, with a two-and-a-quarter-inch portrait lens. The latter is used for obtaining duplicate photographs on a small scale simultaneously with the larger. "As regards the actual driving of the apparatus, very little power is required, as gentle pressure of the finger at the lower end of the baseboard carrying the objective and the plate is sufficient to move the telescope at the proper rate, and the co-operation of hand and eye during finding seems soon to become almost automatic in character." Good and useful star charts can be obtained, Mr. Lunt states, by means of the photographic camera alone, and without any motion, about fifteen seconds' exposure giving good results, the stars, of course, showing as trails instead of dots. To use the finding telescope, the image of a star much out of focus was observed, the eye being kept constantly at the telescope, so as to keep the image constantly in the centre of the crossed lines. As the size of instruments indicated are not larger than those possessed by many an amateur observer, it is to be hoped that Mr. Lunt's method may be the means of increased pleasure and usefulness to many an amateur photographer and astronomer.

* *Nature*, No. 1387, October 4, p. 85, *et seq.*

Eclipse Preparations.—As the time of the August eclipse approaches, it is rendered evident that observations will be made by astronomers from all quarters of the globe. From this country the observers will mostly proceed to Norway, but Mr. Maunder and some American astronomers have selected Japan, and have already sailed *en route* for that country. Unfortunately, from statistics furnished by the Japanese Ministers, the prospects for fine weather are distinctly bad. For the last five years, the average gives for the month of August—cloudy days, 22; rain or snow on 22 days; clear days, 0! Mr. Norman Lockyer desires to erect his station on the south side of Varanger Fjord if possible, and, to ascertain whether it will be available, Captain King will be detached from the Squadron to investigate. The eclipse will be visible from many parts of Russia, and the various societies and learned bodies will send representatives to Nova Zembla, Olenkminsk, the Mourman coast, and Uleaborg in Finland.

The High Price of Camphor and Photography.—There would seem to be no connexion between the gradually increasing price of camphor and the pursuit of this favourite science; but Professor Abel, after having shown that the notion that the use of camphor in smokeless powder has caused such demand as to increase the price is entirely fallacious, points out that, in all probability, the cause is owing to the large use made of camphor in the production of celluloid, so largely used of late in lieu of glass for photographic and other purposes.

Röntgen Sciography.—Steady work is now being carried on by scientific men in investigating the cause and actual character of the rays; but they seem to be as far off as ever from arriving at a decision. The theory at one time advanced, and afterwards mostly rejected, that they are a form of ultra-violet rays seems again to be attracting more attention and receiving support. Professor Hartley gives four points in common between the ultra-violet and the Röntgen rays. Attempts have been made to polarise them; but, though there is some little doubt as to the bearing of the experiments, they seem, on the whole, to indicate non-polarisation. Mr. T. C. Porter of Eton College, has been endeavouring to analyse them, and finds himself able to divide the radiations into two qualities which he provisionally terms X_1 and X_2, the former possessing the usual character, and the latter being quite different; able, for example to pass through metal, the type of ray possibly which is able to pass through the metal screens and produce photographs of the solar corona in daylight, as described by Mr. Packer. At the University Extension College, Reading, Mr. George J. Birch in conjunction with his colleagues, has been utilising the Röntgen rays for exhibiting the details of plant structure, and has obtained most interesting results, for example, the ovules inside an unopened bud, the seeds within a seed vessel, and even the veins in the petals of a white flower have been photographed.

The Queen of Portugal and the X Rays.—Queen Amélie has turned an investigation on the rays to a novel and praiseworthy purpose. She has been taking sciographs of the trunks of various Court ladies, exhibiting them to the subjects of the experiment with the purpose of demonstrating the evils of tight-lacing. This is truly bringing in science to bear on humanitarian objects.

BY THE WAY.

As I sit down to write, the weather is that of late summer or early autumn, instead of mid spring, and both light and temperature remind one of August rather than the early days of June. The "photographic campaign," as it was wont to be called, has fairly opened; and, with a fine Whitsun Bank Holiday just passed, it may be predicted with certainty that a large number of successful pictures have been already secured by the vast army of photographers who probably make that their opening day. Not that nowadays time and season matter much in photography, modern plates being quick enough to work as well in mid winter as in the height of summer, rain and fog being the only enemies the outdoor worker has to fear.

I was forcibly reminded of the immense difference that exists between the conditions now prevailing and those of twenty years ago on turning over a portfolio of miscellaneous photographs a few days ago. I had been making exposures of a fraction of a second on "ordinary" plates, the subjects being landscapes clothed in spring foliage, and, if anything, I could have done with a smaller stop or a shorter time. I came across an old photograph by a distinguished American amateur of days gone by, and still happily alive, Dr. Ellerslie Wallace, that brought vividly to my mind the difference I have referred to. The subject was a street scene in one of the old-time Continental towns, an albumen print that shows all the vigour and brilliancy for which the best work of twenty years ago was notable, combined with the delicacy and fulness of detail that is supposed to be the special feature of modern gelatine plates. From the particulars noted on the back of the mount I gathered that the picture was taken in July 1877, on a Fothergill plate, with a Ross seven-inch portable symmetrical lens, stop *f*-20, and an exposure of six and a half minutes! Think of that, ye modern "snap-shotters," and try to realise the difference in time only involved in the production of a dozen negatives, and the possible size of an afternoon's "bag" then as compared with now.

But the difference is by no means confined to the time question, more especially in the class of subject I have mentioned, or, indeed, in any kind of picture round about the usual holiday resorts. With an exposure of a part of a second, or even a few seconds, the photographer is comparatively independent of human interference, intentional or otherwise, if he lay his plans with ordinary circumspection; but think of the crowd of curious spectators and mischievous *gamins* that would collect together round the camera in six minutes, to say nothing of the unwitting interference of innocent passers-by! As an old worker of dry plates in days when exposures were reckoned in minutes instead of tenths of a second, I have painful recollections of many a half hour or longer spent in giving disjointed exposures which, when complete, perhaps only totalled up to two or three minutes; and only those who have experienced it can realise the intense pleasure that is to be derived from the badinage and "chaff," if nothing worse, of a half-hour's contest with an unruly crowd, who all wish to occupy the best, and, to the photographer, perhaps, most awkward positions in the picture.

But the culminating point of agony and wrath combined was reached once when photographing one of the prettiest of the numerous waterfalls in the English Lake district. All was quiet when I arrived on the spot, and every condition of light and freedom from wind was in my favour, and I anticipated nothing but a "good time." I had leisurely selected my point of view, and focussed to my satisfaction, when, on emerging from beneath the "velvet pall," to my horror, I noticed a crowd of people climbing down the rocks, and remembered that there was a "cheap trip" that day from one of the northern manufacturing towns. I was working at the time some, for the period, pretty quick plates, and hoped to get through with my exposure before the interruption of the crowd reached me; so I got my plate into position, and uncapped the lens with all celerity; but fate, in the shape of a sharp breeze, was against me, and I was compelled to cap the lens and wait for stillness, and before that came the enemy was upon me.

Not only upon me, but above, below, and all round me, and lunch baskets, bundles of sandwiches, and ginger-beer bottles figured in prominent positions on every coign of advantage. Polite requests for a clear view for only two or three minutes were utterly unavailing, and expostulation only led to vituperation of a kind that only the Lancashire factory operative can equal, and, as I was only one against thirty or forty, I had to content myself with patiently waiting until it should please my tormentors to take themselves off. For upwards of an hour and a half I stood by the camera to protect it from any accident that might chance to it from their horse play. One lout actually slid from a height down the rocks to within a foot or two of the tripod, and I must admit that it was with feelings not altogether akin to sorrow that I saw him picked up, bruised and shaken, and carried or led away by his companions. At intervals, when the coast was clear, I managed to get in a few seconds' exposure, and eventually, when it became necessary that they should retire in a hurry to catch the train, I accepted their final abuse with equanimity and even pleasure, and proceeded to finish my exposure with a feeling of satisfaction and a metaphorical "patting on the back" for my patience, that were eminently soothing; but this feeling was changed to the bitterest gall when I discovered that I had forgotten in my hurry to draw the shutter, and it was too late to commence afresh!

Then, again, from an artistic, or, rather let me say, from a *pictorial* aspect, how things have changed! I remember on another occasion in the Lake district, at the close of a summer afternoon, gazing on a scene that, if I could have transferred it to my plate, would have created a "sensation" in Pall Mall. I was standing on a promontory jutting out into Windermere Lake, with the ranges of hills behind Ambleside filling up the background, and the rapidly setting sun throwing long shadows of Belle Isle across the water in mid distance, while in the foreground a group of cattle, knee-deep in the margin of the lake cooling themselves after the heat of the day, completed a picture that would have been hard to beat. I had a plate left; but, if it had been midday instead of nearly sunset, it would have required at the very least a minute's exposure with the largest aperture I dare use; as it was, probably an hour would have been insufficient, so sadly did the dry plates of that day fall off in sensitiveness late in the day, so I was compelled to bear away the picture in memory only, instead of in more tangible form, where to-day I could have secured it easily, only, however, to take its place amongst others as a very ordinary piece of work.

That was some thirty years ago, but let us look back to a much later date—the early days of gelatine plates—and compare the work then with that of now. Probably many of my readers will remember, to select one example hap-hazard, Colonel Gale's picture of *Brixham Trawlers*, one of the "gems" of the Exhibition of 1879 or 1880. Simple in the extreme, a group of fishing boats exquisitely rendered, with the faint ripple on the almost still water, and the delicate haze or atmosphere of early morn or late afternoon—how it took popular fancy as a foretaste of the capabilities of the then "new" plates! but, now, probably, it would be passed over as a pretty picture, without doubt, but nothing out of the common.

Similarly, many will remember the famous *Swallow* picture of the same artist, and the sensation it caused, as well as the sharp controversy as to its genuineness as a pure photograph, the truth on that point having never yet, I believe, been authoritatively settled. Here was a picturesque pool of water, surrounded by trees, through which the sun glinted, causing a bright reflection in the centre of the pool, over which poised, "dipping his wing," was a swallow, so sharply defined that the markings of his feathers were clearly seen with a magnifier. Cruel critics, indeed, went so far as to say they could distinguish something put in by the "stuffer" to represent its eye; but, be that as it may, whether a live or a stuffed bird, it was so happily placed as to make a veritable picture, and was the admired of all visitors, and *the* picture of the show. If a similar picture of undoubted genuineness were produced at the present day, it would be accepted without surprise as a clever *coup-de-main*, rather than as a photographic achievement; its artistic merits might be undeniable, it would take rank as a *picture*, but would no more raise any question as to its method of production than if it were a painting.

Yet, with all our improved facilities in working, I question very much whether, at the present day, as good work proportionately is

done as was done twenty, or even thirty, years ago. Mind, I do not mean to say that, at the present time, there is not a far larger bulk of really good work done than was done in the old days, for that would be simply absurd; but, taking into account the possibilities of modern plates and the immensely larger number of workers using them, there is a far smaller proportion of pictures produced that can be classed as out of the common than was formerly the case. Take, for instance, from a purely scientific point of view, the historic picture by Fox Talbot, taken at the Royal Institution by means of the electric spark, of some printed matter attached to the periphery of a rapidly revolving wheel. With the sensitive, or rather insensitive, films of that day, this was a really wonderful achievement, as may also be said of the "instantaneous" pictures, some of which still exist, taken upon Daguerreotype plates forty or fifty years ago. Then, on the artistic side, reverting to Colonel Gale's *Brixham Trawlers*, at the time that picture appeared I had in my possession still—but they have now gone the way of too many albumen prints—some stereoscopic pictures of similar subjects which took a prize for "instantaneous" work given by the Amateur Photographic Association in the early "sixties." These consisted of sailing barges *Off Grays*, and, except in delicacy of definition, having evidently been taken with a very wide apertnre, were almost as perfect as the more modern productions.

I have just alluded to the way of too many albumen prints of fading, but I am far from being of opinion that it is an invariable or a necessary way. The picture I referred to in the early part of this article, by Dr. Ellerslie Wallace, was produced long before the days of gelatino-chloride, and has been in my possession at least fifteen or sixteen years. I cannot say the exact date I had it, and, though the mount has become dirty and *yellow*, the print itself is as rich in tone and as pure in the whites as if it had only been done yesterday. Some unmounted prints by the same artist—and I use the term in its fullest sense, given to me by himself on the occasion of one of his visits to this country in 1876 or 1877—were in an equally good state of preservation the last time I saw them, two or three years ago, in the album of a lady friend, who fell so deeply in love with them that I was reluctantly compelled to let her "annex" them. For which reasons—and many others of a similar character might be cited—I do not think that albumen prints are necessarily more fugitive than any others. It has been said that albumen prints *must* fade from their very nature, which I, for one, think absurd. On the other hand, it has been said, with more apparent truth, that, if an albumen print will keep for twenty years, or even for ten, there is no reason why it should not keep indefinitely.

The truth is, more depends upon the worker than upon the paper, and the reason why poor albumen has got such a bad name of late years is that the working standard is not as high as it used to be, or, in other words, the tendency to carelessness is greater. This, combined with the introduction of cheap and nasty papers, will, no doubt, account for the bad repute of an article that, if properly used, will answer the requirements of permanence, as has been proved beyond doubt for periods of twenty, five-and-twenty, and thirty years; and, if such periods as these, why not longer?

It is not with any intention of posing as *laudator temporis acti* that I speak of the lowering of the working standard. On the contrary, I believe that at the present day there are workers quite as careful as those of twenty and thirty years back, who possess, moreover, the additional advantage of a wider scientific knowledge of the processes and materials they use than was possible at the earlier period; but it is equally true that there are, in the ranks of photography, a vast number of workers to whom the scientific or technical side is but a nuisance and a bugbear, who follow photography simply for the sake of its pictorial results, and who only go through the mechanical part of the business if they do it themselves, because it is necessary to the end they have in view. It is chiefly these who bring discredit upon photography as a means of permanent record, not perhaps from inherent carelessness, but rather from insufficient knowledge. I know two or three of the class who are notable for their fastidious care and "finicking" ways in everything they undertake, but who make horrible messes of things generally in photography because they will not go deeply enough into its "drudgery."

The fact is, the whole face of photography has changed of late years. The best-known amateurs are those whose names are known through the prize-list, with a small scattering of scientists. The best known professionals are those who make our plates and papers, while the old "professional," the portrait photographer, keeps himself pretty much to himself. In former days it was the professional who talked "art" and picture making before the societies and who took most of the prizes, while it was the amateur who talked—"shop," I was going to say, or processes and formulæ; but we have changed most of that, and, as time wears on, no doubt the difference will be wider still.

Before closing this, I cannot help going back to a subject that has occupied a good deal of my previous contributions—carbon printing without transfer—but only to pass on a suggestion made by a friend of my own. It is this, that those who desire to avail themselves of the simplicity of the bichromated gum, or other non-transfer process, have only to procure a Levy screen and make "half-tone" negatives, which, if the ruling be fine enough, will entirely get over any difficulty in the matter of half-tone or gradation. A "half-tone" negative from a hard positive possessing over-strong contrasts can be made to yield a print of any degree of softness and delicacy on silver paper, if not carried to the degree of density required for etching, and without showing nearly so much grain as the etching would; and such a negative would be very suitable for carbon printing without transfer. Until it becomes feasible to produce such plates direct in the camera, there would, of course, be the necessity for reproduction.

"Clonmel" asks me a question or questions *re* bichromated albumen paper. I think his difficulties arise solely from not floating the paper long enough for the solution to penetrate to the albumen, which it will not do in *two minutes*, and from over-exposure.

DOGBERRY.

NOTES ON RADIOGRAPHY.

AT so early a date in the investigation of a series of phenomena, which will require years of research before any definite and conclusive results can be arrived at, I should feel great diffidence in addressing your readers were it not for the fact that so many misleading and inaccurate statements are daily put forward by the lay and scientific press.

In a paragraph of your issue of May 8, referring to some experiments made by M. G. de Metz, appears the following sentence: "He finds that the cathode rays possess one of the properties of the Röntgen rays, in that they penetrate aluminium, cardboard, and paper, but are stopped by platinum and copper." Some two months back I stated in public that, in my opinion, no substance is opaque (in the ordinary meaning of the word) to the so-called X rays, granting that a sufficiently lengthy exposure be given. At the present time, after numerous experiments, I see no reason to withdraw this statement; on the other hand, increased experience only serves to emphasise the fact. Whether or not the cathode rays pass through platinum and copper, I am unable personally to make a positive statement, but I am of opinion that they do not; but that the X rays do pass through these metals I am certain, and by way of proof I enclose a radiograph through eight metals, among which are platinum and copper. The negative from which this print was made was produced upon a Thomas's cathodal plate, with an exposure of five minutes, at six inches from a focus tube, made for me by Mr. Cossor, an eleven and a half inch spark being used.

I have succeeded, under the same conditions, in radiographing a sixpence through seven thicknesses of pen-steel, through five thicknesses of hard-rolled copper, and through eight layers of ferrotype plate. With ten minutes' exposure, at the same distance from the tube, I obtained radiographs through ten layers of pen-steel and seven of sheet-lead.

In an interesting article, *On the Progress in the New Radiation*, by Mr. A. W. Isenthal, in a recent issue, when speaking about the focus tube, the following statement is made: "The solid in the focus is mostly a plane piece of platinum, as it will allow no X rays to pass through, it being very opaque to them, but will reflect

them and send them all outwards on to the object to be radiographed." I have already shown that platinum is not opaque to the X rays, and, moreover, have failed to produce evidence of their being reflected by this metal.

My experiments lead me to the conclusion that the term "focus," as applied to this special form of tube, is not the right one. In the first place, we have not yet positive evidence that the X rays start within the tube; hence it is premature to surmise that platinum reflects these rays within the tube while it fails to do so outside.

That platinum stops the cathode rays has been demonstrated by Mr. Crookes, and, granting that it is a fact that the X rays start from the surface of the glass struck by the cathode rays, is it not probable that the metal, by confining these rays to a small portion of the tube, limits the area from which the X rays emanate?

As it is for various reasons impossible for me to manufacture and experiment with new forms of tubes, I make this suggestion, in the hope that some investigator who has facilities for so doing may use his endeavours in throwing light upon this most important question. A few days since an investigator published a list of substances which he states are opaque to the X rays. The enclosed radiograph clearly proves that four of the substances, viz., steel, copper, platinum, and nickel, are anything but opaque, and I have no hesitation in saying that the rays will pass through every one of them. The results here shown do not give the comparative transparencies of the metals experimented with, for the simple reason that there is very great difficulty in obtaining sheets of various metals of the same thickness; they are, however, as nearly alike as I can at present obtain them, and are sufficiently so to prove, at any rate, that they are not opaque.

My reason for burdening your readers is to draw their attention to the fact that they must not accept as gospel truth any and every statement which is set forth, even in the scientific journals.

HALL-EDWARDS, L.R.C.P., F.R.P.S.

P.S.—The rings in the enclosed radiograph are of brass, one-twentieth of an inch in thickness. They are placed upon the sheets of metal in order to show their transparency, as they could not be seen unless the X rays had passed through the metal.

1. Hard-rolled copper.
2. Platinum.
3. Steel.
4. Nickel.
5. Zinc.
6. Strips of aluminium.
7. Sheet lead.
8. } Brass brace buttons. These are interesting, as they show the
9. } differences of thickness.

[Dr. Hall-Edwards's radiograph lies at our office for the inspection of those interested.—EDS.]

A COMPARISON OF ORTHOCHROMATIC WITH ORDINARY PLATES.

I.

So much admirable information upon the subject of this paper has lately been forthcoming, that some explanation is due to my readers for adding this contribution to the already large mass of matter that has been recently published.

That I do so is because, in the first place, Mr. G. R. White, about the beginning of the year, gave an exhaustive address to the members of the Croydon Camera Club, in the course of which he was reported as making certain statements which were hotly challenged by several well-known writers upon photographic matters. Secondly, circumstances have ever since prevented Mr. White from recapitulating, with the necessary fulness and precision, what was the staple of his remarks on the occasion in question. He has therefore placed in my hands his notes and illustrations, and has further submitted himself to my cross-examination, so that I might be in a position to place before the photographic world what are the main conclusions at which he has arrived after careful and independent study and experiment.

I need hardly remind the average reader that what is termed *orthochromatic rendering* of colours in equivalent tone values is a subject which, *ab initio*, bristles with difficulty. To begin with, the comparative brightness of one colour to another is not by any means a constant value, but varies almost indefinitely, according to the individual colour-sensitiveness of the eye. Thus, in *extreme* cases, a full orange, but well-lit, cloud, standing out from a deep blue sky, may, to some eyes, seem as a dark against a light, which, although quite the reverse of how it strikes the average eye, is very much what a bad photograph might render. Besides this disturbing influence, due to the variable effect of different colours on different eyes, we are at the very threshold of any comparative test between makes of plates or systems of screening, &c., confronted with the difficulty of finding a *constant standard* of comparison which, with approximate accuracy, includes the conditions of lighting met with in ordinary practice.

Ever since the subject has been seized upon by the laboratory investigator, practical photographers have felt that, however true the conclusions drawn from particular series of experiments held under artificial conditions might be, the results did not of necessity affect practical photography; for, to commence with, the colours mainly relied upon have been what may be termed *pure* primaries, secondaries, or, more rarely, tertiaries. By pure I mean as pure as ordinary pigments make possible; but in every-day practice we never meet with pure colour. A cursory examination of almost any object will reveal that its colour is a very complex combination, capable of resolution into blue, red, and yellow; any how, the occasion will be rare indeed where an object does not contain a considerable proportion of latent actinic power due to this colour mixture; apart from which we have to consider the important bearing of reflected white light, *i.e.*, rays which fall upon the surface at such an angle as to escape selective absorption.

Place a *smooth, ruby-red* covered book on a table between yourself and the window, so that it lies about eighteen inches below the eye; at a certain distance, easily found by experiment, the cover will seem almost white, and, if photographed from the position in question, the resulting negative *might* be made to print the book cover as quite white, this notwithstanding that its colour is of the *most non-actinic* deep ruby red. On the other hand, if the surface were rougher, the normal effect would become, *pari passu*, less.

From these experiments it might, at first sight, be assumed that only smooth objects reflect any considerable amount of white, or almost white, light. The truth of the matter, however, is that where a surface is broken up, either by its main contours, or by the irregularity of its surface texture, the variously inclined planes thus presented so deflect the white-light rays that, although just as many may be surface-deflected, they do not assert themselves in any one particular direction, but are given off as scattered light.

Thus the total amount of white light emitted by a non-actinically coloured illuminated object may be not a whit less than in the case of the red book cover referred to above; but, instead of the object being partially illuminated by such white reflected light, the whole surface gives off a somewhat regular proportion of actinic rays, which are perfectly independent of the local colour.

Now, in copying coloured diagrams or charts, *special* arrangements are made, by means of side-lighting, &c., to, as far as may be, entirely eliminate the above "surface reflections," thereby falsifying the natural conditions which, except in copying pictures, &c., prevail.

It should also be remembered that the printed or painted pigment colour charts, although in some respects better than the spectroscopic tests, are so prepared that the results must necessarily be liable to mislead, for, without entering into technicalities of painting by means of stippling, glazing, hatching, and other resources, the difference between visual and photographic values may be very considerably varied; for all which Mr. White has illustrated his arguments mainly by means of photography of a colour chart which he has prepared for the occasion. This because one cannot well speak about the colour-rendering of a scene which is not before the eyes of an audience.

One merit the screen possesses is that it differs in its preparations from others.

To my mind the chief value of what Mr. White advances is that his testimony, as far as I can find out, is perfectly free from bias, and is that of a photographer who has been in active and varied practice for over ten years, during a considerable proportion of which time he, as Hon. Secretary of the Croydon Camera Club, has enjoyed the opportunity of comparing results obtained by members, some of whom being well-known experts in practical technique.

Partisanship, either for or against specially sensitised plates, is, no doubt, a great help to the cause of correct colour-rendering, inasmuch as the extremists on both sides give each other's arguments no quarter, and thus aid in establishing the real truth. Meanwhile the ordinary photographer, who does not want to wait until the wordy fray is done, will be, I feel sure, glad to hear what are the results of an independent examination of the question by one who has no axe to grind.

HECTOR MACLEAN, F.R.P.S.

THE SOLARISATION OF DRY PLATES.

[Photographisches Archiv.]

Examine from the back a number of finished negatives taken on dry plates. When the plate is held against a black background, a positive image may be seen on some, whilst on others this is not the case.

Although both classes of negatives have a corresponding black appearance when examined from the front, the former have a white colouration on the glass side, whilst the latter, in corresponding parts, are black.

This whiteness is due to a remnant of bromide of silver, which is left unchanged during fixation, and it is held between the reduced silver and the glass.

Negatives retaining bromide of silver are those that have been fully exposed. In under-exposed plates it is absent. It is only visible in the high lights in correct exposure, as, for instance, in the sky of a landscape.

In those parts of the plate fixation is not complete, and, if even more time had been given for the action of the hyposulphite of soda, the bromide of silver would not have been removed. This appearance is quite as marked in negatives developed with hydroquinone and amidol, as in those with pyrogallic acid, Consequently it does not arise from the tanning of the gelatine.

In the *Photographisches Archiv*, 1896, p. 10, I have drawn attention to the fact, that a dry plate upon which a metallic veil has been formed during development fixes very badly. It always contains a remnant of bromide of silver. Only when the red fog has been removed by means of bromide of copper can the elimination be completed with hyposulphite of soda. The fixation is therefore hindered in fogged plates by the thin film of silver. It is very probable that the appearance to which we now draw attention has the same cause, that is to say, that the silver reduced by light and the developer does not permit the hyposulphite of soda to force itself through. This explanation is supported by the fact, that at the juncture of a very dark with a light part of the negative the bromide of silver is removed in fixing for the breadth of about a millimetre round the dark part. Consequently the positive seen from the back of the plate is smaller than the negative. The hyposulphite of soda in those parts has not penetrated from above, but sideways. (See also, in comparison, the remarks on the lines noticeable at the margin of exposed and unexposed images.—*Photographisches Archiv*, 1895, p. 158.)

The observation that, under the circumstances referred to, bromide of silver may be left in a negative, is of itself of no great importance. It, nevertheless, increases our knowledge of the composition of the finished negative, and we must remember that it contains not only silver, gelatine, and oxidised products of the developer (see *Photographisches Archiv*, 1895, p. 174), but also unreduced silver salts. But much more important are the conclusions to be drawn therefrom for the physics of development.

If bromide of silver is left behind amongst the silver, the former cannot have been reduced by the developer, and the picture does not always extend from the surface to the glass. And especially is this the case in the highest lights, where it might be most expected.

It is therefore certain that the developer also has not penetrated to this depth in the high lights, and therein resembles the hyposulphite of soda. With a shorter exposure, on the contrary, it penetrates the entire film and reduces the bromide of silver through to the glass.

In this way a phenomenon can be accounted for, in explanation of which purely chemical causes have usually been accepted, viz., the solarisation of dry plates.

If part of a plate is very considerably over-exposed, the reduction is confined to the mere surface in that part. The film of metallic silver formed there is extremely thin, but it hinders completely the further penetration of the developer.

The reduction on the surface is too rapid at that part, but at the others, where the exposure is less, the reduction occurs more slowly, and meanwhile there is time for the developer to penetrate to the underlying portions. The latter consequently are stronger, and contain no bromide of silver.

The rapidity of reduction is the all-important thing. It is not necessary to assume, as I at first thought, that with longer exposure a coherent skin of silver, whilst, on the contrary, with shorter exposure, one richer in pores, is formed.

With over-exposed plates, a strong developer gives flatter pictures than a weak one. For this reason we find a very weak developer in a dipping bath so valuable in such cases. An addition of bromide of potassium slows development, and consequently gives denser images. But there is also the possible explanation, that the bromide of potassium renders the surface less amenable to development, and, by a consequent slower formation of the film of silver, permits a deeper penetration of the developer. The increase of the solarisation by an addition of hyposulphite of soda, thiosinamine, or much ammonia, is referable to the reverse process.

It is impossible to prove or to controvert this theory of solarisation, in the development of dry plates, by experiment, either by exposure through the back or by stripping the gelatine film from the glass before development. In the first case, the protecting film of silver is still formed on the surface through over-exposure, because the light has penetrated from back to front. The remaining bromide of silver is clearly visible from the back of the plate after fixation. If the film is stripped, the protecting layer is formed on both sides during development, and encloses the bromide of silver (or perhaps, more correctly, sub-bromide of silver).

If a negative is examined from the back during development, sometimes the image is invisible, but sometimes a negative, and at others a positive, can be seen. The image at the back is different with different kinds of plates. Gelatino-chloride plates give an image through the back much more quickly than the very rapid bromide plates. This difference depends partly upon the greater penetration of the active rays through the fine grain of the chloride than the coarse grain of the bromide.

But I will not enter further upon the causes of these differences, and will only describe what may be seen with one description of plate, a gelatino-bromide plate of ordinary sensitiveness. These observations, however, give very important support to my new theory of solarisation.

A normally exposed plate, after a certain time, shows a negative through the glass. (For shortness, I will use the expression, Negative penetration.) This negative grows more intense as development proceeds.

An under-exposed plate also shows negative penetration, especially if so much light has passed through that a blackening is perceptible from the glass side. Otherwise it remains uncoloured.

A much over-exposed plate, after prolonged development, shows strong positive penetration. Sometimes this positive is preceded by a negative, but this soon disappears as the back takes on a faint even colour. The positive then follows.

Of these separate points I will treat in a further article at a future time; but, in any case, the protective power of the quickly reduced film of silver can be deduced from these observations. R. E. Liesegang.

AN IMPROVED FLASHLIGHT.

The patentee, Mr. York Schwartz, observes:—

"Objects to be photographed are, as is known, oftentimes illuminated, *i.e.*, suddenly or momentarily lit up by aid of an easily inflammable and quickly combustible mixture that contains magnesium, aluminium, or an equivalent substance. This mixture is generally employed in the form of a conical heap, the free surface of which is very small in comparison to the volume of the material, and the intensity of the light emitted does not correspond to the quantity of the material used, especially as the light produced by the inner portion of the mixture is greatly absorbed or neutralised by the flame resulting from the combustion of the outer part. To obviate this drawback, the mixture has already been used not in the form of conical heaps, but in that of longish heaps or 'trains,' but then the generation of the light is distributed over or through a longer period of time, which again is very disadvantageous for the photographing of some kinds of objects.

"I now propose to mix the lighting material with an easily inflammable and quickly combustible cementing medium, for instance, with a solution of pyroxyline in ether and alcohol, and to bring this mixture into the shape of a foil of suitable size. After the foil has become dry, it may be hung up by means of a wire, and then lighted. The surface of the foil is considerable in proportion to its volume, and there is practically no absorption of light during the combustion. The materal burns with a very great quickness, and the full intensity of the light is at once attained. I am therefore enabled to use less material than has heretofore been required in order to obtain a certain definite volume of light.

"Instead of mixing the lighting material directly with a solution of the cementing medium, I may mix it first with the dry cementing medium, and then add the dissolvent for the latter to that mixture, or I may form foils of the cementing medium, and enclose a layer of the lighting material between two of said foils, or provide one such foil on either side with a layer of said lighting material. In fact, a great many variations may take place with regard to the manner of combining the lighting material with the cementing medium, and I wish to be understood that I do strictly confine myself to the examples mentioned.

"Other advantages afforded by my novel method reside in the facilitation of, first, the handling of the material; and, second, the proportioning or adjusting of the quantity that is requisite or sufficient for one photographic or like operation, and I wish it further to be understood that I do not confine myself to employing my novel method solely for such lighting materials as are used for photographing purposes,

as the same is equally applicable for pyrotechnic purposes, such, for instance, as in production of the so-called Bengal lights, especially where the latter are employed for signalling purposes.

"The size and shape of the lighting foils may greatly vary, and is, as a matter of course, dependent on the volume of light required and the purpose for which the light is to be used."

Mr. Schwartz claims: 1. As a new article of manufacture, a foil consisting of an easily inflammable and quickly combustible lighting material, and of a cementing medium for creating cohesion between the particles of the same. 2. In a combustible composition for illuminating purposes, the combination with an easily inflammable and quickly combustible lighting material, of a cementing medium for the particles of the same, said composition being made up into a form or forms most suitable for rapid combustion.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

Leeds Meeting, July 13–18.

The following is the programme of the week's arrangements:—

Monday, July 13.

Opening of the Convention. Reception by the Mayor, the Right Hon. W. L. Jackson, M.P., in the City Art Gallery, at 7.30, followed by the Presidential address and exhibition of lantern slides, illustrating the Shrewsbury Convention and Bolton Abbey and Woods (Tuesday's excursion).

Tuesday, July 14.

Bolton Abbey and Woods. By train from Midland Station at 9.27. Returning from Bolton Abbey Station at 5.39. Carriages from Bolton Abbey Station to Abbey and Strid. Tickets, including luncheon, 5*s.* 6*d.* each. Luncheon at the Devonshire Arms, Bolton Bridge (¾-mile from the Abbey) at four o'clock.

Route A.—Leader, Dr. Thos. Thresh. Leaving Bolton Abbey Station by conveyance, the Abbey will be reached by a drive of a mile and a half. Bolton Abbey was founded about 1120, for monks of the Order of St. Augustine, and is beautifully situated on the south side of the River Wharfe. Near the Abbey is Bolton Hall, one of the seats of the Duke of Devonshire. From the Abbey, members will work up the south side of the river to the Strid, and on the return cross the wooden bridge and work up and down the stream on the north bank to the stepping-stones, and there cross to the Abbey. The Strid is two miles from the Abbey.

Route B.—Leader, Mr. J. H. Walker. By carriage from the Station to the Abbey, and at once cross the stepping-stones and work down and up the north side of the river to the wooden bridge, which cross to south bank of the river and go up to the Strid, then return along the south side of river to the Abbey. The Strid is two miles from the Abbey.

Route C.—Leader, Mr. Godfrey Bingley. By carriage from station to the Strid. After photographing about the Strid, cross the wooden bridge and work up and down the river on the north bank, and cross to the Abbey by the stepping-stones. About two miles.

The Strid is a narrowing of the rocks where the Wharfe rushes through a confined space. *As there have been numerous fatal and serious accidents to persons attempting to jump over the stream at this point, it is hoped no members will make the attempt, as the distance across is very deceptive. In all cases, members wishing to cross the river must retrace their steps to the wooden bridge.*

Papers:—At the Philosophical Hall at 8.30 p.m. *Fixing and Washing of Paper Prints*—A. Haddon; lantern slides illustrating excursions to Kirkstall and York, and former Conventions.

Wednesday, July 15.

General meeting in the Philosophical Hall at 10 a.m. Meeting of General Committee in the Philosophical Hall at 11 a.m., after which visit Yorkshire College (trams pass Philosophical Hall every five minutes. Fare to College-road, 1*d.*). The Convention Group will be taken at the College about noon.

Afternoon excursion to Kirkstall Abbey. Leader, Mr. Washington Teasdale. Trams to near the Abbey pass the Queen's Hotel every ten minutes. Fare, 3*d.* Kirkstall Abbey is situated on the left bank of the River Aire, about three miles from Leeds. The Abbey (Cistercian) was founded by Henry de Lacy in the year 1152. In 1889 the Abbey and adjoining grounds were purchased by Colonel J. T. North, and presented by him to the city of Leeds. At that time the Abbey was very picturesque, many of the walls being covered with ivy, and numerous trees were growing about the ruins. Unfortunately, for the preservation of the ruins, the Corporation found it necessary to remove the ivy from the walls and cut down the trees, so that now the Abbey has lost much of its former beauty.

Annual dinner and smoking concert at Queen's Hotel, 7 p.m. Tickets, 5*s.* each.

Thursday, July 16.

Excursion to York. The following gentlemen of York have kindly promised to lead the different sections: Dr. Tempest Anderson, Mr. John Saville, Mr. H. M. Platnauer, Mr. Geo. C. Dennis, Mr. Watson Hirst. By train from New Station, North Eastern Railway, at 9.5 a.m. Returning from York at 6.20. Tickets, including luncheon, 5*s.* each. Luncheon (hot or cold) at the Royal Station Hotel, 1 to 3 o'clock; and first-class refreshment room (station platform), express luncheon, 1.30 to 3 o'clock. The city of York affords a fine field for the photographer, especially if at all interested in architectural work. In addition to the noble Minster, there are numerous old churches possessing features of interest: the city walls, with the four gates or bars, of Micklegate (1300), Bootham, Walmgate (1648), and Monkgate; Clifford's Tower; the Guildhall, which is best photographed from the Lendal Bridge; and numerous old shops and houses in Fossgate, Petergate, Stonegate; the old buildings in the Shambles being particularly interesting. Near the east end of the Minster is St. William's College, now converted into dwelling-houses, but still well worth a visit. In the grounds of the Yorkshire Philosophical Society (entrance near Lendal Bridge) are to be found the Natural History and Roman Museums, the ruins of St. Mary's Abbey (Benedictine), St. Leonard's Hospital, the Multangular Tower (Roman), &c. The Council of the above Society has generously thrown the grounds open free to members of the Convention, and will also allow the use of the dark room in the Museum for changing plates. The old Manor House, or Palace of James the First (now the Wilberforce School for the Blind) is interesting alike to the photographer and antiquarian. Permission has been given for members to photograph in any part of the palace, Note: Orders for photographing in the interior of the minster may be obtained from the local Hon. Secretary. Mr. Godfrey Bingley. Members wishing to photograph in the choir, ladye chapel, or chapter house, must pay the verger the usual charge of 6*d.*, all other parts of the minster being free. Dark rooms for changing plates (small charge): Mark Midgely, Stonegate; Baurley & Co., Minster Gates; J. Marshall Smith, 15, High-Ousegate; A. Yardley, 99, Nunney-lane.

Helmsley, for Rievaulx Abbey. No special excursion arranged. Trains—Leeds: 7.25, arrive Helmsley, 9.41; 9.5, arrive Helmsley, 11.50. Return—Helmsley: 5.54, arrive Leeds, 9.7; 8.0, arrive Leeds, 10.22. Return fare, 7*s.* 3*d.* Helmsley Castle of no particular interest. There is an old-timbered house in the market-place. Rievaulx Abbey is about three miles from Helmsley, carriages may be hired at the latter place if desired. Tickets for "the Terrace" and Abbey, 1*s.* each.

Papers:—At the Philosophical Hall at 8.30 p.m. *Orthochromatic Photography*—C. H. Bothamley; exhibition of lantern slides, illustrating excursion to Ripon and Fountains Abbey, and former Conventions.

Friday, July 17.

Excursions to Ripon, Studley Royal, and Fountains Abbey. Leaders, Mr. Thos. S. Mason, Fountains Hall; F. W. Bedford, A.R.I.B.A.; Herbert Denison; Godfrey Bingley. By train from New Station, North Eastern Railway, at 7.50 (arriving at Ripon at 9.1). Returning from Ripon at 6.20 (twenty-five minutes should be allowed for walking from hotel to station after lunch). Conveyances from station to Fountains Abbey and back (two miles), also from the Minster, about noon for Fountains and back. All conveyances will return from Fountains about 3.45. Tickets, including luncheon, 6*s.* 6*d.* each. Luncheon at the Unicorn Hotel, Ripon, at 4.20. Light refreshments can be obtained on payment at the "Canal Gates," Studley. Permission has been granted for members to photograph the Minster any time except during the services, which commence at 12.15 and 5.15. Those desiring to photograph the Minster had better do so on their arrival at Ripon, and then proceed to Fountains a little before noon. The only point of interest in Ripon is the Minster, the best view of which is obtained from the south, near a foot-bridge crossing the River Skel, about ten minutes' walk from the station. Formerly the cathedral had three spires: in 1660 one of these fell, and, four years afterwards, the remaining two, being considered unsafe, were taken down. Dark rooms at Ripon for changing plates: Mr. H. B. Rudd, chemist, 29, Westgate; Mr. C. Watson, photographic artist, Kirkgate. The grounds at Studley Royal, the seat of the Marquis of Ripon, present many beautiful features. The distance from the "Canal Gate" (the point to which carriages are allowed to drive) to the Abbey by the upper route is one mile, and by the lower road about a quarter of a mile less. Fountains Abbey (Cistercian) is said to be one of the finest and most perfect monastic houses in England. Near the Abbey is the old mansion of Fountains Hall, which will afford several pleasing photographs. By the kind permission of Thos. S. Mason, Esq., members may change plates in a small dark room which will be found in the yard at Fountains Hall, and also in one of the rooms of the Abbey. Permission has been given to photograph the interior of Studley Church, which will be seen on the right before entering the "Canal Gates." The church is modern, but the interior is very fine.

Papers:—At the Philosophical Hall at 8.30 p.m. *Photography at the Seaside*—F. M. Sutcliffe; exhibition of lantern slides—Knaresbro', &c., and former Conventions. Council Meeting.

During the week there will also be probably demonstrations of *Photogravure, Colour Photography by the three-colour method, Novelties connected with the Röntgen Rays.*

Saturday, July 18.

Excursion to Knaresbro'. Leaders, Rev. W. E. Hancock; Mr. J. W. Addyman. By train from New Station, North Eastern Railway, at 8.30,

arriving at 9.35; 10.2, arriving at 11.25. Return trains from Knaresbro' at 5.47, 6.17, and 6.50 p.m. Tickets, including luncheon, 4*s.* 7*d.* each' Tickets for this excursion are available for return from Knaresbro' or Harrogate until the following Monday. Luncheon at the Elephant and Castle at 2 p.m. Dark room (small charge) at C. B. Southwell's, High-street. Various sizes of Ilford plates stocked. The town of Knaresbro' is very picturesquely situated on the banks of the river Nidd, and is about three miles from the well-known health resort of Harrogate. Good views of the town and Castle can be obtained from each side of the river, especially from the Long Walk on the south bank of the stream. The chief places of interest in addition to the views up and down the river are: the Castle, Dropping Well, St. Robert's Chapel, Fort Montague, and Rock House; and, about half a mile from the lower bridge, St. Robert's Cave and Grimbold Crag. A small charge is made for admission to the Dropping Well, St. Robert's Chapel and Cave. Plumpton Rocks are about two miles from Grimbold Bridge and four from Harrogate, and several places of interest may be reached by a short railway journey from Harrogate.

Places of Interest.

Leeds. There is not much of photographic interest in the city of Leeds. Although there are numerous good buildings in the city, probably the Town Hall is the only one that will have any attraction for members of the Convention.

Kirkstall Abbey is about three miles from the centre of the city, and may be reached by tram or rail. (See Wednesday's excursion.)

Adel Church. About five miles from the city, and two miles from the Headingley train terminus (fare 3*d.*), is a small but very interesting old church dating from the twelfth century. The old Norman porch is considered by archæologists to be the finest in the country. There is also a fine Norman arch across the nave.

Roundhay Park, three and a half miles from Leeds, may be reached by tram (changing at Sheepscar into the electric tram) or by wagonette from Briggate. This Park is beautifully situated, is very extensive, but contains only a few features of interest for the photographer.

The Yorkshire College is situated in College-road, Woodhouse-lane, and was built from designs prepared by Mr. Alfred Waterhouse. Permission has been given for members to look over the College, and it will be visited after the morning meeting on Wednesday. Trams on the Headingley line pass Queen's Hotel and Philosophical Hall every five minutes. Fare 1*d.*

General Information.

Application for membership should be made through the Hon. Secretary, or through the Local Hon. Secretary. The subscription is 5*s.* per annum, and is due on January 1 in each year, and carries with it admission to all the meetings and to the Exhibition throughout the week, and liberty to purchase tickets for the excursions.

An Exhibition of Photographs and Photographic Apparatus will be held in the Philosophical Hall from July 13 to 18, between the hours of nine a.m. and nine p.m. Members must produce their badges on entering. The public will be admitted on payment. Tickets, 6*d.* each.

A special and attractive feature of this year's Exhibition will be a large collection of modern Pictorial Photographs (kindly got together and arranged by the President, Mr. H. P. Robinson), comprising pictures by the leading exhibitors of recent years, showing the great advances made, both in portraiture as well as in landscape work, up to the present date by photography.

The Annual Meeting will be held at the rooms of the Leeds Philosophical Society on Wednesday, Jnly 15, at ten a.m.

The Queen's Hotel (Midland Station) will be the Convention headquarters during the meeting.

Group.—The Group will be taken, weather permitting, at the Yorkshire College, on Wednesday, July 15, about noon, by Mr. Donald McIver, of 8, Bond-street, Leeds. Price, in silver or platinotype, mounted, 15 × 12, 5*s.*, or 12 × 10, 4*s.* each.

Dinner and Smoking Concert.—The Dinner will be held at the Queen's Hotel (headquarters), on Wednesday, July 15, at seven p.m., to be followed by a Smoking Concert. Tickets. 5*s.* each, to be obtained of the Hon. Secretaries. Evening dress optional. Ladies will be welcome at the Dinner and Concert.

Members on arrival are requested to enter their names, full addresses, and where staying in Leeds in the signature book in the rooms of the Leed Philosophical Society.

The Mechanics' Institute and Literary Society, Cookridge-street, a few minutes' walk from headquarters. The Directors of this Institution have kindly given permission for visiting members to have free use of the Reading-room during the Convention week.

Dark Rooms.—Queen's Hotel, headquarters (for changing only); Philosophical Hall (for changing only); Messrs. Reynolds & Branson, Commercial-street; Messrs. Pearson & Denham, 5, New Station-street; Mr. C. C. Vevers, Market-street, Briggate; Messrs. R. H. White & Co., 18, Park-row (changing free, small charge for developing).

Hotels and Tariffs.

Queen's Hotel (Headquarters. Midland Railway).—Private dining-room, private smoking-room. Bedroom, light, and attendance, from 4*s.* Table-d'hôte breakfast, 2*s.* 6*d.* Table-d'hôte lunch, 3*s.* Table-d'hôte dinner, 5*s.* Meat tea, 2*s.* 6*d.*

Dinner and Smoking Concert to be held at Queen's Hotel.

Great Northern Railway Station Hotel.—Private Smoking-room. Bedroom, attendance, and breakfast, 6*s.* 6*d.* Luncheons, 2*s.* 6*d.* and 3*s.* Dinners, 4*s.* 6*d.* Daily terms, inclusive, 10*s.* 6*d.*

Griffin Hotel (Boar-lane).—Bed, attendance, and breakfast, 5*s.* 6*d.* Table-d'hôte luncheon, 2*s.* Dinners, from 3*s.* 6*d.* Meat tea, 2*s.*

Victoria Hotel (Great Georges-street, back of Town Hall).—Bed, attendance, and breakfast, 4*s.* 6*d.* Dinners, 2*s.* 6*d.* Meat teas, 2*s.*

Trevelyan Temperance Hotel (Briggate end of Boar-lane).—Bed, attendance, and breakfast, 5*s.* Luncheons, 2*s.* Dinners, 2*s.* 6*d.* Meat teas, 2*s.*

Note.—No discount from any of the above terms.

THE PHOTOGRAPHIC SALON, 1896.

The Photographic Salon, 1896 (fourth year), will be held at the Dudley Gallery (Egyptian Hall), Piccadilly, London, W., from September 24 to November 7, 1896.

The aim of the Committee is to exhibit only that class of work in pictorial photography in which there is distinct evidence of personal artistic feeling and execution.

Careful consideration will be given to all pictures entered for exhibition, and a selection of works of pictorial merit made by the Committee. Pictures which have already been publicly exhibited in London will not be accepted. Pictures sent for exhibition to any other Exhibition open in London at the same period are liable also to be disqualified. No awards are offered, and no charge made to exhibitors. Exhibitors will be entitled to a season ticket. Arrangements will be made for the sale of pictures, if desired, and a commission of fifteen per cent. will be charged on sales effected.

The following are the conditions of entry, &c.:—

1. Each picture must be separately framed, and each frame must bear on the back name of exhibitor, number and title of picture, and price, if offered for sale, corresponding to the particulars on the entry form.

2. Pictures will be received at the Dudley Gallery *only* on Monday, September 14, from ten a.m. to six p.m.

3. They must be delivered carriage paid, accompanied by their entry form, and without packing or wrappers of any kind, either personally or through an agent.

4. The well-known packers and exhibition agents, Messrs. Dickses & Co., of 7, Ryder-street, St. James's, S.W., will undertake to receive, deliver, and return exhibits on the following terms, viz., they will collect (or receive and unpack) and deliver at the Gallery; also, if rejected, and at the close of the Exhibition, will remove from the Gallery and redeliver in London (or repack), for the sum of one shilling each for pictures up to three feet long outside the frame, and one shilling and sixpence each above that length. All frames remaining in their warehouse after the close of the Exhibition without instructions from the owners will be charged at the rate of threepence per week.

5. Pictures which are not accepted must be removed from the Gallery on Monday, September 21, between the hours of ten a.m. and six p.m. If not so removed they will be warehoused at Messrs. Dickses's at the risk and expense of owners.

6. At the close of the Exhibition, all exhibits must be removed on Monday, November 9, between the hours of ten a.m. and six p.m. If not removed, they will be warehoused as stated in Clause 6.

7. Correspondence relating to the forwarding or return of exhibits should not in any case be addressed to the Secretary. The Committee accept no responsibility except while the pictures are actually in their charge at the Gallery.

8. An insurance is effected on the pictures hung for exhibition.

NOTES FROM THE WEST OF SCOTLAND.

The event of the week has been the opening of the Corporation Exhibition at Camphill House on the 3rd inst.

The Parks and Galleries Committee issued invitations to a goodly number of citizens, as well as professional and amateur photographers in Glasgow, among those who came from a distance, and who were favoured with invitations, being Mr. Crookes, of Edinburgh, and Mr. Charles Reid, of Wishaw.

Of local workers there was a very large turn out. The company assembled in City Chambers prior to driving over to the Exhibition, and among those present we noticed the following well-known workers:—Provost Stuart, Messrs. Mason, Annan, Ralston, Lang, Morison, Oliver, Armstrong, Watson, Warneuke, Goodwin, Laing, Lindsay, Miller, Duncan, Todd, and about a hundred others.

Baillie Shearer, in opening the Exhibition, stated that it gave the Parks and Galleries Trust great pleasure to see so many present interested in photography, and heartily thanked those gentlemen who had rendered such valuable assistance in gathering together such a fine collection of work as they saw around them.

To say that from every standpoint the Exhibition is unique does not overstate its value, and probably no other Exhibition ever held in Glasgow, or in the United Kingdom for that matter, could be compared with it from an historical or educational standpoint.

In number one room alone the entire history and progress of photography, from its inception by Daguerre down to the latest phase of photo-mechanical work, is shown, and any student of photography who carefully studies the exhibits in this room alone will learn much indeed.

Mr. Paton, the Curator of the Corporation Galleries, accompanied those present at the opening ceremony, and briefly described the various works of interest shown.

An excellent catalogue has been published, and the Exhibition will be open free to the public for the next three months.

The recently formed Professional Photographic Society of Glasgow has made a good and practical start. One of the abuses to which professional workers were subjected was an exorbitant charge by the Corporation for water. The action of this new Society has succeeded in getting these charges very much reduced. We understand the Council have in view the dealing with other items of economy which affect the trade generally.

THE W. H. HARRISON FUND APPEAL.

	£	s.	d.
Acknowledged last week	67	0	0
Right Hon. Lord Grimthorpe, LL.D.	2	2	0
Right Hon. Sir Edward Fry, D.C.L.; F.R.S. ...	1	0	0
R. H.	2	2	0
Members of the Manchester Photographic Society	2	5	6
C. C. Massey, Esq.	5	0	0
X. Y. Z....		5	0
	£79	14	6

Allow me to appeal to the members of the local societies and clubs, and to ask that they may follow the excellent example of the Brixton and Clapham Photographic Club, and the Manchester Photographic Society, by making a collection from among the members and forward them through the Hon. Secs. to

FREDK. H. VARLEY, 82, *Newington Green-road, London, N.*

The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

REPRODUCING NEGATIVES.—J. HASTIE writes: "I should like to practise carbon printing by single transfer; but, rather than strip my negatives, I would reproduce them in reverse if there were any cheap and simple method available. Glass plates are too expensive for the job, and somewhat uncertain; but, if the quality of image is sufficiently good, I see no reason why paper negatives should not be made both cheaply and with certainty. Will any reader who has experience in this direction advise me as to the probable feasibility of the plan and the best sort of paper to use?"

"CHESSBOARD" SCREENS.—"I have read lately of 'chessboard screens for half-tone work; these, I presume, are screens in which the pattern consists of lines of alternate black and white squares placed side by side or alternate lines of black and white squares placed diagonally. Are such obtainable commercially, or how are they produced? They can scarcely be ruled in the ordinary way.—BETA." A patent has been recently taken out for such screens, but we have, so far, no details as to mode of production, nor can we say whether they are on the market.

METHYLATED SPIRIT.—J. G. E. asks: "How can I tell the difference between ordinary (mineralised) methylated spirit and 'finish?' Formerly, before the introduction of the mineral naphtha, it sufficed to pour a little of the spirit to be tested into a glass of water, when 'finish' produced a cloudy precipitate and the pure spirit remained clear or nearly so. Now either produces cloudiness with water. I have obtained a sample for burning which behaves so badly, clogging the wick-holder and refusing to burn after a very few minutes, that I am convinced it contains gum, though the dealer who supplies it says it is 'burning spirit.' How can I decide?"—We should say you would have very little difficulty in deciding by pouring a little on to a piece of *cold* glass, when on evaporation the gums would "chill" and form a surface like ground glass. If some of the spirit were evaporated in a small basin or saucer, so as to concentrate the solution of gum, and then allowed to get cold, the effect would be more pronounced.

CLEANING OLD NEGATIVE GLASS.—W. HOWARD wants to know "the best" way to clean off old negatives films. He says: "I have a large number of spoilt plates which I might use up in a variety of ways if they were clean, but I find it takes me half an hour or so to get the old film off a single one, and then it is by no means *clean*. Which is the best and quickest way to proceed? I am sure many others besides myself would be glad of some ready method of utilising old negatives."—Perhaps some of our readers can name "the best way;" we "give it up."

SCREEN KINETOSCOPY IN 1888.—Mr. A. L. HENDERSON asks: "Will you please inform me who was the exhibitor of the moving photographs on the screen that were exhibited at the last International Brussels Exhibition, about the year 1888? I have not seen any results equal to them."—Perhaps some of our readers can give Mr. Henderson the information he seeks.

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—Photo-mechanical Meeting, Tuesday, June 16, at eight p.m., at 12, Hanover-square. *Collodio-bromide and Transparencies for Photogravure*, by Mr. E. Sanger Shepherd.

SINCE his return to England, Mr. Whistler has devoted much of his time to a new series of lithographs of London and district, one of which—a view of the Thames looking towards Westminster—will be among the supplements to the first part of the new volume of the *Studio*, due about the middle of June.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, June 17. Mr. W. D. Welford will introduce a discussion upon the subject of *Art and Science as an Educational Factor in the Advancement and Progress of Photography.*

X RAYS IN PIRACY.—The pitiless pirate scanned the distant horizon with one of his eagle eyes. "Ha!" It was a short word, but there must have been a motive for it. "A sail! a sail!" Turning to his first mate, he commanded him, with a fearful oath, to run up the regulation flag. That person replied that there wasn't one, as the only flag they ever had was shot away in the last affair. Was the pirate chief rattled? Nay! For the bold buccaneer to rush down into his cabin, bring up his Röntgen camera, and, by means of the X rays, to take an instantaneous photograph of the mate's skull and of a couple of cross bones from his twisted leg was but the work of a moment, and in a wink the sable pennant was flying from the foretopsail of the saucy *Plankwalker*. From that instant, as is usual in such cases, all was excitement.—*Detroit Free Press.*

A DOG'S VANITY.—The Hôtel Vendome, in San José, is the home of a pretty Skye terrier named Nellie. She attracts a great deal of attention from the guests. Cameras are plentiful among them, and nearly everybody who owns one wants a picture of Nellie. Those before whom she has posed have been in the habit of giving her something to eat, and at present Nellie does not want anything better than to have her picture taken. If she sees anybody walking along the streets with a camera, she will run in front of them and stand on her hind feet, making every effort to look her prettiest. If her request is complied with, she has several "poses" that she will gladly take in succession for the purpose of having them "snapped." She knows when the exposure has been made, and always jumps around as soon as she hears the shutter click. Nellie's picture can be seen in nearly every large city in the Union.—*Westminster Gazette.*

RÖNTGEN RAYS DEMONSTRATION AT SOUTHWOLD.—On Whit Monday evening a very successful experimental demonstration was given in the Town Hall, Southwold, by Mr. J. Godfrey Martyn, M.R.P.S., before a large and appreciative audience. The apparatus employed was that which Mr. Martyn had lately been using at the Crystal Palace, and with it the hands of four individuals (two each of ladies and gentlemen) were admirably rendered, with shot embedded in two instances. The results were shown at the meeting, besides a goodly series of animal structures and miscellaneous objects, previously taken by the lecturer and thrown upon the screen. The latest form of radiant tube was employed with a powerful Rühmkorff coil, but other earlier forms of Crookes' and Giessler tubes were also shown in action, besides the new Jackson fluorescent screen, which revealed the contents of several boxes and parcels placed in the path of the X rays. The Town Clerk moved a vote of thanks to the lecturer, which was carried by acclamation.

A WARNING TO PHOTOGRAPHERS.—On Tuesday, June 2, at the Alton (Hants) Petty Sessions, with Mr. J. G. Wood in the chair, a man named Vipond was sent for trial at Winchester Assizes on the charge of stealing a camera and slides, with the usual appliances, and also a Gladstone bag, the property of Mr. A. W. Holliday, photographer, 9, Market-street, Alton. From the evidence it was gathered that, a few weeks ago, Mr. Holliday was called

upon by Vipond, who solicited work, and he was given some to do, and kept on for nearly a fortnight. He was then sent out with the apparatus to take views, but; instead of taking views, he proceeded to Portsmouth, pawned part of his employer's property for 25s., sold the rest to private individuals, and eventually found himself in the hands of Police Serjeant Wakford, who, at any rate, has proved himself far from a sleepy individual in tracking thieves. Of course, such practice is put a stop to for a little time, at least, and we congratulate Mr. Holliday on the recovery of his property, and warn all such business men to be careful whom they employ before entrusting them with their valuables. The annoyance and unpleasantness attached to such cases are not the least things to be thought of.

BRISTOL INTERNATIONAL TRIENNIAL PHOTOGRAPHIC EXHIBITION.—The Council of the Bristol and West of England Amateur Photographic Association begs to announce that the Triennial International Exhibition of Photographs, Apparatus, Appliances, and Processes, will be held in the galleries of the Academy of Arts, Queen's-road, Clifton, Bristol. To be opened on Monday, December 14, 1896, continuing open till Saturday, January 23, 1897. Apart from photographs for competition, the Council will esteem it a favour if those who have any interesting examples of the history and progress of photography will kindly lend them for exhibition. The following is a list of medals which will be awarded by a Committee of five Judges—four being well-known photographers, and one an eminent painter, three of the Judges not being members of the Association:—A gold medal for the picture or series of pictures having already received an award at any previous exhibition, and which, in the opinion of the Judges, possesses the highest degree of merit, irrespective of size or subject. 1. Two silver and two bronze medals for landscape or seascape, of not less than $6\frac{1}{2} \times 4\frac{3}{4}$ size. 2. Two silver and two bronze medals for marine subjects of not less than $6\frac{1}{2} \times 4\frac{3}{4}$ size. 3. One silver and one bronze medal for set of not less than six landscapes or seascapes of 5×4 or under. 4. One silver and one bronze medal for architectural subjects. 5. One silver and one bronze medal for portrait or series of portraits of $8\frac{1}{2} \times 6\frac{1}{2}$ or under, taken direct. 6. One silver and one bronze medal for portrait or series of portraits above $8\frac{1}{2} \times 6\frac{1}{2}$, taken direct. 7. One silver and one bronze medal for *genre* pictures. 8. One silver medal for the best picture or series of pictures of any subject taken by artificial light. 9. One silver and one bronze medal for enlargements of any subject and by any process, provided both the original negative and enlargement be entirely the work of the exhibitor. An unframed mounted print from the original negative to accompany each exhibit. 10. A silver medal for the best transparency or series of transparencies (stereoscopic or otherwise), not being lantern slides. 11. One silver and one bronze medal for sets of twelve lantern slides, by any process other than mechanical. Table frames will be provided. 12. One silver medal for botanical or zoological subjects, micrographical, astronomical, or other scientific branches of photography. 13. Two silver medals for heliochrome and other process work. Only ordinary photographic retouching will be permitted on the negatives. The Judges will have the power of requiring the negatives of any picture receiving an award in this class to be produced for inspection. 14. One silver and one bronze medal, to be awarded according to the discretion of the Judges, for improved apparatus, materials, processes, or for any other meritorious productions.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
15	North Middlesex	*Silver Printing and Toning.* W. J. Simpson.
15	South London	Social Evening.
16	Ashton-under-Lyne	Excursion: Wilmslow and Alderley. Leader, Charles Wilson.
16	Birmingham Photo. Society	Excursion: Compton Winyates. Leader, W. Jones.
16	Brixton and Clapham	Ordinary Meeting.
16	Gospel Oak	Character Studies by Flashlight.
16	Hackney	*Printing with Silver Paper.* E. J. Wall.
16	Royal Photographic Society	*Collodio-bromide and Transparencies for Photogravure.* E. Sanger Shepherd.
17	Borough Polytechnic	*Contact Printing and Enlarging on Bromide.* A. Humphreys.
17	Croydon Camera Club	*Hand camera Work.* W. Thomas.
17	Photographic Club	*Art and Science as an Educational Factor in the Advancement and Progress of Photography.* W. D. Welford.
20	Aintree and District	Excursion: Llangollen.
20	Borough Polytechnic	Excursion: Oxted.
20	Hackney	Excursion: East Moulsey.
20	Leytonstone	Special Sale and Exchange Night.
20	Liverpool Amateur	Excursion: Overton and Erbistock.
20	Oldham	Excursion: Chew Valley. Leader, J. W. Cooper.
20	South London	Excursion: Leatherhead. Leader, G. A. Mault.
20	Wolverhampton	Excursion: Warwick.

ROYAL PHOTOGRAPHIC SOCIETY.

JUNE 9.—Ordinary Meeting,—Captain W. de W. Abney, C.B., D.C.L., F.R.S. (President), in the chair.

The HON. SECRETARY announced that the following had been elected as the Hanging Committee at the forthcoming Exhibition, viz., Messrs. Cembrano, Hodges, Mackie, Mummery, Sinclair, and W. Thomas; and also that the Hanging Committee, the Judges, and Messrs. Wall, Wellington, and England would constitute the Selecting Committee.

At the conclusion of the ordinary routine business, the chair was temporarily taken by Sir Henry Trueman Wood, M.A., and the PRESIDENT read a paper on

PRINTING DENSITY IN NEGATIVES.

Premising that he had still many points under consideration and in process of discussion by means of experiments, and assuming that his method of measuring the opacity of photographic plates was sufficient, he took as his starting point a negative with every grade of transparency from perfect transparency to an opacity allowing one two-hundredth of the incident light to pass through it, and possessing every shade of gradation between these extremes, the problem to be solved being how much of that range was useful for printing purposes and how much was useless. Such a negative as that indicated, however, would be an intolerable nuisance to work with or to measure, and he had therefore adopted for his experiments a new form of the Warnerke sensitometer, of which he spoke in highly eulogistic terms. He had found that for platinotype printing it was useless to have a negative more opaque in any part than would allow the passage of $\frac{1}{75}$ of the light passing through the least opaque part, though by alteration of the sensitive salt and by development this proportion might be slightly varied. For printing with printing-out papers, his measurements indicated that a negative should only be so opaque in its densest part that $\frac{1}{125}$ of the light passing through the transparent part should be transmitted by the former, all further opacity, though visible to the eye, being useless for printing purposes. It thus appeared that for measurement the negative for printing with P.O.P. might have half as much again of opacity as it should have with platinum papers. The blackness of P.O.P. was considerably greater than that of platinum, the measurements showing that the greatest density of the former only reflected about one per cent. of white light, whereas platinum paper reflected about five per cent. Turning to the physiological effects produced by greys of different degrees of darkness or lightness, Captain Abney referred to a large series of observations which he had made during the past ten years. Taking a series of grey squares, varying between black and white, he found that, if a person were asked to pick out the particular tint which appeared to him to be intermediate between the two extremes, he would not select the grey reflecting the mean of the white reflected from both, but one considerably darker, this peculiarity continuing when similar selections were made from divisions and subdivisions of the original series. Applying this fact to photographic prints, a negative which by measurement might appear perfectly satisfactory might yet give a print which failed to please the eye. He showed strips painted by eminent artists to illustrate their ideas as to the mean of a series of grey tints, and pointed out wherein they differed from the theoretical shades ascertained by measurement.

Mr. WARNERKE suggested that paper ruled with black lines with different spaces would have been more useful for Captain Abney's purpose than the squares of various tints painted by artists, as there might then be a perfect numerical relation between the black and white.

Mr. W. E. DEBENHAM referred to the reversal of the image in platinotype printing, and showed a print in which this had occurred in the deep shadows; he attributed it to the fact that, in quick printing, the products of chemical decomposition by light could not get away. He thought that the visual selection of greys would very much depend upon the strength of the light in which the tints were examined.

CAPTAIN ABNEY, in reply to Mr. Warnerke, said that a paper was read at the Royal Society, many years ago, in which the use of black and white lines was suggested, and Sir George Stokes pointed out that the physiological effect of the lines need not be the same under all circumstances; he therefore thought it better to employ a graduated scale of greys, of which the whiteness could be accurately measured. He confirmed Mr. Debenham's remarks as to the reversal of the platinotype image, and as to its cause, and also as to the visual mean of greyness varying according to the light in which the selection was made.

A vote of thanks was passed to the President for his communication.

Mr. C. F. CROSS then read a paper by himself and his partners, Messrs. E. J. Bevan & C. Beadle, on the subject of

CELLULOSE AND ITS DERIVATIVES.

In reply to the question, What has cellulose to do with photography? the authors expressed the opinion that the science of photography was intimately bound up with coming developments of the greatest moment, that it was important that its basis should be broadened as much as possible, and that cellulose was destined to play a considerable part in the advance of the science. Particular attention was directed to the various forms in which cellulose could be obtained in solution, there being certain compounds of the metals which in aqueous solution readily dissolved it, viz., zinc chloride, zinc chloride dissolved in hydrochloric acid, or solutions of cuprammonium. Photographers might make an interesting demonstration by putting a platinum print face downwards upon a resistent surface, such as glass, porcelain, or asbestos, and pouring over it a solution of zinc chloride in hydrochloric acid, when the paper would be dissolved, leaving the platinum image upon the support. The paper described very fully several compounds of cellulose, and a number of different varieties were exhibited, and examined by the audience with much interest, the new "artificial silk," or "lustra-cellulose," receiving special attention.

After some remarks by Messrs. J. W. Swan, J. Spiller, T. Bolas, and S. Davies, a vote of thanks was accorded to the authors of the paper, and the meeting concluded.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 4.—Mr. H. C. Rapson in the chair.

Mr. Edward Simpson was elected a member.

Mr. A. L. Henderson showed a device to be attached to the camera front for facilitating the changing of lenses. The arrangement consisted of a circular plate of aluminium revolving in a flange and carrying on its face three separate pairs of lenses for stereoscopic work, any pair being brought into action by partially revolving the disc. Any one of the six lenses could be used by

means of a second plate at the back of the first, which could be so adjusted as to close the second opening, the device also allowing of the lens chosen being placed at the top, bottom, or either side of the camera front.

Mr. Freshwater showed an aluminium plate of graduated thickness, used for measuring the relative speeds of tubes for X-ray photography, made by Reynolds & Branson of Leeds, and a photograph taken by its means.

The Hon. Secretary considered that, unless all the conditions were constant, which was rather unlikely, the instrument was not of much utility.

The Hon. Secretary read a paper on

The Measuring of Stops.

Some years ago the Photographic Society of Great Britain established a system known as the Universal Standard, taking as basis the intensity of a portrait lens, the aperture of which is one-fourth of the focus, usually expressed as *f*-4. Of the Universal Standard this is No. 1, and it was proposed that others of a series should be fractional of this, so that each successive stop should necessitate twice the exposure of that preceding it. These stops are numbered 1, 2, 4, 8, 16, 32, &c., representing multiples of the exposure given with No. 1. This standard might have become universal on account of its convenience, but for one error. Objections have been raised to it on the Continent, and he thought, on the most important point of aperture, the English system wrong. Attention has been called to this lately by the improvements made possible by the new Jena glass. The system of stops adopted by German opticians is based upon the ratio of effective aperture and focus, and not, as in the English method, diameter of stop and focus. With reference to whether the new German lenses are as rapid as they would appear, any given stop, with lenses of the same focus, is smaller in German instruments than in English. With only two classes of lens that the author is acquainted with is the English system true—the single landscape and Dallmeyer's rectilinear landscape, in both of which the stop is placed in front, and the light is intercepted before the glass is reached. In the case of a doublet, however, the light passes through the front combination and converges before meeting the stop, being consequently more intense where it passes this spot, and it is evident that at this section as much light will be conveyed by a smaller circle as could be done by a larger one at the front of the lens. A stop of same diameter as the front lens will convey no more light than a smaller stop the size of the circle of convergent light at the diaphragm section. The author has measured by the Continental method a Steinheil aplanat, Series 3, of $10\frac{9}{10}$ inches focus, and a Goerz anastigmat of $10\frac{3}{4}$ inches. After focussing on a distant object and ascertaining the focal length by Grubb's method, the focussing screen was replaced by a piece of card having a pinhole through the centre. A piece of bromide paper was then exposed in the lens cap through the pinhole, which, being situated at the principal focus, the light proceeding from the lens would be in parallel rays, and the image of the aperture would be impressed on the paper. The result was as follows :—

	Focus.	Effective Aperture.	Focus divided by diameter of stop.
Goerz anastigmat.....	$10\frac{3}{4}$ in.	*f*-8	*f*-9·3
Steinheil rapid aplanat ...	$10\frac{9}{10}$,, ...	*f*-7·5	*f*-8·4

The English system is thus incorrect, and the error would, therefore, extend to the whole series. This point of aperture is, however, not the only one to be considered in arriving at the rapidity of a lens. The greater the separation of the two halves of a doublet, the less illumination would there be at the margins. The number of reflecting surfaces in a triplet must also tend to render them slower than doublets. Then there is the absorption of light by the glass, especially where heavy flint glass forms part of a lens. From some tests made, the author finds the rapid Steinheil has the advantage in transparency over the Goerz, but the Steinheil wide angle shows more falling off. The Concentric and the new Ross-Zeiss *f*-8 show very good results. With reference to the claim that the new Jena glass has less absorption than the old crown and flint glasses, it should not be forgotten that with one exception—the Concentric—all the lenses of this new series are much thicker. It is often said that long-focus lenses require longer exposures than short-focus, and, although this opinion has not been accepted by all, there seems good reason for the idea, the lenses being thicker and wider apart proportionately to their diameter. Eder's *Jahrbuch* for 1891 contains an article on the subject of absorption, by Dr. Miethe, who found that a certain lens required with an increase of aperture considerably more than its proportionate exposure, and which he put down to the absorption by the flint glass of the negative lenses in the combination which happened to be thicker at the margin than the centre. He conducted a number of experiments with Jena and some old kinds of glass, and a table which he gives shows the Jena to possess some advantage, especially in evenness between flint and crown; but the author doubted if this advantage was retained in the lenses themselves on account of their being mostly much thicker than the old rectilinears. Messrs. Hurter & Driffield have given a very perfect system for the measurement of speed and exposure of dry plates, but he believed lenses were factors in the problem also. He wished to point out that the standard of their intensity was only approximate, and that for most lenses the universal standard started on a wrong basis, thus affecting the stop values throughout. This error might be set right by substituting the effective aperture for the fraction of the focus as the starting point. A lens aperture of *f*-4 might replace stop aperture *f*-4. A standard of intensity would also assist, and lenses might be numbered to represent the real intensity under a given angle, attention being given to absorption and other factors which mar their efficiency.

Mr. Beckett did not know that any better work would be done if the correct exposure were known. If three seconds were the correct exposure as generally understood, he would always give six, and maintained that a better picture would result by so doing. What was generally known as correct exposure was a bare exposure, and he would give more. He did not think a plate worth much unless it could stand twelve times this correct exposure. He thought it generally the case that plates were under-exposed. He pleaded for the English method of measuring stops, and said that some of the German lenses were now marked by the English method.

Mr. Atkins said that, when mounting lenses himself, he had always made the apertures of stops by the Continental method.

Mr. Mackie stated that there was no such term as correct exposure in itself. Development is a factor for consideration.

Mr. Henderson disagreed with Mr. Beckett that under-exposure was the rule, and thought the reverse.

The Secretary agreed with Mr. Mackie that the ordinary amateur did not appreciate the difference in value of subjects, and said that an amateur would do well to study Hurter & Driffield's work.

PHOTOGRAPHIC CLUB.

June 3,—Mr. Stretton in the chair.

Mr. Drage mentioned that Mr. Alexander Cowan had met with an accident and fractured his leg.

The Hon. Secretary was asked to write to Mr. Cowan expressing the condolence of the members present, and the hope of his speedy recovery.

Mr. Wallis showed some prints upon some samples of paper which had been sent to the Club; he also showed prints from the same negatives on Ilford P.O.P., so that members could compare results. He mentioned that the new paper took about three times as long to print as the Ilford did.

Mr. Welford handed round some work which he had done on Wellington's new films.

Mr. J. B. B. Wellington then gave a demonstration upon

The Wellington Stripping Film.

In his opening remarks he said that the notion of supporting the sensitive film upon a flexible support was not new—in fact, it was as old as photography itself. The advantages gained by the employment of glass had counterbalancing drawbacks, and thus the attention of inventors had been constantly directed to the discovery of some kind of flexible, and preferably transparent film. Scott Archer had invented a film in which gutta percha dissolved in benzole was the support. In 1868, Mr. Geo. Dawson had a somewhat similar idea, and, in 1869, Mr. Warnerke invented the well-known film bearing his name. Pumphrey, of Birmingham, and Stebbing, of Paris, had each devised films, and they were followed by Morgan & Kidd and the Eastman Company, who coated emulsion direct upon a very fine quality of paper. To get rid of the grain, Warnerke had the idea of coating the paper film with emulsion on both sides. Paper as a support for negative films had never achieved a wide popularity. The Vergara film, in which the support was insoluble gelatine, was the next invention, followed closely by the stripping film of the Eastman Company. After this came the cut celluloid film in pretty much its present form. The Wellington film consists of a paper backing possessing an exceedingly fine grain impregnated with gum copal dissolved in alcohol; this permits the gelatine coating to be easily stripped from the paper when in a wet condition. The prepared side of the paper is coated with a sufficient thickness of gelatine to form a support to the film, and this compound paper and gelatine film is coated with a sensitive gelatine emulsion. The film thus prepared is intended for roll-holders. For using in sheet form, the other side of the paper is also coated with gelatine so as to give an even tension or strain to the compound film. Development, broadly speaking, is the same as for a glass plate, with a single exception, that "pyro and soda" are not recommended. The stripping process is not absolutely necessary, but, being very simple, will probably be generally resorted to. To strip the film, the fixed and washed negative is immersed for a few minutes in a bath which, for want of a better name, is called the "soaking" bath, as follows :—

Formaline	3 drachms.
Glycerine	2 ,,
Ammonia, ·880	1 drachm.
Water	20 ounces.

The addition of the ammonia has the effect of making the film more adhesive to the glass plate upon which it is subsequently dried, but too much ammonia makes the film swell. After soaking in this bath for five minutes, it will be found that the gelatine film can be stripped easily from its paper support. The film must now be laid down upon a piece of clean glass, prepared with French chalk, so that when dry it will strip. It is neither necessary nor advisable to squeegee the film down upon the glass. Mr. Wellington then proceeded to strip a few films which he had brought with him for the purpose, and he invited the Chairman and others present to try the stripping operation for themselves. In every case the stripping was satisfactorily and easily effected.

Mr. Bedding said that he had been using some of the films, and he found them strip quite readily.

Mr. Bridge asked if Mr. Wellington had tried to make lantern slides from the film negatives.

Mr. Wellington reminded Mr. Bridge that he had shown some slides at the Club, which were not only made upon his film, as far as the negative was concerned, but the lantern slides also were produced upon a stripping film.

Mr. F. Hare recalled with satisfaction his use of the old Eastman paper film, and regretted that it could not now be obtained.

Mr. Drage said that the new film would entirely do away with halation.

The Rev. F. C. Lambert and Mr. Mackie questioned whether this would be so, and Mr. Wellington gave an instance in which halation had occurred.

Mr. Fry said that there were two distinct kinds of halation, that due to reflection from the support, and that due to dispersion in the film itself.

Mr. Mackie mentioned a third kind, due to the dust in the atmosphere.

Mr. Bedding passed round prints showing a fourth kind, and the discussion turned for the moment upon halation.

Mr. Welford said he had only one difficulty with the new films. Having explained this,

Mr Wellington replied that his difficulty would disappear if he did not squeegee the stripped films down upon glass, but simply laid them down. Mr. Wellington then took one of the films which he had stripped, and demonstrated how it should be laid down upon the glass without squeegeeing or stretching the film in any way. He avoided air bubbles by placing the film down from the centre first.

Mr. Lambert asked if films which were spoilt by having dried irregularly could be dried a second time?

Mr. WELLINGTON said yes, and added that a film dried with the paper backing upon it could afterwards be stripped. After having drawn attention to the ingenious method by which his rolls of films could be fitted into any of the existing roll-holders, Mr. Wellington was cordially thanked by the Chairman for his most interesting and impartial statement of the merits of his new film.

Brixton and Clapham Camera Club.—June 2, Chairman, Mr. W. Fraser (Vice-President).—A series of slides, *Balmoral and the Western Highlands of Scotland*, was shown and described by Mr. W. H. Whittard. Entries for the members' "Landscape" competition close on the 16th inst. Mr. Horsley Hinton has kindly consented to judge.

Hackney Photographic Society.—June 2.—Mr. W. E. DEBENHAM gave a lecture on the subject of—

LIGHTING,

in the course of which he said that, for distant views, a rather sharp side lighting should be chosen, and the sun should not be too high in the heavens. In photographing distance there was a tendency to get too much flatness on account of the interposed atmosphere. For ordinary landscapes and marine subjects the lighting should be rather decidedly on one side; lighting from behind the subject and from behind the camera in both cases tended to produce flat results. For shutter work it was desirable to have the light rather more behind the camera, and the sky should have some brightly lit clouds to illuminate the shadows. In photographing the human figure good results could be obtained in the open air, and in rooms with proper management. The lecturer showed by diagrams how, in the former respect, the back wall of a house could be utilised in conjunction with a garden wall running at right angles to it. In indoor photography, whether in a studio or in a room, it was a mistake to have a small area of principal light, it tended to produce harshness, as witness the effect of using a single flash lamp. Reflectors were very useful, and the position and placing of these was a very important matter. The reflected light must not be too strong; but ordinarily it was not so, for it could not be so powerful as the original light it reflected. Artificial lighting must be managed on the same principle—a large area of illumination and suitable reflection. This enjoined the use of a number of flash lamps over a large space. For copying work the light should as much as possible fall directly on the subject, and the side lighting should be equal to avoid showing grain; but, in copying hand work generally, such as drawings and paintings, the lighting should be regulated in the direction to agree with that in which the work was originally done. In the course of his lecture, Mr. Debenham dealt very fully with portraiture in rooms and in the studio, illustrating his remarks with diagrams, and replying to the many questions which were asked.

Aintree Photographic Society.—June 5.—During the evening the PRESIDENT (Mr. C. H. Adkins) introduced and explained the various parts of a hand and stand-focussing camera which has been built to his own designs; and, as it contains several new and useful features, he has had the same protected by patent. Another item was the stereo-photo-duplicon, which is now being placed upon the market by J. Fallowfield. One of these had been kindly lent to the Society for the evening. The object of this new patent is to enable one with a half-plate camera and one lens to obtain a stereoscopic picture of either moving or still life, landscapes, &c. Before the close of the business it was decided to have no ordinary meeting in July or August next, on account of the summer holidays.

Edinburgh Photographic Society.—June 3, Mr. J. C. Oliphant, M.A., presiding, when office-bearers for next session were elected. Messrs. H. J. Blanc, R.S.A., and J. C. Oliphant, M.A., were elected Hon. Presidents; Mr. F. P. Moffat, President; and Messrs. James Patrick and A. Eddington, Vice-Presidents. The Secretary (Mr. J. S. M'Culloch, W.S.) and the Treasurer (Mr. George Cleland) were re-elected. There were three vacancies in the Council, and Dr. Scott Lauder and Messrs. James Hay and James Ritchie were elected to fill the posts. The reports of the Secretary and Treasurer showed the Society to be in a very prosperous condition. There were close on 400 members on the roll, seventy-six having joined during the past session. A paper entitled,

ONE WORD MORE ON PHOTOGRAPHY AND ART,

in which the claims of photography to be considered an art were ably put forth, was read by Mr. JOHN WARRACK, jun. The artistic photographer, he held, could, like the painter, infuse an element of personality into his work, and photography, as a means to picture-making, was too often condemned by those who did not fully understand what could be done with the camera in the hands of an artist. Mr. Warrack was warmly thanked for his paper.

Photographic Society of Ireland.—May 28, Annual Meeting, Professor J. A. Scott in the chair.—The election of officers for the coming session took place, with the following result:—*President:* Alfred Werner.—*Vice-Presidents:* Messrs. L. R. Strangways, M.A., and J. A. C. Ruthven, A.M.I.C.E.—*Council:* Messrs. J. Armstrong, J. H. Gane, A. M. Geddis, R. M. Inglis, J. M. Keogh, and George E. Matthews. Members retaining their seats on the Council for another year are Messrs. H. Goodwillie, J. H. Hargrave, B.A., and J. R. Simpson. Mr. W. Bewley was unanimously re-elected Hon. Treasurer, and Mr. V. E. Smyth was elected Hon. Secretary, in the room of Mr. Ruthven, who resigned. A cordial vote of thanks was passed to Dr. Scott for the able manner in which he filled the presidential chair during his term of office, and a like vote was passed to Mr. J. A. C. Ruthven for his untiring efforts on behalf of the Society as Hon. Secretary. Mr. Alfred Werner distributed the medals to the successful exhibitors at the Society's last Exhibition. This meeting concluded the session, which in every way proved very satisfactory to the Society.

Patent News.

THE following applications for Patents were made between May 27 and June 3, 1896:—

PHOTO-RELIEF PROCESS.—No. 11,604. "Means for Transforming in Relief Photographic Negatives and Dispositives, or Turned Negatives, without any Copying Process, for Artistic and Industrial Purposes." M. MAGNUS.

CAMERAS.—No. 11,771. "Improvements in Photographic Cameras." W. J. LANCASTER.

KINETOSCOPE.—No. 11,836. "Improvements in Apparatus for Taking and Exhibiting Photographs in Series." J. TRAME and A. DE MAROUSSEM.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

INFLUENCE OF AIR ON DEVELOPMENT.

To the EDITORS.

GENTLEMEN,—In reading this week's BRITISH JOURNAL OF PHOTOGRAPHY, I notice the report of a discussion *On the Accelerating Action of Air on a Plate during Development.* I do not make much study of such technical points, but I have repeatedly observed while developing tentatively that no sign of an image appears for a considerable time, perhaps thirty to sixty seconds after the application of the developer. Then, when a few more drops of alkali are put in the measure glass, and the developer is poured off the plate into the measure, thus leaving the plate exposed to the air, the image will come out, sometimes so rapidly as to lead one to fear over-exposure. More than once I have added pyro and bromide, only to find later that the exposure was about correct, after all, and that more alkali was needed to satisfactorily complete development. I remember being taught during my apprenticeship that the less developer used the better the *quality* of the negative, and my experience is that, if enough developer is used to just cover the plate with a wave from end to end as the dish is rocked, the density and gradation of the negative are superior to what is produced when the developer is half an inch deep. Whether this is because the lesser quantity of developer used, as I have indicated, allows the air to reach the plate, I cannot say. I have found a large quantity of developer more likely to give the effect of under-exposure, so far as the absence of shadow detail produces that appearance.—I am, yours, &c.,

CHARLES HENRY HEWITT.

Catherine-terrace, Gateshead-on-Tyne, June 6, 1896.

MR. CHILD BAYLEY ON ART.

To the EDITORS.

GENTLEMEN,—Mr. Child Bayley insinuates that when the Linked Ring hold their Exhibition they carefully confine it to their own works, and only admit a stray "outsider" or two. The object of Mr. Bayley seems evident. "You send to our show at Pall Mall, not to the other one, which is only a sham. *They* don't want anybody's work but their own; the chances are your pictures will not be accepted; therefore, to avoid that, support the old firm, who open their doors and admit everything."

I do not know that it is wrong for a man, even the Assistant Secretary to a society, to boom his own Exhibition, but it should not be done by the aid of mis-statements.

As Mr. Bayley has consented to his paper being published, and possibly circulated widely, it is as well that any one reading it should be acquainted with the real truth, although it may be distasteful to Mr. Bayley to have it stated.

I have extracted the following figures from the catalogue of the Salon Exhibition, 1895, and any one who has a copy can verify them. There were 118 exhibitors, 35 members of the Linked Ring, 83 non-members. There were 323 photographs exhibited, 158 by members of the Linked Ring, 165 by non-members.—I am, yours, &c.,

L. C. B.

GLASGOW PHOTOGRAPHERS AND THE FACTORY ACT.

To the EDITORS.

GENTLEMEN,—Some months ago Mr. J. Stuart, of Glasgow, called a meeting of the professional photographers of Glasgow and district to take into consideration the Factory Act in connexion with the printing department of photographic work.

By the Act, as it then stood, all the printers had to leave work at one hour, at the meal interval (if women or young persons), and during that time printing had to be suspended. In the winter time this was a serious drawback, because, if the prints were left, sun and rain might

occur, and not only would the prints be ruined, but the negatives also in many cases.

The matter was then considered by the professional photographers, and, after a good deal of discussion, it was resolved to apply to the Home Secretary to be put under the Continuous Process Act, to go at different hours, always remembering that no females or young persons work more than five hours at a stretch without rest and a meal.

It will be seen by the enclosed official copy, sent by the Secretary to Mr. Stuart, that he has considered the matter, and they now have the privilege of having their *employées* working at different hours.—I am, yours, &c., G. M.

[Official Copy.]

STATUTORY RULES AND ORDERS, 1896.
No. 330.

FACTORY AND WORKSHOP.

Order of the Secretary of State dated May 1, 1896, extending Special Exception :—Different Meal Hours.

Whereas the Factory and Workshop Act, 1878, section 52, contains a special exception to the effect that the provisions of the Act which require that all the children, young persons, and women employed in the factory or workshop shall have the times allowed for meals at the same hour of the day shall not apply in the cases therein referred to; and power is given to the Secretary of State to extend such exception to other classes of factories and workshops:

And whereas it has been proved to my satisfaction that in the class of factories and workshops wherein there is carried on the printing of photographs it is necessary, by reason of the continuous nature of the process and the special circumstances affecting such class, to extend thereto the foregoing special exception, and that such extension can be made without injury to the health of the children, young persons, and women affected thereby:

Now I, the Right Honourable Sir Matthew White Ridley, Baronet, one of Her Majesty's Principal Secretaries of State, by this Order, made under Part Two of the said Act, extend such special exception accordingly to factories and workshops in which is carried on

The Printing of Photographs,

subject to the condition that, in every factory and workshop the occupier of which avails himself of this exception, there shall be affixed a notice showing the names of the children, young persons, and women employed in the factory or workshop, and the times allowed to each of them for meals.

Whitehall, May 1, 1896. M. W. Ridley.

ASSISTANTS AND THEIR GRIEVANCES.

To the Editors.

Gentlemen,—My attention has been directed to a letter by Frank Brisley, which appeared in your issue of May 29.

I am asked the question as to what is meant by the sentence where Mr. Brisley expresses the hope that assistants generally, and Mr. Randall particularly will not relax their efforts to promote the establishment of a Photographic Assistants' Branch of the Shop Assistants' Union.

I cannot say what Mr. Brisley means; but, as far as we are concerned we have no such intention. What we have offered to do is to admit photographic assistants to our branches on exactly the same terms as we admit other assistants. At the present moment only a small proportion of the shop assistants have joined the National Union; they need the help of the photographic assistants, and, in return, any assistance that can be rendered by the organization in existence will be given. Any member has the power to bring before the Committee of the branch of which he or she is a member, any grievance under which he or she may suffer, and, if the case cannot be dealt with by the local Committee, an appeal can be made to the executive, and by this means whatever power the organization possesses as a whole can be brought to bear upon any grievance any member may bring forward.

In conclusion, I would like to point out that no organization can hope to do much for its members until a fair proportion of those eligible to join become members, so that it is perfectly obvious that all those assistants who believe in organization should join at once, and then try and urge others to do likewise.—I am, yours, &c.,

Jas. Macpherson, *General Secretary.*

National Union of Shop Assistants, Warehousemen, and Clerks,
Head Office, 55 and 56, Chancery-lane, London, W.C.

THE CARDIFF EXHIBITION.

To the Editors.

Gentlmen,—Probably I am a dullard, and cannot see the connexion, but what on earth have amateurs taking pay for work done to do with my letting the under part of my house for barber's purposes? It suits me, it hurts nobody. An individual did call on me one day last week, and, ignoring the usual courtesy of giving his name, stated in a somewhat erratic and pretentious manner that he was a professional who had joined a syndicate of amateurs formed to run a studio on the Cardiff Exhibition ground. (It takes more than one swallow to make a summer). He said, "You take portraits for 3*s.* per dozen." I did not deny the soft impeachment, but enlightened him to the fact that that sum covered the cost of midgets only.

Now, Gentlemen, Professional *versus* Amateur: I became a professional photographer in 1858, and, as such, have occupied my present premises for thirty-two years (since 1864).

I also claim to be a professional musician, having joined the musical ranks in 1851, and have occupied a seat in the Theatre Royal and other orchestras in Cardiff for twenty-eight years. Thirty-eight years a photographer, forty-five years a musician, and following both professions concurrently. What am I in either—professional or amateur? Is it incompatible for a man to follow two professions? Let Mr. Booth put that question to his friend Mr. Freke, and hear his opinion thereon.

I am one of the few professionally oldest photographers left in Cardiff who began the torture of the silver bath before the advent of *cartes-de-visite*.—Thanking you in anticipation for the insertion of this letter, I am, yours, &c., Alfred Horton.

Central Studio, Caroline-street, Cardiff, June 7, 1896.

To the Editors.

Gentlemen,—It is but a poor defence of the action of the Cardiff Photographic Society, on Mr. Wm. Booth's part, when he asserts that, because professional photographers could not see their way to successfully run a studio in the Exhibition grounds, it thereupon became incumbent on Mr. Wm. Booth and his band of amateurs to take the matter in hand, thus running completely counter to the recognised ethics of amateurism. —I am, yours, &c., The Kaiser.

15, *Newport-road, Cardiff, June* 8, 1896.

To the Editors.

Gentlemen,—With reference to the letter *re* Cardiff Exhibition, which appeared over the name of Mr. A. Freke in your issue of May 22, the facts of the case are as follows:—

The President of the Cardiff Photographic Society was requested by the Executive Council of the Exhibition to form a Committee to work the Photographic Section. This he did, and, taking previous Photographic Exhibitions as a basis, a lump sum was asked for to cover cost of same. This, however, could not be granted, as no provision therefor had been made in the estimates, therefore the Committee ceased to exist.

Later, the President was asked if he could form a Committee to work the section in exchange for certain concessions, one of which was the studio of which Mr. Freke complains. That the Committee did not intend to run the studio themselves your advertising columns will prove; but, not having received an offer for same, they were compelled to engage two professional operators, with assistants. That the studio is run by amateure is a report put about by Mr. Freke for his own ends.

This gentleman has been a dealer in similar monopolies, having, to my knowledge, bought the sole photographic rights at two previous Exhibitions held in Cardiff. These facts he should have borne in mind before rushing into print. Moreover, he signified his intention of making a bid for the one under discussion, and was waited upon the day before the date upon which tenders were advertised to close. He preferred, however, to play a waiting game, and when, a month later, he wished to treat, he found he had waited too long, and that other arrangements had been made; hence the heartburn.

The only way in which the name of the Cardiff Photographic Society has been used is in connexion with the Exhibition of Photographs in the Art Galleries, which is calculated to do the Society an immense amount of good locally and should largely increase the membership. The Society participates in the profits of the concession, if any, but contributes nothing; and, if it results in a loss, this will be borne by the few who have had to do the work and advance the money.—I am, yours, &c.,

Cardiff, June 3, 1896. T. H. Faulks,
Hon. Secretary Cardiff Photographic Society.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

Photograph Registered:—

Henry Goldsmith, Hay Cottage, Glen Aldyn, Ramsey, Isle of Man.—*Photograph interior of mud cottage, Jurby East, owned and lived in by William Corlett's Uroil E-Grianey.*

Double Exposure.—C. Vennard. Evidently the plate has been exposed twice.

BROWN TONES.—A. M. The prints referred to are, for the most part, in carbon. If not, on specially prepared (by the users) silver paper.

PHOTOGRAPHING ON THE RHINE.—GERMAN TOURIST. So far as we are aware, there are no restrictions with regard to photographing the scenery on the Rhine, so long as you are not in the neighbourhood of fortifications or military stations or works. Be very careful on this point, or you may find yourself in trouble.

VIGNETTE MASKS.—Sensitise thin paper, and then print, shading those portions in proportion as the graduation is required. When fixed, they need not be toned; immerse in melted paraffin, and iron off with a hot laundry iron between blotting-paper. These papers are sold so cheaply that you will find it more economical to purchase than to make them.

CAMERA BELLOWS.—G. B. M. says: "I have a large camera with cloth bellows which has become spoilt by innumerable holes. Could you tell me if I could remedy this in any way; or, if that is impossible, give me the name of some one in London who would replace the defective one with a new bellows?"—There is no remedy but a new bellows, and that any camera-maker will supply.

PHOTOGRAPHIC APPARATUS ON THE HIRE SYSTEM.—EAST DEVON says: "Would you kindly tell me if there is a firm of photographic dealers who supply things on the hire-purchase system? I saw the address in THE BRITISH JOURNAL OF PHOTOGRAPHY some time ago, but cannot find it now."—We do not know the address. Possibly some of our readers may be able to supply it.

SUGGESTED FADING OF BROMIDE PRINTS.—C. VANDYCK. We should scarcely characterise the pictures as having "faded." The whites appear to be slightly degraded, which probably has arisen from prolonged exposure to light or "age," as you suggest, but the pictures are in such a good condition that we cannot imagine why the Sydney photographer failed to obtain a good result from them. Always glad to be of service.

FERROTYPE.—R. WADE. There is very little surprise that you have failed in getting good results. Sixty grains of nitrate of silver to the ounce of water for the sensitising bath could lead to nothing but failure. You are quite wrong in supposing that, by increasing the strength of the bath, you will obtain greater whiteness in the image. Thirty to thirty-five grains to the ounce is quite strong enough for a ferrotype bath; some use a weaker one than that.

SITUATION IN PARIS.—NEMO says: "I am desirous of obtaining a situation in Paris. Could you tell me the name and address of the paper for France corresponding to THE BRITISH JOURNAL OF PHOTOGRAPHY of England, and whether the average money is as good there as here, also the day the paper is published?"—We fear we cannot help you. However, you might address *L'Amateur Photographe*, 21, Boulevard St. Germain, Paris; or *Le Moniteur de la Photographie*, 55, Quai des Grands Augustins, Paris.

COLOUR FOR STUDIO.—BLINDS says: "I should feel obliged if you would advise me on the following: What colour blinds for north lighted studio for all-round work? What colour walls and woodwork? From ridge to eave is matchboards, then plastered wall, and matchboard dado. Would light staining and varnishing do for woodwork or floor, or would it reflect too much?"—Light green or dark blue will do quite well for the blinds, or even unbleached calico may be used, but the former will look best. A dark French grey will be a good colour for the walls, but anything like a varnished or glossy reflecting surface should be avoided.

RESIDUES.—HYPO BATHS says: "I have about a dozen gallons of old fixing baths I am desirous of converting into cash, and should be obliged if you can give me an idea as to the quantity of liver of sulphur required to precipitate silver. Also would you advise treating bulk in barrel or in separate vessels, a gallon or two at a time? In any instructions I have seen, no idea of quantities has been given."—The quantity of liver of sulphur, of course, is dependent upon the amount of silver there is in the solution. Add the liver of sulphur till no more turbidity is produced, after the solution has stood a few hours, by a further addition. It matters not whether the solution is treated in bulk or piecemeal.

OBTAINING PATENT.—PATENT asks: "Will you please inform me through your 'Answers to Correspondents' which is the safest and cheapest way for any one in the country to obtain a patent, and who would be the best agent to get a patent connected with photographic apparatus, and what would be the cost?"—The safest way is to put the matter in a respectable and old-established patent agent's hands. The cost then will be, for the term of four years, about twelve or fourteen pounds. If our correspondent does the work himself, the Government fees for four years are four pounds; a provisional protection for twelve months, one pound. If the invention is of any value, we should advise the employment of a patent agent.

WASHING PRINTS.—J. B. C. writes thus: "Is it to be inferred from your report of the proceedings of the London and Provincial Photographic Association and the paper by Messrs. Haddon & Grundy that thirty minutes' washing in a Wood's or other running water automatic washer is amply sufficient for P.O.P. prints after fixing, and that the same suffices for bromide prints and for negatives on film, that the presence of alum would not affect the thorough washing in the above time?"—Messrs. Haddon & Grundy's experiments were made with albumen paper, and not with gelatine, also the paper was fixed in a twenty per cent. solution of hyposulphite of soda for twenty minutes. Further, the paper was kept in motion by hand all the time it was in the hyposulphite and also in the washing waters. Their experiments cannot be taken as applying to gelatine prints and negatives. That would require further experiment.

SENSITISING PAPER.—MOTTLED says: "I. I am at present troubled by my sensitised paper going mottled. It goes this way whilst pinned up to dry, after being taken off the nitrate bath, which I keep up to about seventy per cent. I enclose you a small piece which I have just done, and which is hardly as bad as I have had it. It seems to me as if the paper was greasy. I do not think it is the fault of the bath. If you can solve this question for me, I shall be ever so much obliged. 2. I wish to evaporate the nitrate bath down. I have got a dish and stove suitable. Will you kindly tell me how to proceed when I have evaporated all the liquid away, so as to make the bath up again?"—If our correspondent is using his silver bath at seventy per cent. strength, we are not at all surprised he does not get on satisfactorily. We presume, however, that he really means seventy grains to the ounce. A little alcohol in the silver solution will sometimes get over the greasiness. If not, the paper must be blotted off with pure blotting-paper. 2. Evaporate the solution to dryness and weigh the crystals, then dissolve in the proportion desired.

DEPOSIT ON NEGATIVE.—BEGINNER says: "Will you kindly inform me, through the medium of the JOURNAL—1. What is the cause of the white deposit on the film of the negative herewith? 2. Can it be cured, and how? 3. How it can be prevented? The plate is Ilford special rapid; developer, hydroquinone. The plate, after development, was immersed for about ten minutes in a saturated solution of alum, and then fixed in the usual way. It was then washed in a zinc bath with running water from the tap, by means of an indiarubber tube, for a full two hours. The deposit appeared after drying. This is the worst of four plates, one of which is quite free, although, as far as I know, they were all treated in the same manner. Is there any publication which describes the working of the various kinds of hand cameras and the advantages of each?"—In reply: 1. You evidently did not wash the negative sufficiently after its immersion in the alum bath. Plain water and a little friction has removed the deposit on the negative sent. The remedy, therefore, is obvious. 2. Not that we know of. A copy of the ALMANAC contains mention (in the advertisement pages) of most types of hand cameras extant.

CONVENTION. LENS. STUDIO.—STUDIO puts the following queries: "1. Please give address of proper person to apply to. I want to be present at the Leeds Photographic Convention. What is the subscription? 2. Would a Ross's cabinet lens, worked at *f*-11, give as good a group photograph as a Ross's extra-rapid universal symmetrical at *f*-11? The latter lens is 9×7 for studio work. 3. What is the best type of lens (Ross's or Dallmeyer preferred) for general work in studio, 8½×6½, must be as rapid as their cabinet series? 4. How can I repair some large papier-mâché trays? They are coming uncemented at corners, *i.e.*, the different thicknesses of boards are separating, and forming four separate boards, instead of one solid piece. Could I fasten them by screws or rivets, and then cement over again? How can I make the very hard black paint or varnish these trays are painted with? 5. Is it possible to produce *first-class* results in a studio of the following descriptions: side-light of studio, 10×9 ft.; top-light of studio, 10×12 ft.? At south side there is another high building. If you can give me any help—what is the best plan of blind arrangements, and best position for sitter?—I should be very thankful."—In reply: 1. Mr. R. P. Drage, 95, Blenheim-crescent, W. The subscription is five shillings annually. 2. Practically, yes; if both lenses be of the same focal length. 3. If the lens must be as rapid as the cabinet lens, there is no better form than that. 4. Evidently the trays are worn out. Perhaps they may be patched up with marine glue. Papier-mâché goods are japanned. 5. Yes, very good results. But we should advise you to continue the glass right up to the building on the east side of the studio, and put the dark room at the middle of the south side. You can then have the sitter at either end, according to the light at the time. Ordinary unbleached calico for the blinds.

FRILLING FILMS.—COLONEL GUBBINS writes: "I am an old amateur photographer, but I am quite nonplussed. I have recently returned from a trip to Italy (Milan, Verona, Venice, Ravenna), where I did a good deal of work, using films. They were the remains of what I got two years ago. When I came to develop them, I was disgusted at the way they frilled. Two came off the celluloid altogether, only about two or three of those that I have developed have not frilled badly. With one I made a small leaden trough, three-quarters of an inch by half an inch and one inch longer than the film, put beeswax into it, heated till the wax was melted, and, in the dark room, dipped all four edges of the film into the melted wax. There was no frilling in this case, but I would sooner work with some other make than have that bother with each. I had *permessos* to take the interiors of several churches, a condition of granting a *permesso* being that I was to send three prints from each negative to the authorities. Can you tell me of any way of preventing the films from frilling? Would alum before developing affect the development? As in every case, except one, which could be explained, the frilling commenced at, and worked inwards from, the edge, it appears to me (1) that my size (7½×5) is got by cutting up larger ones after they have been coated; (2) that the coating is torn and lifted from the support either from carelessness in cutting up or from the cutter being blunt. If you can help me to get over my difficulty, you will greatly oblige."—We do not altogether like the idea of alum before developing, though that would, doubtless, be a preventive. As the waxing operation prevents the frilling, and is perfectly safe, we should be inclined to adopt that. We have, when we have had plates that frilled badly, rubbed the edges round with a paraffin candle, and then, after development, alumed the plate before fixing. That has proved a cure. It is possible that the cause may be as suggested.

*** Several answers to correspondents unavoidably held over.

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EX CATHEDRÂ.

The unfavourable comments we recently passed on the quality of the lantern slides of Buluwayo scenes and incidents that were exhibited at the Alhambra Theatre of Varieties induced a well-known lantern-slide artist to write to the management informing them that he was open to undertake orders for the production of optical lantern slides of "first-class quality only." This gave Mr. Moul, the General Manager, the opportunity for a peculiarly happy reply, which we append.

* * *

"Whilst not prepared to give you an order," writes Mr. Moul, "I can suggest to you going out to South Africa or the Soudan, and endeavouring to obtain pictures from subjects of equally vivid interest to those exhibited by me here at the Alhambra. Under the conditions which you will probably find compulsory, you may discover it fairly difficult to get what you term 'slides of first-class quality only.' Should you, however, undertake such an expedition, and be fortunate enough to obtain such subjects as I have exhibited, and as well taken and in equally good condition, I shall be only too pleased to consider the exhibition of them at the Alhambra when you have them ready to propose to me."

Mr. Moul is, of course, entitled to make the most of the difficult conditions under which the Buluwayo photographs were obtained, for which nobody would be readier than photographers to make allowances; but we fear that the public, which pays its money to be entertained and amused, does not trouble itself much about the technical difficulties that have to be contended with in the production of photographs, or other parts of the programme, so long as it is satisfied with what it pays to see and hear. However, we hope that the next photographs shown at the Alhambra will be better than those we are now referring to, although, if we might tender a bit of advice to the management, it will probably be more to the taste of its audiences if lantern-slide entertainments are not included in the programme. We do not think that kind of thing is wanted in Leicester-square.

* * *

One of the features of the Speaight Studio in Regent-street, which we recently visited, is perhaps sufficiently novel to merit special reference. Messrs. Speaight intend devoting particular attention to theatrical portraiture, and to that end have provided facilities in their studio for the employment of a system of lighting which will impart to the photographs of stage ladies a footlight effect, intended to convey the appearance of the photographs having actually been taken in the theatre.

* * *

We observe with regret the announcement of the death of Colonel V. M. Wilcox, President of the E. & H. T. Anthony Co., of New York. Colonel Wilcox joined the firm about thirty years ago, and became successively partner, secretary, vice-president, and president. He was much esteemed by a large circle of business and private friends.

* * *

The many inquiries regarding postage-stamp portraits that are just now being sent us induce us to refer to some very good specimens of this kind of work that come from Mr. Alfred Pumphrey, of 62, Stanhope-street, Birmingham. They are supplied in gummed sheets, fifteen copies being made of the original on a quarter-plate, and the prices for prints and negatives are moderate.

* * *

A suggestion for overcoming the cockling tendency of mounted gelatino-chloride prints reaches us from Mr. A.

Martin, photographer, Wanganui, New Zealand. Mr. Martin places the mounted prints in long grooved frames to dry. This imparts some degree of convexity to the photographs, which, when taken out of the frame, are quite flat, owing to their natural inclination to cockle being overcome by their having been well bent back. The hint may be of use to some of our readers. The frames, according to a photograph Mr. Martin sends us, are simply long grooved parallel bars, joined together at the ends.

* * *

The value placed upon the services of professional photographers by some commercial firms is well illustrated by the copy of a correspondence which has been placed in our hands by Mr. Henry Hill, photographer, of New Brompton, Kent. A few days ago he was written to and asked his price for a negative of a set of engines and vertical boiler that he happened to have. He answered that his price for the negative (a cabinet-sized one) was 7*s.* 6*d.*, upon which he was informed that the price he was asking was "simply absurd," and that 2*s.* 6*d.* was "pleuty" for the negative, an offer which Mr. Hill declined. We presume that the offer of 2*s.* 6*d.* was meant to include the right of reproduction, but, in any case, it cannot be said to err on the side of munificence.

CROSS-LINE *VERSUS* CHESS-BOARD SCREENS.

Inquiries are constantly reaching us with regard to the "chess-board" screen for half-tone work, for which a patent was taken out by Mr. Deville, Surveyor-General for Canada. As its name implies, this is a screen composed of alternate transparent and opaque squares arranged chess-board fashion; but, up to the present time, we have not seen any of the results produced by its means, nor are we aware of any one having used it on this side.

At first sight it might be set down as only one more on the long list of whimsical variations from the ordinary cross-line screen, and yet, on looking more closely into it, it seems to present points of difference from the latter that would stamp it as a distinct and useful departure, although, on following these up still more closely, we are left in doubt as to whether, in practice, it will be found to behave in any essentially different manner from the cross-line, or perhaps even whether it is not a retrograde step. Let us briefly examine into the matter.

If we take an ordinary chess-board, composed of alternate black and white squares, we have what actually represents a greatly enlarged image of the half-tone screen so called; and, if we fill up the white squares in each alternate line, horizontal and vertical, we have a similarly enlarged representation of a cross-line screen, in which the opaque and transparent lines r of equal thickness. For purposes of comparison, we may take this form of cross-line screen, although in actual practice the screens are ruled in a variety of different ratios between black and white.

The first difference that strikes us is that, whereas in the chess-board screen each square, whether black or white, is bounded on every side by a square of the opposite character, those of the same character only touching at their *corners*, in the cross-line screen each white or transparent square is entirely surrounded on all sides, as well as at its corners, by an opaque zone equal in width to its own side. Instead, in fact, of its corners touching squares of the same character, as in the chess-board, these corner spaces are opaque, from which it will be seen that the first important point of difference is a more complete isolation of the transparent squares, and apparently a greater preponderance of black in opaque spaces.

In the chess-board obviously exactly half the space is opaque and the other half transparent; but, if we repeat the filling-in operation, by which we convert the chess-board into a cross-line screen, we shall find that we fill in just one half of the transparent squares, so that, whereas in the chess-board screen the ratio of black to white is 1 : 1, in the cross-line screen of equally ruled lines it is 3 : 1. This means, of course, that just twice as much light is arrested by the cross-line screen as by the chess-board, or, in other words, that, under similar conditions, the latter ought to work twice as quickly as the other. We shall see later on whether it actually does; but, if this were the only advantage to be gained, a similar result would accrue in the cross-line screen by making the opaque lines narrower.

The next, and perhaps a more important, point that must strike us is that, in a given area, the chess-board screen has just twice as many open spaces as the cross-line, or, in other words, in practice, the dots would be so much closer together, and therefore a proportionately finer grain would result. In actual figures, taking two screens in which the transparent spaces were equal, the result as regards mere fineness given by the chess-board screen would be similar to that yielded by a ruling of nearly one and a half times the number of lines to the inch. A chess-board screen of 120 squares to the inch would give the same number of dots in a given area as a ruled screen of 170 lines, and, *per contra*, to produce the same result as that obtained with a ruling of 120 lines, a chess-board screen of 85 squares would suffice.

To sum up what would seem to be the advantages of the chess-board screen, they may be put down as greater working rapidity, with finer grain, and perhaps a more equal distribution of the opaque and transparent spaces. How far these advantages can be sustained, we will now proceed to inquire.

First, in the matter of rapidity, we have already said that, if this were a real advantage, it can be easily attained in the cross-line screen by a narrower ruling of the black lines; but the fact that, in the Levy screens, the black lines are never less than two-thirds, and more frequently of equal thickness with the transparent, is, we think, sufficient proof that rapidity gained by simply increasing the amount of light passed is not an advantage. On the contrary, if we look at it from a different standpoint altogether, it seems probable that this feature in the chess-board, or, indeed, any form of screen, may be an actual disadvantage. Those who are familiar with the use of the screen know full well that the gradation, or half-tone, is obtained by the more or less complete closing up of the opaque dots formed by the light passing through the transparent openings in the screen. In the half-tones and shadows these dots remain detached and distinct, the aim being to get them graduated in size from the minutest points in the deep shadows until they touch and overlap in the high lights.

Now, in the chess-board screen the squares are already closed up by the corners, and present precisely the same appearance as the half-tones of a negative produced by means of the cross-lined screens. Granted, as it undoubtedly will be, that such a screen is capable, with suitable screen adjustment and size of stop, of rendering detached and isolated dots, it can only be by altering the conditions very materially from those that prevail with the cross-line screen, but more especially in the direction of using a smaller stop. This being the case, what

becomes of the increased rapidity of working? It is surely counterbalanced by the necessity for slowing down the lens, in order to avoid the too complete closing up of the high-light dots.

If the necessity for a decrease of the stop exists in connexion with the high lights, how much more will it be so for the shadows? The tendency will be, with the transparent openings in the screen so close together, for the high-light dots to close up with a much smaller stop than usual, the consequence of which will be that no detail will be obtainable in the shadows without a very long exposure with an inconveniently small stop, so that, in the long run, it is probable the chess-board screen will be found actually slower in working than a cross-line of ordinary ruling.

Turning to the question of fineness of dot, this can scarcely be claimed as an advantage, since it is a quality that is limited by the capabilities of the etcher and the printer. When extreme delicacy is required and can be utilised, it can be secured by using a fine ruling much more conveniently than by resorting to the chess-board screen, which, from its very nature, combines the opposite qualities of a fine and a coarse ruling, and, in the matter of the adjustment of the screen distance alone, it must prove vastly more difficult to manage than the ruled screen.

Lastly, we come to the apparently more uniform distribution of the black and white spaces, which would at first strike one as a valuable feature in connexion with the chess-board screen; but, in reality, this is purely imaginary, for the distribution of the transparent spaces, which is all that concerns us, is equally regular in the ruled as in the chess-board screen, only in the former they are separated by perfect zones of opacity instead of closing up at the corners, and it is this feature more than any other that gives to the cross-line screen what will, we think, prove in practice its superiority over its newer rival. It is this distinct isolation of the transparent spaces that allows scope for the influence of the screen to work, whether that influence depends upon diffraction or any other cause, and we think, after due trial, that the chess-board screen will be laid aside, as so many other fancies have been before it.

The Light of the Future.—This is what the gas engineers term the electric light, and they appear to be content that the term may be employed, as they contend that gas is the light of the present. At a recent meeting of the Incorporated Gas Institute the President put forth the opinion that gas was leaving electric light a long way behind. It appears that the capital invested in the latter is six millions odd compared with sixty-nine millions odd in gas companies, and, notwithstanding the immense boom which electric lighting has had, the output of electricity from the whole country did not reach one-half of the actual progressive increase of the gas companies.

Photography at the Pole.—The Arctic Expeditions are now well on their way. The yacht *Windward*, of the Jackson-Harmsworth Expedition, left St. Katharine's Dock on Tuesday, last week, to rejoin the party at Franz Josef Land. The *Windward* takes with her an immense stock of provisions and material. A telegram received on Saturday last says that the *Virgo*, with M. Andrée and others of the Balloon Expedition to the Pole on board, arrived the previous day at Tromsö from Gothenburg, and resumed their journey the following day. Photography is always to be made a feature of in Arctic expeditions, but, unfortunately, we see very little of the results. It is to be hoped that the various enterprises now *en route* will be able to show some good ones on their return home.

The "Greenwich Visitation."—This annual event, which dates back from the year 1712, brings into prominence the photographic work of the Observatory. A full account of the progress of the star catalogue is given, and from it we learn that it will contain, at the expenditure of a comparatively small cost, the positions of stars down to the eleventh magnitude to an extent ten times that of a well-known standard star atlas. Between two and three millions of stars will be included, seven years being considered the correct time to estimate for its full completion. The dome of the central octagon tower will be the home of the twenty-inch photographic telescope, the gift of Sir H. Thompson, which is now nearly finished, and may be seen at Sir Howard Grubb's works in Dublin.

Acetylene.—Such is the commercial importance of the "new gas" that a journal devoted to the development of acetylene has been brought out and is now published in Milan. The greater or less success of this illuminant is simply a question of cost of the calcium carbide from which it is made. One of the earliest expectations with regard to its possible future and usefulness was that it might be used to enrich ordinary coal gas of low illuminating power, which can be produced at a low rate, owing either to the inferior grade of coal that can be employed in its manufacture or to the larger amount that can be produced from a given quantity of coal when a large proportion of hydro-carbons is not needed to be present. To a certain extent these anticipations have been realised; but, with regard to water gas, which is largely used in some quarters, it is found that the use of acetylene leads to the loss of the illuminating power of the latter.

More Royal Photographers.—It is said that Prince Henry of Orleans is an enthusiastic photographer, and has quite an extensive collection of snap-shot photographs that he has secured on his travels. Photographs of tiger-hunting, we are told, figure largely amongst the collection. Our Royal family have always been enthusiastic in photography, from the Queen and the late Prince Consort downwards. The Princess of Wales is a votary of photography, and has her cameras, and the late Prince Henry of Battenburg had a well-appointed private dark room, adjoining the photographic studio, at Windsor Castle. A professional friend, a day or two ago, remarked to us, on the spread of amateur photography amongst fashionable society, that it meant ruin to professional photography. We do not take this pessimist view of the question, but we surmise it will not tend to its advancement as a business, or, at least, for the time being.

Pegamoid.—Under this name there is now being introduced into commerce a new substance which seems to combine in itself the respective virtues of leather, celluloid, waterproof varnish, and close grained wood. It is claimed that artificial leather made by its aid is superior to even real morocco, while American cloth and cheap leathers are entirely put out of court by the new substance, which is both waterproof and uncrackable; it will not chip off, nor spontaneously ignite, which are two qualities often characteristic of the materials named. It will do for covers of books and trunks, and may be used for maps and enamelled paper, and is very suitable for wall and ceiling papers, which can be easily washed and cleaned.

For this reason, if all that is claimed for it turns out to be realised, it should be of the highest value in photography. Dark-room papers and fittings, not to speak of cameras, hand or otherwise, should offer a very suitable field for its employment. We await, with considerable interest, some further account of its behaviour in actual use.

The Spy Scare Abroad.—Last week we called attention to the trouble that tourist photographers may find themselves in from the incautious use of the camera abroad. Even sketching sometimes gets the tourist into difficulties, as happened one morning last week at Metz. A party of British officers were visiting the battlefields of the Franco-Prussian war, and ascended the tower of the Cathedral,

and while there two of them commenced sketching. The military telephonic staff stationed in the tower noticed what they were doing, and at once communicated with the town commandant, with the result that they were forthwith arrested on suspicion of being spies. They were then taken from the guard-house to the chief police-office, where they were able to prove that there was no ground for the suspicion; they were then liberated, about midday. This occurrence, following quickly on that chronicled in our last issue, emphasises what was then said as to the caution that should be used when photographing on the Continent. It is only in France or Germany, however, that trouble is likely to arise, and there principally on the frontiers or in the neighbourhood of fortifications.

Extraordinary Prices for Pictures.—Some remarkably high prices for paintings were realised at auction sales last week—that is, high prices considering they were portrait subjects. At Robinson & Fisher's sale rooms on Wednesday, a picture of the Viscountess Clifden and her sister, by Romney, was sold for 10,500 guineas. The first bid was 1000 guineas, and then the bidding proceeded slowly till 5000 was reached. Then the competition became spirited between two bidders, when it was finally knocked down to Wertheimer for the sum just mentioned. At Christie's rooms, on Saturday, Sir Julian Goldsmid's pictures were sold, amongst which was *Dorothea, Lady Eden*, by Gainsborough, which sold for 5000 guineas; *Barbara, Countess of Coventry*, by Sir J. Reynolds 3800 guineas; *The Hon. Mary Moncton*, by the same artist, 7500 guineas; and *Mrs. Mathew*, also by Reynolds, 4000 guineas. A Romney *Mrs. Oliver* (*nee* Miss Shakespeare), *with a sleeping Babe on her Lap*, sold for 3100 guineas. The prices realised at these sales are amongst the highest reached for portrait subjects. The total amount of the last-named sale was a little over 67,000*l*.

Washing Prints and Negatives.—The report of the meeting of the London and Provincial Photographic Association, at which Messrs. Haddon and Grundy detailed their experience of the washing of albumen prints, has brought us several letters from some who evidently do not care for the trouble of print and negative washing, as to whether gelatine prints and negatives can be effectually washed, automatically, in, say, half an hour. *Albumen* prints can be effectually washed in that time under the conditions laid down by Messrs. Haddon and Grundy. It will be noted in the report that the paper was fixed in a *twenty per cent.* solution of hyposulphite of soda for *twenty minutes*. This is a very different condition of things from those that obtain in practice with gelatine papers when a weaker solution is used and a shorter immersion given, to say nothing of the difference between the thick film of gelatine and the thin one of albumen. But that is not the point entirely, it is the long immersion of the paper in the strong solution of hypo that is the factor in the case. Under these conditions the silver salts are completely dissolved by the hypo, and are then easily washed away by the water.

A Ladies' Night at the Royal Society.—The second *Soirée* of the season of this Society was held at Burlington House on Wednesday last week, and, notwithstanding the wretched weather, there was a large attendance of visitors. The subjects that proved most interesting to the ladies were photography and electricity, though some of the experiments in the latter were somewhat interfered with by the dampness of the atmosphere, consequent upon the heavy rain throughout the day. Of course there were experiments, galore, with the Röntgen X rays, and Messrs. Siemens Brothers showed a number of illustrations of electrical discharges *in vacuo*. It is needless to say that the stereoscopic photo-chromoscope was in high favour, particularly amongst the lady visitors. So also were the electric lantern exhibitions. The things shown at the Royal Society's *soirées* are always the latest novelties in science, but the *soirées* are only available to a select few. However, the Lords of the Committee of Council on Education have arranged for the public exhibition of a number of the objects shown at the *Soirée* in the Western Galleries of the Science Museum, South Kensington, where they can be seen by any one interested, and no doubt many of our readers are. The exhibition, it is arranged, will be open for about a fortnight, so that there is no time to be lost by those who intend to pay it a visit.

Recent Researches in Rontgen Rays.—The period of popular exposition is gradually giving way to scientific investigation, though it is still the case that no satisfactory theory is yet propounded as to the nature and source of the rays. Many improved forms of apparatus, principally in the shape of the Crookes' tube, are being brought forward, and a full account of them is given in a recent number of *La Nature*. The production of the rays is governed largely by the nature of the coil employed, and, above all, on the contact breaker. Unfortunately this is liable to constant disarrangement through the passage of the spark producing rapid destruction of the opposing platinum surfaces used, the result being the spark going askew, and thus leading to irregular action. M. Marcel Deprez has ingeniously avoided this difficulty by causing one of the contact points to rotate quickly, and thus render the passage of the spark uniform and even.

M. Masson, with the same object, causes the break to make action by a wheel containing a number of segments which bring about the making and interrupting of the current. Of course a separate electric arrangement is needed for this, and the expense of the installation is in consequence increased.

"It is difficult," says M. C. E. Guillaume in *La Nature*, "to give general indications as to the best length of spark to employ for working the tubes. This length depends, above all, on the tube, that is to say, the distance between the poles and the state of the vacuum, in a word, on the resistance of the interior of the tube."

How the Tiring of the Tube is Prevented.—When working with small sparks, the current from the cathode may be diverted by the use of a magnet which causes it to be deflected to any required direction and so utilise different parts of the glass. As Mr. Meslin has shown, the rays may actually be concentrated by means of a non-uniform magnetic field. M. Wood's method is alluded to with praise. The cathode in his form is suspended from a sort of pulley, so that, by moving the tube a little, the rays may be systematically diverted to different parts of the tube, and so the effect of "tire" obviated.

How to Test the Tube.—Using a focus tube of the Jackson form, MM. Joubert and Bertini Sans, of Montpellier, are credited with having devised a method which is almost a copy of that invented by Mr. Espin, and described some time ago in these columns. These gentlemen take a bundle of glass, or even metal, tubes, and pointing it endwise to the emitting surface of the glass, take a negative at the opposite end of the tubes. A series of circular discs will be shown, all varying in brightness, that where there is most action showing a denser circle, and thus the exact spot whence the rays issue at their best can be localised. All that is then needed is to use a diaphragm over the spot, and it may be made of any suitable shape according to the indications of the bundle of tubes negatives.

INTERNATIONAL PHOTOGRAPHIC COPYRIGHT.

There are two classes of persons to whom an elementary knowledge of the law of international copyright may prove useful—the large and increasing number of photographers, both professional and quasi-amateur, who regularly or occasionally produce photographs that possess a distinct commercial value, and the perhaps still larger number of people who buy photographs for business and other uses. To the one, such knowledge would ensure them the full benefits that should accrue by their works; to the other it would save the annoyance and expense consequent upon even unwitting infringements of

the copyright laws: but it is very doubtful whether any ordinary layman would feel inclined to undertake the labour necessary to disinter that knowledge from the tomb-like depths of the various Acts of Parliament, conventions, Orders in Council, and law reports in which it is contained.

It would be found upon search that the central point was the Berne Convention, the final ratifications of which were exchanged in that city on September 5, 1887, behind which were the International Copyright Act of 1886 and the Fine Arts Copyright Act of 1862, and in front was the Order in Council of November 28, 1887, while over all was spread the veil of the judicial decisions that interpreted the construction of these various enactments. The Convention was concluded between Great Britain, Germany, Belgium, Spain, France, and Switzerland, the Republic of Haiti and the Principality of Tunis; and by it those powers constituted themselves an International Copyright Union, taking power also to admit into the Union any other country that might thereafter accede to the Convention in writing, and reserving the right of withdrawing therefrom after giving one year's notice of their intention to do so. Their primary object was the common protection of the rights of authors of literary and artistic work, while subsidiary objects were the collection, arrangement, and publication of information as to such rights and their protection, and the making of arrangements for the convenient study of questions of general utility relating thereto. By a final protocol it was agreed that those countries of the Union which did not refuse the character of artistic works to photographs should admit them to the benefit of the Convention, but should not be bound to afford to the authors of such photographs any further protection than was accorded under their own internal laws. The protocol further declared it to be understood that the authorised photograph of a work of art which came within the definition given in the Convention should be given in *all* the countries of the Union legal protection for the same period as the principal artistic work itself enjoyed. The distinction thus drawn between the two classes of photographs should be carefully noticed. Put in non-legal terms, it comes to this: A photograph which claims to be of itself a work of art is only entitled under the Convention to protection in those countries where such a claim would be recognised and admitted under their own domestic legislation; but a photograph which is a reproduction of a copyright work of art—say, for example, of an original painting—would be protected in every country of the Union as fully and for as long a period as the principal right of reproduction of the work itself existed. Great Britain extends the benefits of artistic copyright fully and unreservedly to photographs; and so, equally or to a lesser degree, do France, Germany, and Switzerland.

The English Maker.

Thus far we have given the general principles. What, then, are the practical applications? The British Journal of Photography in February, 1895, contained a brief summary of the essential features of photographic copyright in this country, and from that it will be seen that the deposit of an official form, duly filled up, with the payment of certain very small fees (1*s.* or 5*s.*, according to circumstances), entitle the author of a photograph to copyright therein for the remainder of his natural life and for seven years after his death. Under the Berne Convention, such registration of his copyright here also entitles him, *ipso facto*, without any further formality, to rights in every country of the Union equal to those which each such country would have granted if such author had been a native thereof and had duly complied with the requirements of its internal laws. In other words, compliance by the author of an artistic work with the copyright laws of the country of origin of such work is equivalent to compliance with the requirements of the copyright laws of every country comprised in the International Copyright Union, and secures to the author rights and privileges equal to those granted to natives.

The Berne Convention also gave liberty for the accession thereto of the Powers on behalf not only of themselves, but also for all or any of their colonies or dependencies; and Great Britain, as well as France and Spain, took full advantage of this provision. The International Copyright Act of 1886 was passed for the purpose of enabling this country to accede to the Convention and to make it binding as part of the law of the land; and the Order in Council of November, 1887, made under the authority of that Act, expressly directed that as from December 6 of that year the Berne Convention should have effect throughout all the dominions of the empire.

The English Buyer.

The buyer is concerned in international copyright in exactly the converse direction of the maker—the one is anxious to secure his rights with their attendant benefits, while the other is naturally desirous of escaping from the liabilities which follow their infringement. In this country it is an infringement to make for sale, hire, exhibition, or distribution (though not for mere personal gratification), any copy, engraving, or reproduction, of a copyright photograph or the negative thereof by any means and in any size, and the penalty for so doing may reach to 10*l.* for each copy, with power of imprisonment in default of payment. By the Convention, the foreign owner of a copyright photograph becomes entitled here to precisely similar rights as the English owner of a copyright photograph registered under the Fine Arts Copyright Act of 1862; and therefore all buyers of foreign photographs, either at home or abroad, with the intention of copying or reproducing the same in any way for sale, hire, exhibition, or distribution, or any business purpose whatever, should be careful to ascertain whether they are actually copyright or not. If they are, the copyrights must be purchased, or a licence in writing for the use thereof, limited to the desired form or process if needful, must be obtained. In any case, the burden of ascertaining whether any photograph is copyright or not rests upon the buyer, and, although in this as in other countries notice of the fact is not required to be placed upon copyright photographs, ignorance of the fact will not prevent the destruction of the pirated copies, or be accepted as a defence to an action for penalties or for damages. It is also an infringement to import from abroad, or sell, publish, let on hire, exhibit, or distribute, without the consent of the proprietor, any copy or reproduction unlawfully made of a copyright photograph; but in such cases guilty knowledge is essential to a conviction. If that can be proved, the penalties are as before stated.

Ernest J. Richards.

LABORATORY NOTES AND NOTIONS.

Silver Waste and Residues.—Much has been written from time to time as to the best methods of recovering silver from the inevitable waste which occurs in the laboratory, whether of the manufacture of dry plates and sensitised papers or in the ordinary every-day practice of the amateur or professional photographer. The instructions given frequently involve a great deal of labour in precipitating, collecting, and drying, with the advice to send the results to the professional refiner for melting down, and ending with considerable dissatisfaction and disappointment at the final yield. In conversation with a dry-plate maker, I was somewhat surprised to find that even in a large factory this method was adopted, and that no attempt was made to reduce the residues and waste on the premises. The magnitude of the issue involved would be a surprise to an outsider, and evidently forms an important item in the profit-and-loss account of any firm doing a large trade in dry-plate or sensitised-paper making. In these days of keen competition, when makers are vieing with each other to produce the most rapid plate, the necessary cooking of the emulsion is pushed to a point perilously near the fogging stage, and accidents frequently happen, with the result that a whole batch, containing many pounds of silver nitrate in its manufacture, goes wrong, and is condemned as unfit for plate-making. A not inconsiderable leakage of silver also occurs in the first washing water of the emulsion, as well as in the various utensils in use in the laboratory itself. It will thus be readily understood that a perfect and simple system of waste-saving and reducing is a matter of considerable importance, both from the manufacturer's and consumer's point of view. In treating on this subject in the present article, I will not enter into the method of recovery by furnace. It is not every one who has a properly constructed furnace at hand, nor would such be a desirable addition to the factory or laboratory. There are other and equally efficacious methods, however, which I will describe, such as any one, with the simplest appliances, can readily recover his silver waste by, and utilise it for further work or experiment. The principal materials to be dealt

with are, first, emulsions, either gelatine, or collodion; second, prepared plates or paper; third, hypo fixing baths.

Emulsions.—In a condemned emulsion the quantity of silver is generally pretty accurately known, and therefore an emulsion forms a good test of the accuracy of the reducing process. As illustrating different methods of reducing, I will describe one or two carefully carried-out experiments I have recently gone through. A quantity of experimental emulsions, made by different formulæ, but each containing 20 grains silver nitrate or its equivalent in bromide to the ounce was taken and divided into portions of 20 fluid ounces. Each lot, therefore, contained 400 grains of silver nitrate in its formula for mixing.

The first thing to be done is obviously to get rid of the gelatine; and, fortunately, this is an easy thing to do. The emulsion is melted and put into a beaker or boiling flask of sufficient capacity, and two ounces of commercial sulphuric acid is added to it. Heat is then applied, and, when the liquid is near the boiling point, an ounce or so of common salt is added, a little at a time. The hydrochloric acid which is thus liberated in the emulsion quickly destroys the gelatine, and the silver bromide will be seen to separate as a coarse granular precipitate, which quickly subsides to the bottom of the vessel. When this takes place, remove from the fire or turn off the gas, and allow to settle completely, when the supernatant liquid may be poured away, and its place supplied by clean water. Again boil to get rid of all the gelatine, and decant, after allowing the silver to settle. To ensure purity of result, the washing should be repeated with several changes of cold water, but, from the coarse and heavy state of the silver, this is very quickly done.

The precipitate now consists of bromide of silver, with perhaps a trace of iodide and chloride. To reduce this to the metallic state is the next operation. For this purpose some finely granulated zinc, about half an ounce, was added, and very dilute sulphuric acid poured upon it. A gentle evolution of hydrogen gas at once commenced, and the white silver precipitate quickly changed to a black, dirty-looking powder. It was put aside for twenty-four hours, with occasional additions of sulphuric acid, until all the zinc was dissolved, when the resulting, muddy-looking product was well washed in water, and boiled at least once to get rid of all the zinc salts formed.

After allowing to settle and draining closely, nitric acid was added until no more of the silver would dissolve, and the resulting silver nitrate evaporated to dryness and weighed. There should have been 400 grains of silver nitrate; but, on weighing, there turned out to be only 280 grains, or a deficiency of 120 grains. This deficiency had to be looked for in the undissolved sediment, after treating with nitric acid. This was again treated with zinc and sulphuric acid, and then, after washing, with nitric acid, and a further yield of silver nitrate resulted, but still not satisfactory. The reducing was a third time resorted to, when the whole of the sediment dissolved in the acid, and 385 grains of silver nitrate altogether were obtained, but, as the operation was tedious and the result not what it should have been, the method was abandoned. Evidently the nascent hydrogen reduced the external portions of the granular silver molecules, but could not penetrate through them, and thus a considerable nucleus of unreduced bromide remained. Iron filings were substituted for the zinc in another trial and longer time allowed, but with no better result.

Another twenty ounces of emulsion was taken, and the gelatine got rid of in the same way as the last, and the precipitate well washed; but this time the reducing properties of sugar and alkali were employed. To the drained precipitate 10 ounces of water, 2 ounces of white sugar, and 1 ounce of soda hydrate were added, and the whole brought to brisk ebullition, which was maintained for thirty minutes. By that time the whole of the silver appeared to be reduced, and of a brownish black colour. After well washing, nitric acid was added, and heat applied until no more would dissolve. The solution was carefully collected from the residue, evaporated, and weighed, when there were found to be 365 grains of silver nitrate, showing a deficiency of thirty-five grains. This was a decided improvement, and a saving in time as well. The residue left undissolved was again boiled with sugar and alkali, when the whole of it was readily dissolved by the nitric acid with only a few grains' deficiency.

Silver Chloride.—I next tried a silver-chloride emulsion, which contained ten grains of silver nitrate to the ounce. The emulsion had been made for printing-out purposes, and contained both chloride and citrate of silver. The latter was first converted into a chloride by the addition of sufficient salt, and the gelatine destroyed as before. Twenty ounces were taken, and consequently 200 grains of silver nitrate should be looked for. On the addition of the sugar and soda hydrate, as described above, reduction commenced at once, even in the cold. By the time the liquid boiled all appeared to be complete, but ebullition was kept up for fifteen minutes. On washing and dissolving in nitric acid, the whole of it dissolved readily, leaving no sediment, and there was no loss of silver. On trying an experimental lot, consisting of three separate and weighed portions of 100 grains each of silver nitrate, precipitated as an iodide, a bromide, and a chloride, and treating each to the alkaline-sugar reducer, it was found that the chloride was reduced at once, the bromide took longer time, and was not so thoroughly reduced, whilst the iodide was scarcely affected.

To sum up, then, from these results, the easiest and best method of recovering silver from emulsions is to first destroy the gelatine and well wash the precipitate, then convert all into a chloride before attempting reduction. Very much time will be saved, and a better yield given by doing so. The method of doing this is very simple. Allow sufficient water to cover the precipitate, and, by means of a glass tube to the bottom of the vessel, pass into it a stream of chlorine gas, which may be readily generated in a small glass flask. The chlorine will be rapidly absorbed by the water, and will also at once displace both the iodine and bromine from their combination with the silver, and leave a pure chloride behind. The eye is sufficient test for the completion of the operation, for the colour of the silver chloride is pure white, whilst any bromide or iodide gives a more or less yellow colour to it. After washing, the whole may be at once reduced by sugar and soda hydrate, and, if carefully done, no sediment remains behind, and no loss of silver will be found. Even the furnace method will not equal this. A large quantity can be reduced as perfectly as a small, being only governed by the capacity of the boiling utensils, whilst the cost in material and time is very little.

Plates and Cuttings.—Frequently a batch of plates will be coated, and, after drying, will not prove satisfactory, either from fog, or frilling, or lack of density. I understand that, in this case, it is usual to boil off the emulsion, and recover the silver by subsidence, an operation unnecessarily slow and tedious. Spoilt plates should be first soaked in a strong solution of common salt, and then transferred to a bath of dilute sulphuric acid. The hydrochloric acid generated in the film will quickly loosen it from the glass, and it can be readily removed without melting. All can thus be gathered up and drained, when the same method of reduction to the metal and nitrate may be employed as with emulsion.

Collodion Emulsion.—This was treated differently to the gelatine, but was equally simple to reduce. As the object was to recover the ether as well as the silver, twenty ounces of collodio-bromide were placed in a boiling flask, which could be connected with a suitable condensing arrangement. The emulsion contained 300 grains of silver nitrate. Two ounces of soda hydrate were added to it, and also a solution of sugar made into a syrup with water. Precipitation at once took place, and the flask containing the collodion was placed in a water bath, and the temperature of which was gradually raised until the contents of flask were in gentle ebullition. Precaution was then taken, by lowering the gas, to allow of no increase of heat, otherwise boiling over would arise and serious results might ensue. With a little care, however, the operation is quite safe. In about half an hour all the ether had passed over, and the action was stopped. Water was added to the residue, which was now a pasty black mass, and brisk boiling carried on for another half hour, when the precipitate was washed as before, treated with chlorine-water, again boiled with sugar and alkali, and dissolved with nitric acid. The pyroxyline, of course, remained behind, and was treated to several digestions with water to extract all the silver. On weighing the resulting nitrate the whole of the silver was recovered.

Paper Residues.—These may be either collodio-chloride, P.O.P., or argentic bromide, and present considerably more difficulties in the way of reduction. Many of the printing-out papers have a preliminary coating of gelatine and barium sulphate, and this, with the large mass of organic matter in the shape of paper, gelatine, sizing, &c., even when reduced to ashes, makes a bulky mass with only a small proportion of silver present. In this case the best method of recovering the silver at home is to dissolve all out with a strong solution of hypo. This should then be treated with a plate of zinc scoured bright, or a number of strips of zinc would be better. After about twenty-four hours the whole of the silver will be precipitated as an impure metal, being contaminated with both zinc and sulphur. The adhering silver should be brushed off the zinc into the hypo, and allowed to settle, when the black mass should be thoroughly washed in several changes of water, then in weak sulphuric acid, and again in water. Then add the necessary amount of nitric acid, and bring to a boil over the gas. Now dilute with water, and again precipi-

tate with a solution of salt, when a pure chloride will be obtained, which may be readily reduced as before.

An experiment was tried which will serve as a hint to photographers generally, and perhaps draw attention to what must be an enormous waste all over the country. A dozen half-plates, some of which had been exposed and developed, but not fixed, were placed in salt and sulphuric-acid solution alternately, and the loosened films carefully collected, and treated as a sample of emulsion. On evaporating the resulting product, very nearly a drachm weight of silver nitrate was obtained. This would be equal to one and a half ounces of silver nitrate to the gross of half-plates, and yet how many photographers are there who go to the slight trouble of recovering this waste? Of course, if the plates were first passed through the fixing bath, this quantity of silver would not be obtained from them, and it must be looked for in the hypo.

Silver Nitrate.—A few words will, perhaps, be useful as to making the reduced silver into nitrate fit for use in photographic operations. It must be understood that the first solution will have a large excess of acid present, and most probably other impurities, which must be got rid of before it is available for use. This is done by evaporating the acid solution down to dryness, using a very gentle heat for the purpose, or loss will ensue from too violent ebullition of the concentrated solution. The safest way is to employ a water bath until the contents of the evaporating dish are quite dry; then remove from the water bath, and apply heat to the dish by placing over the Bunsen burner a piece of fine wire gauze, and on this the dish. On raising the temperature, a considerable quantity of vapour of nitric acid will be given off, and, finally, the nitrate will fuse and settle down to a clear-looking fluid; now remove from the gas and allow it to cool. In fusing, not only is the excess of acid driven off, but any organic impurity which may have accidentally got into it will be eliminated. When cold, a small quantity of water is added, and the solid, fused nitrate redissolved by heat, the solution filtered and crystallised in the ordinary way. If time will not permit of crystallising, it may be evaporated down again to dryness, and the silver nitrate will be found sufficiently pure for all purposes.

EDWIN BANKS.

OUTSIDE STUDIO WORK.

BETWEEN the ordinary routine of a daily practice in the studio where portraiture forms the chief bulk of the work that has to be accomplished, and that of the operator, who has to undertake work, here, there, and everywhere, of almost every description, there is, indeed, a very wide difference. In the one case the work may be said to assume a purely mechanical form, the successful accomplishment of which, although necessitating a fair amount of thought and attention, is conducted under circumstances of but little doubt as to the most successful method to adopt, both for comfort in working and the certainty of gaining successful results, and is, therefore, by no manner of means to be compared to the difficulties attendant upon an outside operator, who is frequently called upon to undertake work in all sorts of places and under the most trying circumstances.

With the latter it but seldom happens that everything necessary to successfully accomplish the work is forthcoming without recourse having to be had to numerous makeshift arrangements, or the devising of special means to permit of the work being undertaken with anything like fair prospects of success.

As a rule, the general public, within recent years, have come to look upon the practice of photography as a thing of such easy accomplishment, in all places and under all sorts of conditions, that in many instances, where previously it would have been deemed absolutely necessary to send particular articles to a studio for the purpose of having such photographed, now it is generally considered only necessary to send for the photographer, to attend at home or the place of business, as the case may be, and have the work accomplished on their premises instead, without any thought being given to the facilities that exist for the successful accomplishment of the job. No doubt, there are many instances, such as home portraiture, where good business may be done in this line; but, on the other hand, there are innumerable cases where such away-from-home working can only be accomplished under circumstances of great inconvenience and difficulty. Speaking generally, there are always a large number of fixtures, however, that never could be dealt with other than in the positions they occupy. To remove such to a studio would be simply impossible, hence they have to be photographed just where they stand, often under circumstances of great difficulty.

In this class may be mentioned panels, or other large pictures or portraits in galleries, so fixed as to preclude any possibility of photographing in situations other than they occupy. When such are found to be well lighted, the erection of a suitable staging or platform to work from will be the only obstacle to overcome.

It not unfrequently happens, however, that these panels or pictures are found to occupy such positions that a very poor amount of daylight is found to fall upon them, an amount quite inadequate to show up much of the fine detail that, as it were, lies buried out of sight.

It is in cases and under circumstances of these kinds that an outside operator requires all his experience to aid him in securing good results, by devising such means as will enable him to undertake the work by means of artificial light.

To accomplish such, a considerable amount of preparation in the way of stagings is often required, and especially is this the case when the objects are situated in what may be termed outlandish places.

Much of the comfort and success will depend upon the erection of a suitable platform or stage to work from, and a few shillings judiciously expended on such is never thrown away in the long run.

Of the particular form of artificial lighting to employ, much will depend upon the nature of the subject being dealt with. In cases where only a small area has to be illuminated, the employment of two or three good limelight jets will be found very convenient to use. They can be placed in any desired situations without much trouble. In cases where a large surface has to be lighted, such as the entire side of a room, perhaps there is nothing more convenient than a number of good paraffin lamps ranged at various heights and distances from each other. With a battery of eight of such lamps I have secured some exceedingly good results when working in difficult situations. The main factor is exposure. It is not likely any one will at the first attempt just strike the right thing in this respect, but a trial plate will soon lead to the correct timing of the plate.

Any one who has never worked with the aid of such lamps on large areas will be surprised at the amount of detail such a method of lighting yields. I have seen large maps, *i.e.*, some fifteen feet by seven, copied with the aid of paraffin lamps, in which the minutest detail was developed out, detail that was quite startling, and which was hardly apparent to the naked eye. The main factor is to give plenty of time to the plate and develop accordingly.

Lamps are a great boon to an operator when working away from his studio. There are, however, innumerable instances in which movable objects have to be dealt with as well as fixtures, and then comes into play the golden rule which should never be neglected when possible, viz., "Do your utmost to get such moved to a suitable position in the open air." Daylight, no doubt, is the photographer's best friend, and, whenever possible, should be employed in preference to any method of artificial lighting.

The photographing of pictures, for instance, having surfaces that yield trouble in reflection, I firmly believe can be dealt with better in the open air by means of a good diffused light than by any other means of lighting, and I should never hesitate to adopt this method of working whenever possible. It is not always possible, however, to get even movables away from the positions they are found to occupy, and here again comes in no small amount of trouble, necessitating at times a combination of daylight and artificial lighting that is seldom resorted to, and yet very excellent results are obtained by means of such contriving.

The employment of suitable backgrounds is a further point that needs attention. No doubt, in many instances, it is impossible to avoid entirely blocking out the entire surroundings when any one special object has to be dealt with; but, as a general rule, it will be found that more harmonious results are secured where the relief is obtained by means of a properly situated background, hence a few good plain sheets of various colours become an indispensable adjunct to an outside operator's impedimenta. The employment of such saves a lot of labour in blocking out, and well repays the extra labour in moving about the same.

T. N. ARMSTRONG.

DYES AND PIGMENTS IN PRACTICAL PHOTOGRAPHY.

I.

Introductory—Dyes and Pigments in Photographic Papers—Pigments for Carbon Tissue—Ceramic Pigments—Photographic Ray Filters—Dyes for Sensitive Films—Printing Processes in Dyes—Colours for Photographic Positives—Photo-mechanical Inks—Histological Stains—Conclusion.

Introductory.—Colours play so important a part in almost every department of modern photography that a knowledge of the be-

haviour of dyes and pigments is a necessary part of photographic education. Unfortunately, the number and variety of colouring matters now available have had the inevitable result of involving the whole question in such obscurity that the photographer who would know the nature of the materials which he uses day by day is, at the outset, bewildered at the mere mention of colouring materials.

Existing manuals treat the subject of pigments chiefly from the artist's point of view; but in photography there are so many other considerations, some of them of extreme delicacy, that it may be useful, in view of the rapidly extending employment of colours in photographic processes, to consider the subject purely from a photographic standpoint.

Such a treatment, if at all exhaustive, would extend far beyond the limits of even a moderate-sized text-book. The notes offered in the following articles, therefore, will be confined to a brief discussion of the more important considerations which should guide the photographer in the selection of suitable colouring matters in the various branches of his art. For the purpose of greater clearness, the subject will be treated under the separate headings suggested by the different branches of photographic routine. Thus, in the first place, the theory and practice of dyes and pigments in photographic papers will be discussed; then will follow remarks on the pigments used for carbon tissue, ceramic pigments, colours for non-actinic media or ray filters, dyes and pigments useful for dry-plate processes, printing processes in dyes, colours for photographic positives, pigments used in photo-mechanical inks, and histological stains suitable for photo-micrography.

Dyes and Pigments in Photographic Papers.—The chief points to be considered in this case are the permanency of the colour and its possible action on the permanency of the photograph. A great many tinted albumen and gelatine printing papers are undoubtedly dyed with fugitive aniline colours, which rapidly deteriorate when exposed to sunlight. There is less excuse for the use of these dyes now that the more permanent madder colours are to be obtained so cheaply. A simple test for the presence of fugitive colours is based on the assumption that a tint which is rapidly destroyed by light will also be quickly bleached by chemical agents. A small piece of the paper to be tested, therefore, is placed in a dilute solution of bleaching powder, made by dissolving two ounces of the salt in one pint of water and filtering. It is better to control the result by comparison with another piece of paper dyed to the same depth with a fugitive aniline dye. Many photographers may prefer to tint their silver prints after finishing, as then any desired parts, such as the high lights, may be protected from the action of the dye by coating them with collodion or by touching them with a sable pencil dipped in melted wax. The staining can then be done to any required tint. Rich tints are got by successively treating the print with pink madder and Bismark brown solutions. A warm orange tint can be got by using an alcoholic solution of aloes, followed after washing by a bath of dilute ammonia.

In connexion with this subject it may be mentioned that it is an erroneous idea that all aniline dyes are unstable in sunlight. It is true that many of the older dyes of the magenta type are very fugitive, but others, such as the triphenylmethane group, are very permanent.

We come now to the question of coloured mounts used as a support for silver prints. Dark-coloured buff and brown cards very often contain iron compounds. In some specimens water alone will abstract enough iron to give a distinct blue reaction with ferrocyanide solution. The reaction of the paste, which often contains both common salt and an acid, may easily lead to the formation of enough ferric chloride to be most fatal to the permanence of a silver print. Acid mountants should therefore be avoided in the presence of iron compounds. The nature of the pigment in brown mounts may often be determined by soaking the card in water until a sufficient quantity of the pigment drops off as an ochry deposit. This can then be tested for iron by dissolving in hydrochloric acid and adding a drop of sulphocyanide solution, a red colouration denoting iron. Yellow mounts generally contain chrome yellow, a chromate of lead which appears to be quite harmless.

No less important in its reaction on the silver print is the presence of sulphide in the mount. This substance may be present either as a pigment or as the reduction product of a sulphate used as a loading for the paper. The most likely source of this trouble is ultramarine, which contains sodium sulphide, and is often added to paper pulp to secure a pure cold white. It is also a frequent constituent of some green and blue cards. A simple test for ultramarine is to burn the card until all the carbon is consumed, and examine the ash under a magnifying glass for any blue particles, which will be easily distinguishable, both by their colour and by their bleaching on addition of a drop of hydrochloric acid. Any card containing sulphide will show a brown stain if a drop of silver nitrate is placed upon it in the dark. The reduction of sulphate to sulphide may easily occur in the presence of damp organic matter. The white pigment used as loading is generally either calcium sulphate or barium sulphate, of which the former is especially liable to reduction, either to sulphite or sulphide, either of which is very undesirable in the presence of an acid mountant.

Sometimes the pigment used for coloured mounts is of too soluble a nature, and, when pressed in contact with a damp photograph, stains the print. This fault has been noticed in some dark chocolate mounts, but may be readily detected by soaking the suspected mount in water and pressing upon it a piece of white paper.

In addition to the above-mentioned dangers which lurk in certain tinted mounts, a source of even greater trouble is to be found in the bronze powder so often used for the edges. These powders adhere very loosely, and particles, getting detached, readily fall upon the surface of the card. Pure gold leaf would, of course, be harmless, but gold bronzes are often used, which consist of mixtures of copper and zinc. The cheapest mounts are frequently bronzed with aurum musivum, an unstable sulphide of tin, most pernicious to silver prints. A simple test for the nature of the bronze powder is a drop of nitric acid, which at once dissolves metallic bronzes, but does not attack the stannous sulphide. The latter, on the other hand, is dissolved by alkaline solutions, which do not affect the metal bronzes. Pure gold leaf is at once distinguished from metal bronzes by the absence of any action with a drop of nitrate of silver solution. The instability of inferior bronzes is an important consideration also in the selection of gold and silver papers to be used as a support for collodion transfers in reproductions of weapons, armour, or medals.

Hitherto attention has been called only to the influence of those colouring matters which have been intentionally added to the paper for the purpose of securing effects; but photographers have also to contend against other more insidious evils arising from the methods employed in the manufacture of the paper and cards which they use. In the first place the pulp is naturally more or less coloured from the impurities in the ingredients used in its manufacture. To produce pure white paper it is necessary to bleach the pulp. This renders necessary the employment of an antichlor, which, until some short time ago, was almost invariably sodium thiosulphate. The outcry raised by the photographic press against the use of this substance has probably led to its abandonment, at least for photographic purposes. Many photographers, however, prefer to mount their productions upon cards made from unbleached pulp, with an enamelled surface of permanent white pigment.

The suitability of this white pigment depends chiefly upon its opacity or body, as it is technically called. Some white pigments, such as magnesia, transmit more light than they reflect, and are useless in the production of enamel papers; while one of the most opaque white substances known, lead carbonate, is not suitable as a photographic pigment on account of its tendency to darken by sulphurisation in an impure atmosphere. Baryta white, or barium sulphate, is a constituent of many enamel papers, either alone or in conjunction with either kaolin or plaster of Paris. All other white pigments in common use, with the exception of Chinese white, an oxide of zinc, contain variable proportions of lead compounds, and are therefore objectionable for photographic use. A substitute for white lead, which is claimed to have even a greater covering power than that substance, is made by precipitating a solution of zinc sulphate with a soluble sulphide. The resulting zinc sulphide is calcined and stirred at a red heat, and washed when still hot by cold water. The result is an oxysulphide of varying composition, which is not only non-poisonous but is unaffected by sulphuretted hydrogen.*

The question of enamel surface papers loaded with white pigment is of increasing importance in connexion with reproductions from process blocks, as the finest results can only be secured by the careful selection of a suitable paper. White pigments are also employed in the manufacture of artificial ivory surfaces, which can be made by mixing finely divided barium sulphate with gelatine or albumen, and compressing the mixtures into sheets, which are then dried and polished.

Intimately connected with the subject of colours in papers is the tendency to discolouration. Mr. Sawyer has said that the Autotype Company has found it practically impossible to find a paper which does not change its tint by age and exposure to light. This may be due to several causes.

In the first place, it is the practice of some paper-makers to

* Phipson, *British Association Reports*, Dublin, 1878.

correct a yellow pulp by the addition of an aniline dye, the subsequent fading of which obviously causes the yellowness to reappear. Another cause of discolouration is to be found in the use of certain vegetable fibres, such as esparto or wood pulp in the manufacture of paper. It is said that some foreign-made papers and mounts are especially liable to discolouration from this cause. The pulp from these sources is liable to contain portions of the incrusting matter of pine wood, which is well known to darken in sunlight. Rag papers seldom darken. It may be useful, therefore, to mention certain tests which have been proposed for the detection of this evil. The presence of the light-sensitive incrusting matter in paper may be recognised by immersion in an acid solution of commercial aniline, containing—

Aniline	2 ounces.
Hydrochloric acid	3 „
Water	1 pint.

On exposure to the air, a yellow tint appears in the presence of the objectionable substance. The characteristic tints which wood paper assumes with various reagents serve to distinguish it from rag papers. Thus, with orcine a dark red is produced, resorcine and phenol produce shades of green, and phloroglucine a blue violet tint.

The whole question of photographic paper is of the greatest interest and importance. In more than one instance a faulty paper has damaged the reputation of photographic processes for permanence and stability.

J. Vincent Elsden.

PHOTOGRAPHIC WORKERS AT WORK.

VI.—Messrs. B. J. Edwards at Hackney.

"A hive of photographic industry" is a term that possibly not inaptly describes the well-known establishment of Messrs. B. J. Edwards & Co., in The Grove, Hackney. Our pages for very many years past bear witness to the fact that Mr. Edwards is a man of considerable inventive ingenuity, and a couple of hours passed in his society prove handsomely corroborative of the fact.

"This" says Mr. Edwards to us, "is called 'my cupboard.'" We are standing in the private office, and from the said cupboard, whose spaciousness at once excites our envy, Mr. Edwards takes the camera for making photo-chromoscopic negatives that has recently been described in our columns. At first sight the instrument bears the appearance of an ordinary hand camera with a reflector on the top; closer inspection, however, reveals the fact, that, small as it appears, it gives facilities for the simultaneous exposure of the three-colour sensation negatives required by the process. Inclined to the axis of the lens are two silvered mirrors; the first surfaces reflect the images for two of the colour sensations in a vertical direction, dark slides for the plates and grooves for the colour screens being placed *in situ*, while the plate and screen for the third negative occupy the usual position at the rear of the camera. The apparatus, as our readers have already been informed, is adaptable for viewing the positives. The "cupboard" shelters many other evidences of industry which time did not allow us to examine closely.

With a glance at the well-filled and workmanlike workshop of Mr. Edwards, we pass to the laboratory, and in the intervals of a discussion on some aspects of the evergreen subject of development, we have leisure to note the ingenious method of speed-testing adopted for arriving at the sensitiveness of the plates. Another interesting room is that devoted to the preparation of the varnishes, developing, and other solutions, which apparently issue in large quantities from Messrs. Edwards's establishment.

The oft-times asked question as to whether albumen has received its death-blow again occurs to us when we arrive at a large room illuminated by a pale yellow light which is set aside for the flotation of albumenised paper. In answer to a question, we learn that a considerable demand still exists for this printing surface, and that Mr. Edwards includes himself among those, and they are not a few, who think that the manipulative advantages and the quality of the results yielded by albumen paper will assure it considerable use by photographers for a long time to come.

After an inspection of the glass-cleaning room, and other portions of the works, we ultimately find ourselves in the coating room, which is built underground. We have been in many plate-coating rooms, but never in one as "safe" on the score of illumination as that of Messrs. Edwards. The sources of light appear to be placed as far as possible from the emulsion and the coating machine; they consist of gas jets shielded by deep ruby chimneys. Remarking upon the extreme gloom of the coating room, we are informed that Snap-shot Isochromatic plates are to be coated; and, for our edification, a batch is coated, and we have occasion to note with what evenness the emulsion is placed on the glass by the well-known Edwards's coating machine, over twenty of which we incidentally learn are in use by plate-makers in various parts of the world. The coated plates, as is well known, travel on endless bands over water and under ice trays, and, by the time they reach the extremity of the machine, the emulsion is set and the plates are placed in racks for transport to the drying room.

Of late years a new department has been added to Messrs. Edwards's business, namely, the manufacture of light metal, double dark slides, and tripod stands, to both of which we have from time to time referred. The portions of the premises set apart for the evolution of these items of apparatus supply to any one of a mechanical turn of mind most interesting food for reflection.

The presses and tools for such an apparently simple piece of apparatus as a metal double dark slide have to be specially made, and cost, we learn, not without surprise, some hundreds of pounds. Both tinned steel and aluminium are employed for the parts, and to complete one frame no less than forty-three distinct mechanical movements are necessary. The plain sheet of metal is first of all given a certain irregular figure, and then a long series of patterns are employed to turn it into the shape and interrelationship it is to ultimately occupy. Some of these movements we were permitted to observe, and the amount of ingenuity brought to bear in the details of the construction surprised us. In like manner the light metal stands, to which we, only the other day made reference, enter the workshops, so to say, as plain sheets of metal, and are stamped into shape, jointed, enamelled, and finished under the one roof.

Mr. Edwards is confident that his three-colour camera, when it is commercially ready, will not present any great difficulty in working, and he is hopeful of being able to provide a process which will enable the three negatives to be utilised for colour-printing purposes on paper. We finally quit the Grove with the persuasion that the present position of the busy firm of B. J. Edwards & Co. is due to unremitting effort and hard work, which are the secrets of success.

A SIMULTANEOUS PRINTING AND TONING PROCESS.

This is the invention of Messrs. Paul Emil Schoenfelder & Emil Kehle, who state that its object is to provide a chemical compound or composition for the preparation of paper, especially glazed paper, porcelain, or any other suitable material, on which photographic prints are to be made from a negative plate, whereby the toning of the picture is accomplished simultaneously with the printing, and thus the subjecting of the print, after it is made, to a separate toning bath, is fully avoided.

The composition consists of the following ingredients, combined in the proportions stated, and which we will call stock or ground solutions, viz.:—

Stock Solution A.

Collodion.

Pyroxyline	300 grains.
Ether	1 pound.
Alcohol (absolute)	1 „

Stock Solution B.

Fifteen grains of chloride of a metal of the platina class, such as chloride of gold, of iridium, of rhodium, of osmium, of palladium, or of platinum,

Said fifteen grains of chloride being dissolved in half an ounce of alcohol (forty per cent.).

From the stock solution A one and a half ounces is thoroughly mixed with ten drops of stock solution B, and the following ingredients are added in the proportions stated, viz.:—

(*a.*) Three grains of an organic acid, such as citric acid (tartaric acid, formic acid, &c), which is dissolved before mixing with the other ingredients in three drops of alcohol.

(*b.*) Fifteen grains of nitrate of silver, or its equivalent, first dissolved in fifty drops of forty per cent. alcohol.

(*c.*) One and a half grains of a chloride—such as chloride of strontium, or of barium, or of zirconia—dissolved, before mixing with the other ingredients, in three drops of forty per cent. alcohol; and—

(*d*). Two drops of a softening chemical, such as glycerine or castor oil.

The above emulsion is applied to the surface of the material on which the picture or photograph is to be printed.

The surface must be thoroughly dried before using.

After the print has been made, it is given a bath in a solution of hyposulphite of soda, one part to fifteen parts of water, in which bath it remains until all superfluous chemicals have been removed from the picture (about five minutes), when it is taken out and thoroughly washed in clean water.

The picture is then ready for mounting, and does not require any additional toning, as the toning has been accomplished simultaneously with the printing, and it has a superior finish, that will not fade or turn yellow by being exposed to light.

In place of stock solution A, a solution can be used composed of gelatine one part and water three parts, in which case the ingredients mentioned under *a*, *b*, and c are dissolved in water instead of alcohol.

The claims are:—

1. A chemical composition to be used for preparing the surface of suitable material for photographic purposes, consisting of a chloride of metal of the platinum class, of nitrate of silver or its equivalent, a holding substance, and an organic acid, such as citric acid.

2. A chemical composition to be used for preparing the surface of suitable material for photographic prints, consisting of a salt of a metal of the platinum class, of nitrate of silver or its equivalent, a holding substance, such as collodion, an organic acid, such as citric acid, and glycerine or its equivalent.

3. A chemical composition to be used for preparing the surface of suitable material for photographic prints, consisting of a holding substance, such as collodion, a salt of a metal of the platinum class, of nitrate of silver or its equivalent, a chloride, such as chloride of strontium, a softening ingredient, such as glycerine, an organic acid, such as citric acid.

THE W. H. HARRISON FUND APPEAL.

	£	s.	d.
Amount acknowledged last week	79	14	6
Mrs. and the Misses Cook	1	0	0
Dr. Wm. Huggins, D.C.L., F.R.S.		10	0
Dr. Wyld	1	0	0
	£82	4	6

Further donations will be thankfully acknowledged by

FREDE. H. VARLEY, 82, *Newington Green-road, London, N.*

The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

CLEANING OLD NEGATIVE GLASS. (To W. Howard).—If the negatives are not varnished, all that is necessary is to strip them in the ordinary way with weak hydrofluoric acid; this will remove the film, leaving the glass quite clean; if the negatives are varnished, the varnish must first be removed with methylated spirit. W. H. will also find that, if he has any quantity of plates, the films are well worth sending to the refiners for the sake of the silver left in the film.—W. T.

PORTRAIT MOUNTS.—F. H. writes from Cape Town: "Some years ago, when over in England, I came across a new size of photograph mount which I should like to introduce as a novelty; but I have forgotten what it was called. It was about the same length as a cabinet, but much narrower; similar in shape to, but smaller than, the imperial, boudoir, and panel shapes. Can you tell me if it is an article of commerce still?"—No doubt, the "Malvern" is the card referred to. If so, it can most likely be obtained of Marion & Co., or any of the principal dealers.

CLEANING OLD NEGATIVES.—In reply to W. Howard, I do not know that it is the best way, but the following is the method I always adopt for removing old gelatine films, and which I find the quickest and most convenient, as well as the cleanest, I have tried. Prepare a half-saturated solution of alum—that is to say, a saturated solution mixed with an equal volume of water, and add to it hydrochloric acid in the proportion of one drachm to each ounce. Have this in a deep dish, and immerse the plates, without previous wetting, for two or three minutes—more will do no harm. Take them out singly, and, if the fingers be at all tender, rinse off the acid first, and then commence at one corner and, with a sort of rolling, rubbing action, remove the film from the edges of the glass. When it is once well started, it may be peeled off with the greatest ease in an unbroken sheet, leaving the glass beautifully clean. Many plates will peel easily by simple immersion in water, but not all. The alum toughens the film, and the acid loosens it from the glass and renders all perfectly easy; and I have never found any plate, however developed, refuse to part with its film under this treatment.—SYNTAX.

GREEN FOG.—EDER EMULSION says: "I have been experimenting in emulsion-making and for simplicity, and under certain conditions prefer Eder's ammonia-nitrate process. All the text-books state that green fog depends upon the gelatine used. In my experiments I have used twenty different kinds of gelatine in all quantities and at all temperatures, and have never succeeded in getting a batch that does not give green fog with pyro-ammonia developers. I feel convinced that this process is used commercially in such a manner that green fog is avoided, and should be obliged for any hint that you or your readers could give to put me in the right way to avoid this defect."—Perhaps some of our readers experienced in emulsion-making can give the desired information.

CLEANING OLD NEGATIVE GLASS. (To W. Howard).—I find that some brands of plates are much more difficult to clean than others, but fancy that, as a rule, plates that have been coated with a rapid emulsion are the easiest to manage. Sandell plates are certainly the most difficult. A plate cannot be cleaned unless the film has had a long soaking. I find the best way is to put a number of plates in the developing sink, cover them with a hot and strong solution of washing soda and soap, and leave them all night. In the morning the films, in most cases, can be easily rubbed off with a piece of flannel, and any that will not yield to this treatment are not worth troubling about. Slight traces of gelatine will be left adhering to the glass, but they can be cleaned off with flannel and a little sapolio or sunlight soap. A final rinsing in dilute nitric acid is desirable.—C. WELBORNE PIPER.

CURIOUS EFFECT OF ALUM.—J. B. E. says: "Having run out of ordinary alum a few days ago, and having by me some crystals labelled 'iron alum,' I used some of these instead in making up a 'hardening' bath for some freshly developed negatives, as I was under the impression that all the alums possess the property of hardening gelatine. To my surprise, on treating the first negative, the image almost entirely disappeared, leaving nothing but a faint yellow stain where it had been. Needless to say, I did not repeat the experiment. The salt is something like ordinary alum, in the shape of crystals, but a brownish-red colour, and quite without smell. Can you give any explanation as to what it is?"—The salt is, no doubt, what it purports to be—iron alum. In this case, most probably the ammonia compound, the sulphate of iron and ammonia (ferric). Our correspondent is quite right with regard to its hardening properties upon gelatine, but he reckoned without its solvent action on metallic silver, which was the reason of the disappearance of the image.

REPRODUCING NEGATIVES.—I think the following plan will meet the requirements of J. Hastie. Select a good sample of Rives' albumenised paper and float it, reverse side downwards, on a fifty or sixty-grain bath for a somewhat longer time than would be necessary for ordinary purposes. For ordinary printing what is required is to keep the image as much as possible upon the surface of the albumen, in order to secure brilliancy, and for this purpose a short floating is best; but, for our present requirements, a better result accrues from the formation of the image in the body of the paper. Consequently the latter is floated on its back for a long enough period to draw the chloride from the albumen into the pores of the paper. Four or five minutes will usually be sufficient. The printing may be done upon either side of the paper, but if from the albumen side there will be scarcely any surface image. In any case, however, the printing must be judged by transmitted light, so that the surface image is of no importance. Print very deeply, until the highest lights are tinted, wash and fix in clean hypo without toning. The image *may* be toned, if that course be preferred; but it is a needless expenditure of gold. In that case the printing need not be carried quite so far. When fixed, wash well, dry, and, if rapidity of printing be desired, apply wax, oil, or vaseline, to the back of the print, which at this stage should appear on the surface hopelessly over-printed, but show a strong clear image by transparency. Now repeat the operation, using this print as the *cliché*, and the result will be a negative that is printable from either side, and, if properly done, will give proofs scarcely, if at all, inferior to the original.—SYNTAX.

Our Editorial Table.

Photographic Amusements.

By Walter E. Woodbury. New York: The Scovill & Adams Co.

Mr. Woodbury acknowledges his indebtedness to a variety of sources for the contents of this entertaining volume, which sets forth, so to say, the art and mystery of trick photography. Multi-photography, spirit photography, silhouettes, caricature photographs, distorted images, freak pictures by successive exposures, artificial mirages by photography, composite photographs, and "doubles," are only a few of the subjects dealt with. We can fairly say that the book well redeems its title, and supplies a fund of amusement in producing, to quote Mr. Woodbury, "a number of novel and curious effects that can be obtained by the aid of the camera." For all that, we beg to be allowed to demur to the inclusion of telephotography, lightning photography, instantaneous photography, direct positives in the camera by the thiosinamine process, and the hydrofluoric acid method of enlarging, in a volume avowedly compiled to entertain and amuse. They strike us as being uncommonly serious branches of photography. However, the book is very well illustrated, and, on that and other grounds, much may be forgiven it.

Sample Books of Carbon Tints.

Thomas Illingworth & Co., Willesden Junction.

Messrs. Illingworth send us a book of sample tints used as specimens for their carbon enlargements, which they are issuing to their customers. The prints, as such, are admirable examples of the process, and the idea of so issuing them is both good and novel.

The "Shashin-Sowa" Photographer's Pocket Book.

The Shashin-Sowa, Tokyo.

Our contemporary has issued a neat little pocket note book. Space is provided for photographic memoranda, and probably a great deal of information on photographic matters is given—in Japanese. However, there are occasional oases in the desert, for here and there we come across lists of chemicals, diaphragm numbers, and so forth, which warrant the assumption that the information is really and truly photographic. We welcome, even if we don't wholly understand, the latest photographic note book.

Exposure Tables for Photographers in India and the Far East.

By George Ewing. Calcutta: Thacker, Spink, & Co.

Mr. Ewing's contributions to our contemporary, *The Journal of the Photographic Society of India*, are always marked by undoubted practical knowledge; and he has evidently been at great pains in compiling the tables in this book. They are calculated for the various months between N. latitudes 30° and 23°, and for near the equator, and should be useful to eastern photographers, as they are obviously the outcome of much conscientious work.

Rouch's Eureka Hand Camera—Half-plate Size.

W. W. Rouch & Co., 161, Strand.

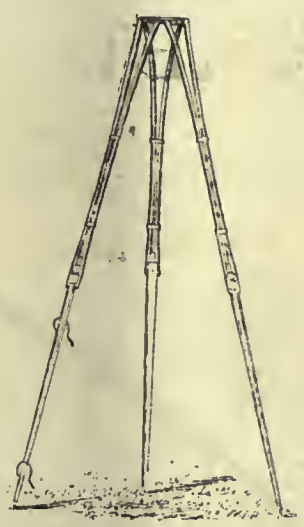
There evidently exists a demand for hand cameras constructed to carry plates larger than quarter-plate size, for Messrs. W. W. Rouch & Co. are introducing a half-plate hand camera on their well-known Eureka design, and have submitted it to us for inspection. When closed, its dimensions are 9×7×6—a by no means large size. It is beautifully made in mahogany, and, if occasion arises, it can be used on a stand, as it takes dark slides and a focussing screen. Ordinarily, however, it is fitted with the firm's Eureka changing back, which has been favourably known for several years. The lens is a rectilinear of 7½ inches focus, and a Thornton-Pickard time and instantaneous shutter is employed, the speed of which is regulated from underneath the camera, the speed dial showing on the top. The release is effected by pressure upon a metal pin, and two bright finders are fitted to the camera, which is focussed by means of a milled-head screw adjustment, a focussing scale being affixed to the side of the instrument. The half-plate Eureka has been in successful use for some time. It is a thoroughly useful and well-made instrument and deserves to be popular.

The Manx Stand.

The Sciopticon Company, 10, Highbury-quadrant, N.

Many of our older readers will learn, we are sure, with interest that the Sciopticon Company, of which the late George Smith (a name once very prominent and respected in photographic circles) was the moving spirit, are continuing the preparation and sale of the special productions for which it has been long noted. We observe, from the catalogue before us, that a lengthy list of slides by the incomparably beautiful Woodbury process is given, and that the Sciopticon lantern, the Woodbury photometer, and many other useful items are described.

The Manx tripod stand, here illustrated, has ever been a favourite with tourist photographers, and well merits that favour. Fully



opened, its height is 5 feet; closed, the measurement is 2 feet 8 inches, its weight being only 1½ lbs. When drawn out, the brass holders (shown) secure it in position, and impart to it very great rigidity. Its lightness, rigidity, and simplicity of construction constitute the "Manx" stand an ideal addition to the apparatus of the tourist photographer.

Catalogues Received.

Louis Gandolfi, 752, Old Kent-road.

Mr. Gandolfi devotes himself to the manufacture of cameras and other items of photographic apparatus, which, from his list appear to be good and cheap.

Harrington & Co., 66, King-street, Sydney, N.S.W.

We do not remember to have seen before, a photographic dealer's catalogue from "down under," and, on turning over Messrs. Harrington's well-printed volume of 192 pages, we realise how much antipodean photography depends upon home products, most of the goods mentioned in the catalogue emanating from the old country. This, however, by the way. The catalogue contains much useful information on technical subjects, and in other respects is an excellent production, which is, doubtless, much appreciated by Australian photographers.

W. I. Chadwick, 2, St. Mary's-street, Manchester.

Mr. Chadwick's newest list is devoted to radiography, for which purpose illustrations and prices of coils, vacuum tubes, fluorescent screens, &c., are here set forth.

Newton & Co., 3, Fleet-street, E.C.

Messrs. Newton, as is well known, have specially addressed themselves to the supply of radiographic apparatus, and their list deals with tubes, coils, screens, and other requirements of the "new" photographer.

Ausführliches Handbuch der Photographie.

(2 Auflage. Siebentes Heft. II. Band, 2 Heft.)

Dr. Josef Maria Eder. Wilhelm Knapp, Halle-a-S.

This volume of Dr. Eder's complete guide to photography deals with the wet-collodion process in all its branches, including ferrotype and

the production of negatives for process work. It is characterised throughout by Dr. Eder's thoroughness and wide research. The book will be of especial value to the process-worker, giving, as it does, the scientific principles involved in the use of the screen and stops of different forms. Short practical rules are also given for their use.

Künstlerische Photographie.

By J. Raphaels. Ed. Liesegang, Düsseldorf.

This work may be compared to some extent with Dr. Emerson's noteworthy treatise on Naturalistic Photography, and may probably attain an analogous position in German photographic literature. The author's standard is, that a photograph, for other than scientific purposes, should give an impression to the eye similar to that produced by a copy of a true work of art. In other words, photographs should resemble photogravures of paintings of the highest order. The writer not only treats of the æsthetic side of the subject, but, in the second division, enters into the technical, and, unlike Dr. Emerson, recommends the photographer to avail himself of the many devices by which negatives and prints can be modified to suit the desired end. The book has for frontispiece Dr. Emerson's well-known picture, the East Anglian study of *Ploughing*.

Die Zinkätzung.

By Jacob Husnik. A. Hartleben, Vienna.

A second edition of this work has just been published, and the clear and systematic treatment of the subject cannot but add to the reputation of the author as a teacher and craftsman. The first part deals with the history of chemical engraving, and describes in a lucid manner the various processes involved in photo-zincography. The second part treats of the various tools and materials employed. In this edition the author includes descriptions of the different routing machines, which now play an important part in this branch of work. There are also some illustrations showing the capacity of zincography as a graphic art. It is a valuable guide and reference book to those engaged in this branch of photo-engraving.

News and Notes.

Royal Photographic Society.—Technical Meeting, Tuesday, June 23, at eight p.m. A *Practical Demonstration of Colour-screen Making and Testing*, by Mr. F. E. Ives.

Leytonstone Camera Club.—A Cycling Section having been formed in connexion with this Club, it has been decided to admit all persons joining as members on or before the annual general meeting, June 24, without entrance fee. Annual subscription 5*s*.

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, June 24. Subject for discussion, *Toning Silver Prints*. Visitors are always welcomed by the members.

The New Photography.—Tylar's light-tight bags are being supplied in large quantities, both to the professors at home and on the Continent, for containing plates and films for radiograph experiments. When used with a celluloid film, they can be bound round a limb, giving closer contact and better results.

The following are the awards in the competition for negatives on "Gem" Portrait Plates by professional photographers: 1st prize, Miss Gertrude Reston, The Studio, Stretford, Manchester; 2nd, G. E. Stone, 25, Farringdon-street, New Swindon; 3rd and 4th, divided between B. T. Ord, 38, Derwentwater-road, Gateshead, and W. Hillman, South-beach Studio, Pwllheli.

In a late paper in the *Comptes Rendus* on the products of combustion of an acetylene burner, and explosive mixtures of acetylene and air, M. M. Grehant states that the combustion of acetylene gas in an ordinary fishtail burner is complete, the products not comprising the least trace of a combustible gas containing carbon. With mixtures of acetylene and air, the most violent explosion was produced when the volume of air was nine times that of the acetylene.

"For nearly half a century," says the *Chemical News*, "there has been an active search for a true method of photography in colours—some process for obtaining at once, without any "hand-work" etching and the like can produce on the sensitive plate, the reproduction, *e.g.*, of a sunset sky in its natural colours, and which shall not be liable to fade. The very fact that, after thousands of experiments, we are little, if any, nearer the mark than in the days of Fox Talbot—the very fact of such prolonged failure is discouraging, and no less so are the attempts at obtaining coloured results in a roundabout and partially mechanical manner. Nevertheless, hope and effort should not be abandoned. Some day objects may be reproduced by a pure photo-chemical process, and we may then bow the hand work out of court."

At the Reception in aid of Guy's Hospital at the Imperial Institute, on Wednesday, June 10, a demonstration of the X rays was given by Mr. Le Conteur and Messrs. Houghton & Son, with apparatus supplied by the latter. A very successful negative was taken of the hand of H.R.H. the Prince of Wales, who took great interest in the apparatus, this being the first time he has seen a demonstration of the Röntgen rays. Messrs. Houghton & Son had five complete apparatus at work, and Mr. Joyce, of Oxford, Mr. Gray, and Mr. Martin were all present with apparatus.

"Dr. Baraduc has been describing, before the Paris Medical Society, his system of photographing thought. The images which he obtained," says the Paris correspondent of the *Daily Telegraph*, "are as vague as his theories, and give rise to a good deal of comic criticism. The erudite physician says that, by the aid of his hand or his forehead, he can project his thoughts or ideas on a photographic plate in the dark. The reproduced figures which he showed as the results of his experiments were clouds, dim human forms, a sort of cavern, and a heart, the latter being the iconographic outcome of the emotions experienced by the doctor, who is evidently pious, after he had been visiting the Church of the Sacré-Cœur at Montmartre. With the help of electricity, he also obtained other effects, but he maintains that this force is unnecessary when the person who wishes to project his thoughts on a plate is a being of poteut imagination and resolution. Further explanations of the doctor's theory must be awaited before any judgment can be pronounced on the value of his thought pictures."

Hair Lines and Friction Marks on Bromide Paper.—We have lately several times had occasion to answer questions with regard to the removal of the fine hair lines and friction marks which occur on the surface of bromide papers, and especially of Nikko paper. These marks may be caused by the friction of one sheet over another when withdrawing them from a packet, or they may be caused by rubbing the finger or nail accidentally over the sensitive surface. The harder and more smooth this surface, the more easily are the marks produced. Fortunately their removal is a very simple matter, as they are entirely on the surface. The developed, fixed, alumed, and washed prints must be allowed to dry. Then soak a piece of cotton-wool in water (or methylated spirits, though this does not work quite so quickly), and squeeze it out. Proceed to wipe over the surface of the print with the damp cotton-wool firmly but not too roughly. Do not have your cotton-wool too wet, as this does not work so well. Finally wipe the whole surface over with a wet clean pad of cotton-wool. When dry, the prints will be found to be spotless and perfect.—*Kodak News*.

Many are the uses to which the Röntgen rays may be put. It has, however, been reserved for Miss Frances Willard, a bright and shining light of transatlantic temperance, to promise the enrolment of the X rays beneath the banner of militant teetotalism. One has heard, says the *Graphic*, of the Awful Warning, that is to say, the reclaimed drunkard who thrills a teetotal audience with the recital of his past alcoholic achievements. It seems that the Awful Warning will now have an even more favourable opportunity of working for the cause. It is proposed to utilise the X rays "for revealing the process of deterioration as it develops, drink by drink, in the drunkard's stomach." This should be, from the spectacular as well as from the scientific point of view, a very remarkable experiment, but it occurs to one that it will take rather a long time to perform. The process of deterioration as produced by a succession of single drinks, is not rapid, and the subject of the experiment will have to take a good many before he gets perceptibly "furtherer" in any sense of the term. Nevertheless, the Awful Warning will have an uncommonly good time; and it is pleasant to think that, if ever the Awful Warning succumbs to the effects of his zeal for temperance, there will be no lack of candidates for the reversion of his position in front of the camera.

"Ruling Diffraction Gratings.—'Rowland's grating' is made by ruling parallel lines on a concave plate of what is known as speculum metal. This metal," says *Appleton's Popular Science Monthly*, "is an alloy of two parts copper and one part tin. The parallel grooves are made with a delicately adjusted diamond point. The machine on which the grating was made was manufactured after eighteen months' hard work by Theodore C. Schneider, the machinist at Johns Hopkins University, from the designs of, and by processes invented by, Professor Rowland, who was constantly at hand to direct every movement. This machine is in a dark vault under the laboratory. When a 'grating' is being made, it runs night and day. The vault is locked, and no one is allowed to enter it, for the machine is so sensitive that the temperature of a human body would disarrange it. When a new diamond point is being tested, as is now the case, Professor Rowland will permit a few people to visit it. Sir William Thomson, the Earl of Rosse, Lord Rayleigh, Professor Ball, Astronomer Royal of Ireland, the late Professor Helmholtz, of Berlin, Professor Mascart, of Paris, and Professor Lemstrom, of Sweden, are among those to whom this courtesy has been extended. The motive power of the machine is an hydraulic engine. The water is kept at a constant height in a tank near the roof, to ensure unvarying speed. It is driven by a belt attached to a solid brass driving wheel on the machine. A crank is turned by the same on the other end of the shaft. This crank moves the carriage that conveys the diamond point back and forth over the surface of the 'grating' or plate. This carriage rests on two steel ways, which are flat on top and slanting slightly outward, so that there are three points on one way or rail on which the carriage rests. These 'ways' are ground so as to make them as nearly accurate as possible; but they cannot be made perfect, for Mr. Rowland tested them with a microscope and found that they were 'out'—that is, not exactly perfect—by one fifty-thousandth of an inch. He did not attempt to improve them."

Tesla's New Light.—The *Philadelphia Public Ledger*, of May 21, contains the following interesting item of news: It is announced that Nikola Tesla has solved the problem which he set before himself many years ago, and which may revolutionise the system of electric lighting. It is, electrical experts say, the nearest perfect adaptation of the great force of nature to the use of man. In Mr. Tesla's laboratory in Houston-street is a bulb not more than three inches

in length, which, when the current is turned into it, becomes a bulb of light. With it a very large room is so lighted that it is possible to read in any corner. Yet this is done without the attachments necessary in existing lights. The rays are so strong that the sharpest photographs may be taken by them. No new dynamo is required to produce the current. There is no danger of harmful shock in its use. Stories have come from time to time from Mr. Tesla's laboratory that he was experimenting on a light of this sort. Rumours of success and failure have followed each other, and Mr. Tesla's friends were inclined to doubt that he would succeed. A half dozen times the discovery was on his finger tips, only to elude him, but now he has told his friends of his success. Mr. Tesla has been working for many years on his theory of the necessity and practicability of the conversion of electricity. The present incandescent light gives only three per cent. of illuminating power; the other ninety-seven per cent. is wasted in heat. In accordance with his theories, which have been already applied successfully to the economical transmission of the electric fluid, he applied himself to the saving of some of this wasted energy in electric light. The bulb which he has perfected gives ten per cent. of light, and loses ninety per cent. of energy. Mr. Tesla declares that he will, with the aid of a few more experiments, be able to produce forty per cent. of light, so that the waste will be reduced to only sixty per cent., or thirty-seven per cent. less than at present. The principle of the light is vibration. The illumination is secured by means of what Mr. Tesla terms a vibrator within a bulb, which holds the vibrating needle within a vacuum. The needle vibrates so rapidly that the figures per second sound imaginary, but it is this intensity of energy which gives the light its brilliancy and its apparent steadiness. The lights do not have to be renewed.

Proportion, as Applied to Enlargement and Reduction.—Professional photographers when giving orders for enlargements are not at all times sufficiently definite in their instructions to the enlarger to enable him to carry out their wishes exactly, and it is found out, when too late, that the result is not quite what was expected. Disappointment is often experienced through the inability of the photographer to sufficiently allow for the difference in the proportions of the original to the enlargement. For instance, an order for a 12×10 enlargement is given, to be made from a cabinet print, and all the subject is to be included. The order is executed and dispatched, when, forthwith, a complaint is made that the enlargement measures only 12×8¾ instead of 12×10, and it is, therefore, of no use, as it was wanted to go into a frame already made, having a mount with an opening 11×9. To prevent these disappointments, I purpose here to point out a way by which any one may know exactly what proportions any print or negative will have when enlarged. Suppose, for instance, it is required to enlarge a cabinet portrait to 12×10, proceed, first of all, to measure off the full size of the cabinet print (5½×4) on a piece of paper. Now draw a diagonal line from the left-hand bottom to the right-hand top corner, continuing the line for about 16 inches; then, from the left-hand bottom corner, continue the vertical line to exactly 12 inches high, and from this point draw another line at right angles till it meets the diagonal line; a measurement of this line will show the width given by the cabinet print when the height is enlarged to 12 inches, viz., 8¾ inches. This explanation may appear somewhat complicated, but it is in reality very simple, and is easily proved by following this example on paper. It applies to any size and proportion. In the *Photographic News Year-Book* for 1880 I gave a further application of this principle, which is illustrated. It is termed "A Measuring Mask;" the whole thing is very simple, and any one could make them with a few sheets of thin cardboard. The great advantage of these masks is, that the opening, when adjusted to the desired height, will, at a glance, show the true proportionate width that will be included in the enlargement. For cabinet-sized negatives the openings need not be larger than 6×5, which will, of course, answer as well as 12×10, and be more easily handled. It will be obvious that a mask will be required for sizes that do not bear the same proportion to 6×5. A mask, for instance, with an opening 10×8, will also suit for 15×12 and 20×16, as the relation in each case is as 5 is to 4. The proportion of 6 to 5 will suit for 12×10, and 18×15, and 24×20, because they are in the proportion of 6 to 5. It will thus be seen that a large number of masks will not be required to take all the usual sizes. In copying a painting, it is sometimes useful to know what the width of it will be when the base line is reduced to any given length. Stretch a thread diagonally across the picture from opposite corners. Mark the required base line, from the lowest end of diagonal, along the bottom edge of painting; then, with another piece of thread, with a weight at one end, plumb right over the mark. The point where the threads cross will always be the proportionate width.—H. J. Burton, in *Autotype Notes*.

Patent News.

The following applications for Patents were made between June 3 and June 10, 1896:—

Apparatus.—No. 11,909. "Improvements in Photographic Apparatus." Complete specification. A. E. Dehnert and K. H. G. Hedwig.

Lanterns.—No. 12,005. "Improvements in and relating to Magic Lanterns." R. Ehrlich.

Shutters.—No. 12,048. "Improvements in Photographic Shutters." G. J. F. M. Mattioli.

Embossing Photographs.—No. 12,182. "An Improved Method of Backing Embossed Photographs, Prints, Cards, or other Embossed Articles." H. Piquet.

Lenses.—No. 12,219. "Improvements in Lenses." P. Rudolph.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
22	Bradford	*Choice of Apparatus, Selection of Subject, Use of Swing Back, &c., and Exposure.* Walter Booth.
22	North Middlesex	*Observations on Picture Making.* F. C. Tilney.
23	Ashton-under-Lyne	Exhibition of Views of Lichfield Cathedral.
23	Birmingham Photo. Society	*Architecture.* Charles Morgan.
23	Hackney	Discussion on Printing.
23	Royal Photographic Society	*A Practical Demonstration of Colour-screen Making and Testing.* F. E. Ives.
24	Leytonstone	Annual General Meeting.
24	Photographic Club	Toning Silver Prints.
25	London and Provincial	Annual Meeting.
27	Ashton-under-Lyne	Excursion: Middlewood, for Poynton Pool. Leader, Miss Marsland.
27	Borough Polytechnic	Excursion: Ealing and District.
27	Croydon Camera Club	Excursion: Epsom Downs Station, for Headley, &c. Leader, A. W. Hirst.
27	Croydon Microscopical	Excursion: Staines and Chertsey. Leader, Mr. Lincoln.
27	Leytonstone	Excursion: Billericay. Leader, Dr. W. P. Turner.

ROYAL PHOTOGRAPHIC SOCIETY.

June 16,—Photo-mechanical Meeting,—Mr. T. Bolas, F.I.C., F.C.S., in the chair.

Mr. E. Sanger Shepherd read a paper on

Collodio-bromide and Transparencies for Photogravure.

Transparencies for photogravure, he said, must possess the greatest range of gradation, and must not be too dense, and, when a negative would yield such a transparency in autotype tissue, that method was the most suitable. In the case of flat or over-intense negatives, however, or when it was necessary to alter the size, the best means of obtaining a transparency was by the use of collodion emulsion. He preferred an unwashed emulsion, with an excess of bromide, with which the coating could be effected in a fairly bright yellow light, the plate being afterwards washed in a safer light. To make ten ounces of emulsion he gave the following formula:—

Silver nitrate	250 grains.
Water	2½ drachms.

Dissolve by heat and add

Absolute alcohol	2½ ounces.

Then put into the stock bottle

Pyroxyline	50 grains,
Ether (·770)	5 ounces,

and add the silver solution as above.

The bromising solution was

Zinc bromide	200 grains.
Alcohol	2½ ounces.

After coating, allow the emulsion to become well set, and then plunge the plate into cold water and leave it until all greasiness has disappeared. Expose about the same as for wet collodion and develop with pyro and ammonia, as recommended by Mr. Brooks. For ordinary subjects, the best intensifier was pyro and silver, but, for line work, the lead intensifier was to be preferred. For line work in photogravure, there should be a very small amount of dust grain on the plate, and, where there were large black masses without detail, these should be allowed to take care of themselves in etching, being worked up afterwards, by which means the character of the fine lines was preserved. In very delicate work it was necessary to use a very fine grain and plenty of it, but, with coarse subjects, it was possible to employ two grains, first with bitumen and then with resin. He never used a substratum, and found that a narrow edging of indiarubber solution was quite sufficient to keep the film from slipping. In developing, the image should be kept as thin as possible, the requisite density being obtained by intensifying with pyro and silver for half-tone subjects, or with ferricyanide of lead for line work, treatment with sulphide of ammonium producing a deep black, which would not print through in several minutes' exposure to sunlight. The addition of a few minims of alcoholic solution of erythrosine to the emulsion rendered it possible to obtain excellent copies from originals on yellow paper, and, in cases where the originals were on paper tinted with aniline dyes, the colour could be removed by washing in water.

Mr. W. E. Debenham asked whether it would not be possible to obtain a suitable carbon transparency from a weak negative by means of intensification with permanganate of potash?

Mr. Shepherd said a suitable result could be obtained in that manner, but the final effect of intensification with permanganate was so much greater than the visual effect that it was extremely difficult to tell when the requisite degree of intensity was reached.

Mr. Debenham had found that, after treatment with the lead intensifier, a collodion film had a great tendency to crack in drying.

Mr. Shepherd said that, if the image was very thin and thoroughly fixed with hypo, he had never had any trouble.

Mr. F. E. Ives had made a very large number of collodio-bromide positives, and for line subjects had always intensified with copper bromide and silver, and, judging from the specimens shown by Mr. Shepherd, he thought this method was better than lead intensification.

Mr. DEBENHAM suggested that the water used for dissolving the silver in the emulsion would have a tendency to cause frilling, and

Mr. IVES said he had always been afraid to use any water, and it was quite possible to get the silver in without it.

The CHAIRMAN, alluding to the question of intensification, remarked that it was an interesting fact that a collodion-emulsion plate could be exposed and fixed without development, clear glass resulting, the image being entirely obtained by means of intensification with pyro and silver, although previous to intensification the image was quite invisible.

The ASSISTANT SECRETARY (Mr. Child Bayley) said he had used Schering's celloidin for washed emulsions, and found it so satisfactory that he would now use nothing else, the only objection being that it required at least twelve hours to dissolve. Mr. Shepherd had said that he kept his emulsion bottle in a tin box, to preserve it from the light; but he (Mr. Bayley) had never found that collodion emulsion in bulk was sensitive to light, and he showed a sample which had been kept on a shelf in an ordinary room for about two years without being affected. He asked Mr. Ives what form of bromide he used for an emulsion made without water?

Mr. IVES replied that with 95 per cent. alcohol, bromide of cadmium, sufficient time, and plenty of heat, he always succeeded in getting the requisite amount of silver dissolved; he made up the emulsion and let it stand for a few hours with excess of silver, and then added more bromide of cadmium and alcohol to neutralise the free silver.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 11. Mr. Thomas Bedding in the chair.

The HON. SECRETARY read a letter from Mr. Atkins, resigning his office of Hon. Recorder, in consequence of his removal from London. After expressing his appreciation of Mr. Atkins's labours, he proposed that he be elected an hon. member of the Association, as a token of its esteem, which was seconded by Mr. Henderson and carried unanimously, and suitably acknowledged by Mr. Atkins. The Hon. Secretary drew attention to a photogravure of Dr. Obermayer, by himself, in the *Journal* of the Vienna Camera Club, as an example of work by a spectacle lens.

Mr. J. E. HODD asked for opinions as to certain comet-like marks on a negative which he produced, and which was one of a dozen exhibiting similar defects. Amongst other suggestions were that the wrapping paper might have caused it, or packing face to face, while Mr. Hodd thought that during washing some particles driven from the tap at high pressure might have been forced into the film. Eventually Mr. Henderson subjected it to some experiments, but nothing definite was heard as to the cause.

PLATES FOR HAND-CAMERA WORK.

Mr. W. D. WELFORD opened a discussion on this topic by asking who uses quick plates for hand-camera work—in other words, Why use rapid plates when slow ones will do as well? It is constantly advocated that rapid plates be used, and he had been attacked for advising the use of slow plates. He had always held that rapid plates were more difficult to develop than slow plates, but this was often denied. In the next place, greater precautions must be taken as to the safety of the dark-room light. He claimed that there was less latitude in exposure, too, with fast plates, and one had to more nearly hit the mark compared with slow plates. Then, of course, there was the question of expense. He preferred slow to rapid plates, provided they were fast enough; and, further, he liked a slow plate with an energetic developer better than a rapid plate with a slower developer. Most hand cameras were generally worked too fast, and for which he could see no necessity. He thought exposures of from $\frac{1}{4}$ second and upwards were very useful; but, if great speed was required, some shutters are provided up to $\frac{1}{100}$ second. If he were going to work at such a speed, however, he would drop a hand camera altogether and use a stand camera. That the speed of the shutter is much too great could be verified by considering that most people with any experience could make an exposure up to two seconds with a hand camera, while an ordinary worker should certainly be able to give up to $\frac{1}{2}$ second. By slowing the shutter and adopting slower plates, he was sure much improved results would follow. He exhibited some of his own work, all, with one exception, being taken on ordinary plates, that is, of the first rapidity, and answering to Ilford ordinary. They were mostly taken with stop *f*-11, and some with *f*-16.

Mr. HENDERSON inquired what "Warnerke" speed this slow plate was to be?

Mr. WELFORD replied, Seventeen or eighteen.

Mr. HENDERSON called that a quick plate.

Mr. HODD endorsed most of Mr. Welford's remarks. All his work had been done on a slow medium plate. A fast plate was really very unsuitable for making enlarged negatives from, on account of the general coarseness of grain. He had some whole-plate enlarged negatives from these slow plates which required a sharp eye to discern that they were enlargements at all. Fast plates presented much difficulty in getting shadow detail, and there was less latitude. He did not understand why hand cameras were not suited for very rapid work.

The HON. SECRETARY felt bound to say he was inclined to take the other side, and support those misguided individuals in favour of rapid plates. The arguments used were very antiquated and showed a lack of appreciation of the efforts of plate-makers. That the rapid plate is more difficult to develop, that it gives less margin of error in exposure, that it induces coarseness of grain, and, consequently, is unsuitable for enlarging from, and that it is more susceptible to fog, may have been true years ago, but good rapid plates, with little grain, and which do not fog in ordinary working light, are now easily obtainable. This plate was of a speed of about 80 Hurter & Driffield, which was a rapid plate, and should not be classed with the plate advocated by Messrs. Welford and Hodd. He thought the tendency was towards under-exposure. As regards choice of stop, a great deal depended on the subject. For near figures, *f*-11 to *f*-16 were not very suitable, if you also want definition in the background. He thought the question of holding hand camera steady for an exposure of two seconds out of the question, and found it difficult enough to get sharpness with $\frac{1}{10}$ second.

Mr. HENDERSON agreed with the Secretary as to rapid plates being superior, and instanced one or two of Mr. Welford's examples that would have been better for a rapid plate.

Mr. RAPSON maintained that a better negative could be obtained from a forced, barely exposed, slow plate than from a rapid plate, over-exposed, with tentative development.

The HON. SECRETARY suggested that it would be well to compare fast and slow plates, to ascertain whether there was any truth in the contention that slow plates gave more gradation than fast plates.

The CHAIRMAN remarked that he had not been very successful in long exposures with hand cameras. About the grain of plates, even visually the grain varied considerably. As regards the main question, he would prefer a slow plate.

Mr. WELFORD had not touched the question of granularity, because very little argument could be founded upon it. He disagreed with the Secretary's opinion as to there being more under-exposures. Very little over-exposure of a rapid plate caused much flatness, and, moreover, it was exceedingly difficult to restrain a rapid plate when over-exposed. He advocated a stand for very fast work on account of the great vibration caused by rapid shutters, and by this means avoided it considerably. With reference to protracted exposures, there was nothing to prevent one from leaning against a tree or other support, and in this way two seconds could be easily given.

PHOTOGRAPHIC CLUB.

THE usual weekly meeting of the Photographic Club was held at Anderton's Hotel on Wednesday evening, June 10, Mr. Welford in the chair.

The HON. SECRETARY read a letter from Mr. Alexander Cowan, thanking him for the sympathetic letter which he had sent on behalf of the Club, and stating that he was getting along as well as it was possible to do under the circumstances. The Hon. Secretary handed round prospectuses and entry forms of the Bristol International Photographic Exhibition.

Mr. NESBIT showed negatives, made by his son and developed by himself, of the snake-keeper at the Zoological Gardens, with one of his pets encircled round his neck. Mr. Nesbit took the opportunity of thoroughly abusing those dry-plate makers who sent out plates which were badly cut. He said that, in a dozen $8\frac{1}{2} \times 6\frac{1}{2}$ plates recently purchased by him, six of them were too small, and he naturally felt aggrieved.

It was pointed out that, as these plates were whole-plates, it was probably the fault of the glass-manufacturer rather than the dry-plate manufacturer.

Mr. NESBIT said he did not care whose fault it was; when he bought plates, he wanted them to fit his slides.

Mr. Welford passed round some prints made on Eastman's matt Solio paper toned to a sepia colour. He used the Eastman platinum toning formula.

Mr. STRETTON said that, in connexion with the Club's proposed outing, Mr. Gotz and he had, amongst other places, been to Windsor, and, taking all things into consideration, their suggestion was that the Club should select that locality for its proposed day's outing. He suggested that the day might be changed to July 4, because in that case he could arrange to have his boat at Windsor, and the members would be able to make pictures from both sides of the river. He said that he was acquainted with the district, and that he would be pleased to place his knowledge and services at their disposal. The date was accordingly altered to July 4.

Hackney Photographic Society.—June 9, Mr. R. Beckett presiding.—A report of the excursion on the preceding Saturday to Leigh was given by Mr. Dean. A discussion was held on the lecture on *Lighting*, given the week before by Mr. W. E. Debenham. Mr. Hoddle, of Messrs. Thorn & Co., showed the

INCANTO ACETYLENE GAS GENERATOR.

It was claimed to be automatic, simple, portable, and safe. A demonstration of its action certainly seemed to agree with these claims, and the light produced was very good indeed, being very much brighter than the incandescent gas, and purer in colour. At the meeting it was subjected to a rather severe test, that of being placed in the club lantern. It illuminated the slides and screen very well, and is superior to any form of oil light or the incandescent gas.

North Middlesex Photographic Society.—June 8, Mr. J. Addison in the chair.—Mr. H. R. F. Wheeler was proposed as a member of the Society. Mr. MUMMERY reported on the last outing to Purfleet. Owing to the absence of Mr. S. H. Fry, who was to have demonstrated on rough bromide paper, and who had written to say he was quite unable to attend, owing to business engagements, the meeting devoted itself to asking questions and discussing various subjects. Mr. CHILD BAYLEY asked if any one had had any experience with isochromatic plates and a screen in a hand camera? Mr. H. STUART said that he had, and it was only a matter of exposure. He found he could give exposures up to half a second, with the camera held in the hand. Mr. SMITH asked for a platinum toning bath for paper prepared by Mr. Moss to formula. Various baths were recommended, among them the platinum bath issued with Solio paper. Mr. MATTOCKS said that, on opening one of Edwards's dark slides suddenly, he noticed a flash of light. This was said to be electricity, caused by the friction of the celluloid shutter against the velvet at the top, and is more likely to occur in dry weather. After a varied discussion on a developer for bromide paper and the permanence of prints toned in the combined bath, the meeting dispersed.

JUNE 15, Mr. H. Smith in the chair.—Mr. MARCHANT said that members would be glad to hear that the President (Mr. Mummery) had been elected to serve on the Hanging Committee of the Royal Photographic Society's Exhibition. Mr. W. J. SIMPSON then proceeded to give a demonstration on

SILVER PRINTING AND TONING,

meant especially for beginners. He said that home-sensitised albumen paper gave finer results than ready-sensitised, as the latter contained a considerable

amount of acid, in order to make it keep. He recommended the paper to be bought ready-salted and albumenised, as it saved a lot of trouble. The strength of the silver bath for floating the paper should be about forty-five grains of nitrate of silver to the ounce, and should be kept up to that strength by adding a solution of 120 grains to the ounce as required, testing by the argentometer. He also gave a volumetric test, using a solution of common salt of definite strength. The paper should be floated for three minutes, and then hung up to drain, and dried between blotting-paper soaked in carbonate of soda, which enabled the paper to be kept about a week. If this was not done, the paper would have to be used at once, as it would not keep. He recommended the acetate bath for toning—30 grains acetate of soda, 1 grain chloride of gold, 10 ounces water—this has to be made up twenty-four hours before using. The borax or phosphate bath could be used instead, and mixed just before using, 100 grains of borax or phosphate of soda being substituted for the acetate of soda. The prints should be fixed in a one to six solution of hypo, and well washed, but not kept soaking. He toned several prints in the acetate bath to a very rich dark brown, and also showed how to float the paper on the silver bath, several members taking away a sheet to print at home.

Liverpool Amateur Photographic Association.—On Saturday, the 6th instant, the members of this Society journeyed to Ellesmere, near Wrexham, travelling by the new railway from Seacombe. The party left the landing-stage at twelve o'clock, and reached Ellesmere about two. The day was a good one for photography, and several good pictures were obtained. An excellent tea was partaken of at the Red Lion Hotel, and Liverpool was reached, after a long journey, about a quarter to eleven. The party included some ladies, and numbered thirteen in all.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

MR. CHILD BAYLEY ON ART.

To the EDITORS.

GENTLEMEN,—Last week but one's edition of your JOURNAL contains some remarks by Mr. H. P. Robinson, the correctness of which I should like to contradict. He writes as follows: "Nothing has ever been more definitely and unanimously acknowledged, by friends and foes all over the world (always excepting Mr. Child Bayley), than the vast improvement in pictorial photography since the institution of the 'Linked Ring.'"

I am not connected "all over the world," but I am fairly well connected over our own little part of it, and I can assure Mr. H. P. Robinson that Mr. Child Bayley is not the "exception" in relation to his opinions as pronounced by Mr. H. P. Robinson. Many friends and acquaintances, as well as myself, are of the opinion that pictorial photography was exactly so far developed twenty or thirty years ago as it is to-day, and the "Linked Ring," is very much mistaken if he attributes in this direction any improvement to himself.—I am, yours, &c., F. B.

ASSISTANTS AND THEIR GRIEVANCES.

To the EDITORS.

GENTLEMEN,—From a most detailed description of "a leading lady photographer" in a letter from a Mr. Randall, in your issue of May 15, there can be no doubt as to the identity of that lady.

Now, from an intimate knowledge of the treatment accorded to the spotters engaged by her (knowledge not given to me by friends of any one), I deny, emphatically, that "a system of slavery" so grossly exaggerated and indignantly assailed by Mr. Randall exists, and more, that even slavery in its mildest form is carried on.

What does Mr. Randall know about wages? When, again, he expresses his opinion of the value of a worker, let him remember that wages are paid for competence, and that beginners are not paid the same as older hands. And for Mr. Randall to say he knows anything about the business, as a fact, that too I deny, though, if I remember rightly, he spent a day at this firm, yet he saw nothing of the spotters.

To accuse this lady of resorting to the degrading practices contained in the second paragraph of the letter under notice, to realise the weekly profits of 100*l.* attributed to her, and so generously published, is utterly false. I am not possessed of such eloquence as Mr. Randall, so must content myself with simply denying his charges, begging Mr. Randall to confine himself to facts, and not to write such things as his letter contains.—I am, yours, &c., NORI.

THE CARDIFF EXHIBITION.

To the EDITORS.

GENTLEMEN,—In reply to the letter in your last issue but one signed "Booth," I am very sorry indeed he should think fit to rush into print for the express purpose of holding up to ridicule a brother photographer of old standing, perhaps the oldest established in Cardiff. It is not everyone who can obtain the highest position, and, as long as a man is a good citizen and works fairly, he is entitled to respect. Cheap work is as great a necessity in every business as the expensive. As regards myself, I am much flattered by Mr. Booth claiming me as a friend, but this I put down as a joke, as he is the *funny man* of the Society; at the same time he has caught hold of the wrong end of the stick when enumerating all my business qualifications.

I was for many years a photographer in Cardiff before becoming a fine art dealer; my love for pictures gradually drifted me into the latter trade. As regards Mr. Booth being a professional, I can quite believe this; how long he has been a professional photographer I am unable to discover, but should say it is about five or six weeks.—I am, yours, &c., ALFRED FREKE.

Cardiff, June 9, 1896.

To the EDITORS.

GENTLEMEN.—I am glad to see that Mr. Faulkes, the Secretary of the Cardiff Photographic Society, has, after three weeks' serious consideration, given the Syndicate's version of amateur *versus* professional.

Before replying to his letter, allow me to give you a short outline of the history of the Cardiff Photographic Society. For years it was called the Cardiff *Amateur* Photographic Society. This title precluded the admittance of professionals. It was desired by several of its then members that professionals should be admitted, and the title was altered by omitting the word *amateur*, and, I believe, the professional brethren of the town were all invited, but only three joined, as far as I know—myself and two others.

This alteration of title did not make the other members professionals, as Mr. Faulkes wished me to believe, when they began to run this studio.

Mr. Faulkes states in his letter that the Photographic Society's name has been used *only* in connexion with the Exhibition of Photographs. I have a letter before me, headed "Cardiff Photographic Society," and signed "T. H. Faulkes, Hon. Secretary," which runs as follows:—

"It has been decided by the Executive Council of the Cardiff Exhibition that all season tickets shall bear a photograph of the holder thereof, and, as we have the concession for supplying these photographs, we shall be glad to learn at what price you are prepared to supply two midgets unmounted, and also what lump sum you are prepared to pay the Society for the sole right of taking these photographs. We need scarcely point out that this right should prove extremely valuable, even if the photographs were supplied at cost price, as it would bring about 5000 of the best people of the neighbourhood to your studio, most of whom would probably order copies of the photographs for their own use.

"We have also the sole right of erecting a photographic studio in the Exhibition grounds, and have power to allot space for this purpose to the extent of 1200 square feet, or 40 × 20, and shall be glad to receive your tender for this also. The photographer would erect the studio himself.

"Awaiting the favour of your kind reply, we remain, faithfully,

"T. H. FAULKES, *Hon. Secretary.*"

I certainly was asked to tender for this monopoly, but the ideas of the *Syndicate* were so large (400*l.*) that I did not tender, thinking then, as I do now, that it was a scheme to put money in the pockets of a few amateurs at the expense of the professional.

Mr. Faulkes states that, to his knowledge, I have bought the monopoly at two other exhibitions. This is not correct; but, even if it were, it would have been quite legitimate for me as a professional.

If the Cardiff Photographic Society is represented by this syndicate, they are like the weather toy I have seen—when the lady comes out it is fine weather, and when the soldier appears it is a sign of wet.

For one part of the year they pose as amateurs, and receive all the attentions usually bestowed upon such societies, and at another start in the profession.

During the four or five months previous to the Exhibition, the Committee never asked the professionals to join in their consultations, although members of the same Society; but, as soon as everything was out and dried, they wanted to know what the professionals would give them. They really induced one photographer in the town to take the midget photographs for nothing, and he took 1400 or 1500, for which the syndicate received 1*s.* each, amounting to 70*l.* or over. Altogether, 5000 tickets have been issued, making a total of 250*l.*, which the profession was entitled to receive.

I should like Mr. Faulkes's definition of amateur as distinguished from professional, as he persists, in another portion of his letter, that I have put about "a report to suit my own ends"—that the studio is run by amateurs. Who is running it if not amateurs? At all events, I am content to take Mr. Faulkes's own statement of facts, and leave the public to judge. These are the facts. A few posing as amateurs open a studio at the Exhibition, and employ professional assistants to do part of the work. There would appear to be no comment necessary.—I am, yours, &c., ALFRED FREKE.

Cardiff, June 15, 1896.

To the EDITORS.

GENTLEMEN,—Mr. T. H. Faulkes, the Hon. Secretary of the Cardiff Photographic Society, in his lucid explanation as to how that Society became transformed into a syndicate, to practise photography as a business, says, "That the Committee did not intend to run the studio themselves your advertising columns will prove, but, not having received an offer for same, they were compelled to engage two professional operators with assistants," &c.

From the above one would imagine that the studio had already been

erected, and that it was necessary to engage the assistance, in order to recoup themselves, and prevent further loss. Such was not the case. It was the right to build that they offered, and that for a substantial consideration too. Professionals evidently could not see much chance of a return on the outlay, and did not tender. "Fools rush in where angels fear to tread," and the Cardiff Society, not to be denied, did the rushing.

Mr. Faulkes did not enter into particulars of another concession the Society had obtained, viz., the right to photograph each season ticket-holder, probably some 5000, for which they were to receive 1s. each.

With a commendable desire to advance the art-science, this unsophisticated Society proposed to professional photographers of the town that they should undertake this portion of the work at cost price of materials, or even without remuneration; this on the ground that it would be a splendid advertisement for the photographer. One gentleman, I believe, did take the work on the latter terms, but, whether he found it not quite so remunerative as he had anticipated, or whether he could not turn out the work fast enough, I trow not; at any rate, other photographers were asked to tender, with the result that some portion of the work was placed in their hands at sweating prices, and finally, when their studio was ready, even this wonderful concession was withdrawn, and the Society went "holus bolus" into the business themselves, with their sole rights to photograph all and everything, living or dead, within the Exhibition and its grounds.

Some one has said that "Barabbas was a publisher;" this must have been prior to the advent of the amateur photographer.—I am, yours, &c.,

15, *Newport-road, Cardiff, June* 15, 1896. T. BRIGGS.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Henry Goldsmith, Hay Cottage, Glen Aldyn, Ramsey, Isle of Man.—*Photograph of landscape. East Glen Aldyn, from the Craig.*

W. H. Jacob, Broadway Studio, Sandgate.—*A copy of an old photograph of the Viaduct at Folkestone, taken about thirty years ago.*

John Davis, 34, Cheltenham-street, Barrow-in-Furness.—*Three photographs of H.M.S. "Powerful," showing H.M.S. "Juno" and Barrow Shipyard; and two photographs of H.M.S. "Powerful."*

T. BRIGGS (Cardiff).—It was an oversight which, however, the nature of the letter renders quite immaterial.

ASPECT OF STUDIO.—LIGHT. A pocket compass will indicate whether the "supposed north light" is direct north or not.

F. H. BURTON.—Thanks for the cutting; it is very amusing. The moral is: Read THE BRITISH JOURNAL OF PHOTOGRAPHY.

SPOTS ON PAPER.—SPOTS. We should recommend you to send some examples of the defects complained of to the makers of the paper. They will, doubtless, be able to help you in the matter.

BLACKING SHEATHS.—A. J. FROAD writes: "Will you tell me the best way to blacken my tin sheaths, through your paper?"—They may be blackened with Bates' dead black varnish, or with shellac varnish, diluted with alcohol, to which some lamp-black is added.

COPYRIGHT.—M. MCNEIL. Certainly an amateur can make a portrait photograph copyright if he took it himself. If the vicar sat for the portrait under the conditions stated, you can certainly prevent any one from pirating the picture, even if it is to be sold in the same bazaar.

BITUMEN FOR PHOTOGRAVURE.—C. LEACH. This must be in fine powder and free from lumps. As you remark, it is very troublesome to grind it fine enough in a mortar and then sift it, but the bitumen may be had ready pulverised and sifted ready for use. Mawson & Swan supply it in that state, so we expect do Penrose & Co.

FADED BLINDS.—S. J. W. We cannot give you directions for dyeing faded green cotton blinds. That is a question for a dyer. However, we may say that you will, in all probability, find it better to replace the blinds by new ones. Faded blinds are generally very rotten, and not worth the cost of dyeing, and, moreover, washed or renovated blinds rarely travel well on their rollers.

JUDGING DISTANCE.—MARINE writes: "In calculating the exposure necessary for a moving object, you take the distance of object from camera in inches, divided by number of yards per hour at which object is travelling, multiplied by focus of lens in inches. How can I find distance of object from camera, as in marine photography it is not possible to measure distance?"—Messrs. Adams & Co. supply an instrument for the purpose; but, for marine photography, we should think any one could estimate near enough for all practical purposes; a few yards is not of very great importance.

THE GRIMSTON SHUTTER.—G. W. Knight says: "I have a Grimston patent shutter, which, I think, is termed the 'right about turn' movement, it being charged by an arm at the top. Will you kindly inform me where I can have same repaired and regulated? I have inquired at a photographic apparatus firm, and was told it was a French make; perhaps you can tell of an English firm who might understand same."—The Grimston shutter is made by Messrs. Wratten & Wainwright, 38, Great Queen-street, who will probably undertake its repair.

METHYLATED ALCOHOL.—S. KOCH. The only way to obtain methylated spirit free from the mineral spirit is to obtain a licence to purchase it in that state. The trouble of obtaining the licence is not great, and the occasional visit of the exciseman will not cause inconvenience. But this fact must be kept in mind, and that is important in your case, the licence will not enable you to purchase the spirit stronger than about sixty-four over proof, and you say you require it as absolute. Neither will the licence to buy the spirit, or one to use a still, permit of the spirit being redistilled to strengthen or purify it.

AMATEURS' RIGHTS.—C. W. writes thus: "Last week I went to photograph some ruins of an old priory. I was told by the caretaker that I could not photograph the ruins, as the owner of the property had given the sole right to do so to a local professional photographer, on condition that he gave a royalty on what was sold to the Cottage Hospital. Is not this interfering with amateurs' rights?"—Certainly not. Amateur photographers have no rights in other people's property. Owners of property—whether ruins or not—can, of course, do as they like with it, and admit who they like to it, and make any terms they choose.

FACTORY ACT.—FACTORY ACT. All the regulations of this Act may be obtained from the Office of the Factories Inspectors, London, S.W. The local inspector of your district will also give you every information. We do not see that "poor photography is being sat upon" because young people employed in photographic workshops cannot be kept after four o'clock on Saturdays any more than are dressmaking and kindred trades. The Factory Act is to prevent sweating. Surely photographic *employés*, like every one who has to earn a livelihood, require a little time for recreation, and that the Factory Act compels employers to give them.

INTENSIFICATION OF VARNISHED NEGATIVE.—J. Yes, the negative can be intensified notwithstanding that it is varnished, but the varnish will have to be removed first, and completely removed too. Immerse the negative in methylated spirit, and let it soak for half an hour or so, rubbing it occasionally with a pledget of cotton-wool. If the varnish dissolves off freely, well and good. If not, a little caustic potash or soda may be added to the spirit; this will aid the solution. When the varnish is dissolved off, rinse with two or three changes of spirit, and then wash out the spirit with water, and proceed to intensify in any way you have been accustomed to.

PHOTOGRAPHING FURNITURE.—R. W. says: "I shall have, in two or three weeks' time, to photograph a quantity of furniture, the negatives to be used for process blocks for a catalogue. The firm tell me I can photograph the articles either before they are polished or afterwards. As I have never done anything of the sort before, I thought I would do it afterwards, as I should get brighter pictures. The manager then remarked that, when they had had similar work done before, the photographer always had the things in the unpolished state. What would you advise?"—Photograph the goods in the unpolished state, by all means. It will save you a lot of trouble in the lighting, and the result will be very much better in the end.

PORTRAIT LENS.—S. E. BENN says: "I have recently been given a lens—a portrait lens—bearing the name of McLean, Melhuish, & Co., and one of the glasses is cracked; otherwise the lens seems good. I have looked in the *Post Office Directory*, and cannot find the name of the firm, neither can I in the advertisements in the ALMANAC or the JOURNAL, so as to get the glass replaced. Can you tell me the address of the firm?"—The firm used to be in the Haymarket, if we remember rightly; but it ceased to exist some decades ago. It was not a maker of lenses, but supplied those of French make, after examination. Any photographic graphic-lens maker would replace the broken glass, though it is a question if it would cost less than a new lens, unless it be of large size.

SALE OF BUSINESS.—R. S. says: "In the autumn of last year I bought this business of —— & Co. They assured me the returns were so much, and the profits a certain amount per cent. upon them. I have been in the business now for nine months, and I find the takings are not half what was stated. Can I compel them to take the business back and refund what I have paid? The people are substantial, and have other places."—Yes, you can, if you can produce evidence of fraud or misrepresentation in the receipts, not without. It must be borne in mind that in selling a business the vendor cannot guarantee that the purchaser will do the same amount of business he did, that must depend upon the customers, and how they appreciate the new comer, and many other circumstances.

PROCESS BLOCKS.—OBSERVER writes: "Is process block-making uncertain work, and do the present cutting prices cause the makers to turn out good, bad, and indifferent work, without rejection of the indifferent and bad? My object in asking this query is, that I see process blocks by the same firms, or, at least, bearing the same names at the corners, that are in some cases most excellent, and in others simply a disgrace to British process work. I can hardly imagine that these firms turn out different classes of work."—We do not surmise that they do; but what our correspondent complains about is, no doubt, due to the print, the paper, or the ink. Unless these are suitable, the best block may be spoilt in printing. Block-makers of repute turn out good blocks, but they are not responsible for their printing, and they are too frequently ruined in that operation.

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EX CATHEDRÂ.

The medals and diplomas awarded to British exhibitors at Chicago have at length been issued to H. B. M. Ambassador at Washington, and have been transmitted by him to the Foreign Office. Sir Henry Trueman Wood has been requested by the Secretary of State to undertake the duty of distributing them, and this will be done at once. All the exhibitors may expect to receive their medals within about a month from the present date.

* * *

We are requested to announce that a summer outing of the Photographic Club has been arranged for Saturday, July 4. Trains from Paddington for Taplow at 10.13 a.m. and 1.5 p.m. Mr. Stretton will have his boat near Maidenhead Bridge at the service of members wishing to visit the district above bridge, Cookham, Boulter's Lock, &c. Meet at 2 o'clock to 2.30 on Monkey Island for luncheon (2*s.*). Easy walk to Windsor during afternoon. Meet at Royal Oak, Windsor, for tea. Trains from Windsor at 7.5 and 8. The entire arrangements have been kindly undertaken by Mr. W. R. Stretton, of 4, Queen-street-place, E.C., and Mr. J. R. Gotz, 215, Shaftesbury-avenue, W.C., and members and their friends wishing to join the excursion, and desirous of obtaining railway tickets at a reduced rate (2*s.* 6*d.* return), should make their wishes known to one of these gentlemen not later than Monday next, June 29.

* * *

Professor Buka, of the Berlin Technical College, has, it is stated in a contemporary, succeeded in observing the internal organs, or some of them, by means of the X rays. He uses a screen consisting of a plain glass plate closely covered with paper, in which a U-shaped window is cut. Barium platino-cyanide is very evenly spread over this U-shaped space, and the whole is covered with a second layer of paper. The remainder of the apparatus is the usual Crookes' tube, a Ruhmkorff induction coil, &c. When the screen is placed before the luminous vacuum tube, the U-shaped space becomes fluorescent, and, if the outspread hand is brought between the screen and the vacuum tube, the bones, which, of course, are not penetrated by the X rays, appear on the screen as dark shadows with outlines. They may thus be directly observed, and the movements of the joints are equally visible on the screen. A still more striking phenomenon was the direct observation of the ribs, the respiratory action of which was quite perceptible; and, in addition to the osseous parts of the thorax, there came into view a dark mass on its left side, showing the distinct outlines of the heart. The liver also became visible, but the lungs, which are penetrated by X rays, were not seen.

* * *

The attention now being bestowed in many quarters on the probable utilisation of acetylene as an illuminant for photographic purposes invests with peculiar interest the report that a very serious accident has happened to Mr. Lennox, chief assistant to Professor Dewar, which was caused on Tuesday last week by the explosion of an apparatus containing acetylene that took place in the laboratory. It is stated that Mr. Lennox has thereby lost the sight of one eye. At present, we also learn, the sight of the other does not appear to have been impaired, and it is hoped this will be completely preserved. Particulars with regard to the cause of the explosion will, we are sure, be awaited with interest by photographers contemplating the employment of acetylene.

* * *

We occasionally receive from photographers in remote parts of the country requests for information as to the address of

any one undertaking the preparation of illuminated addresses for presentation purposes, and such an inquiry to hand this week gives us the opportunity of mentioning that Mr. W. Theodore Parkes, of 14, Nevill's-court, Fetter-lane, a clever artist and engraver, has recently submitted to us for inspection an illuminated address made by himself which was presented by the London staff of the *Irish Times* to the proprietor, Sir John Arnott, on his receiving the honour of a baronetcy. Alike in design, colouring, and execution, the address is a beautiful work of art.

* * *

A VALUED correspondent, Mr. George Bankart, sends us the description of a method he has adopted for the prevention of frilling in celluloid films, elicited by the complaint on the same subject made to us by Colonel Gubbins in the JOURNAL of June 12. Film-users generally, who find themselves working with films that are prone to frill, will probably welcome Mr. Bankart's remedy, which, he informs us, he adopted with collodion dry plates twenty-five years ago.

* * *

(1) PROCURE a small bottle of varnish made of amber dissolved in chloroform. (2) Get a small camel's-hair pencil, and tie it to a thin stick of cedar or wood like the handle of a painter's tool (artist's brush). The stick acts as a "guide" to the brush when applied to the edge of the plate or film. (3) Dip the tool into the chloroform varnish, and run it quickly round the edge of the film on the emulsion side. It will leave a fine film of varnish, which dries very quickly and is impervious to water. Care must be used not to use too much, or it will overlap the rebate edges of the plate (or film), and will prevent the action of the developer; but, if neatly done, it will be a perfect cure for frilling, and is easily and quickly applied. It will dry (enough to handle) in one minute. If it is desired to take it off the negatives *after* they are completed and washed, a little clean chloroform will do it. Guard against splashes or spurts of varnish on the film, as, if any spots settle on it, the development will be prevented. If the emulsion has been slightly separated from the support (in cutting up), the varnish will run in underneath it and cement it to the support.

* * *

WE have received the catalogue of the Photographic Exhibition now being held, under the auspices of the Glasgow Corporation, in the Camphill Gallery, Glasgow. It is prefaced by some brief but clearly written notes on photographic processes, given in historical order from the days of Niépce downwards, from the pen of Mr. James Paton, the Secretary of the Exhibition Committee, upon whom the work of organization has largely fallen. The Exhibition appears, from the list given in the catalogue, to be rich in features of historical interest, while examples of ancient and modern printing processes and apparatus are included, which will, no doubt, prove instructive and attractive to the visitors. The Exhibition will remain open, we believe, for another two months.

* * *

THE next meeting of the National Association of Professional Photographers will be held at Leeds during the Convention week, the annual meeting being fixed for Tuesday evening, July 14, at the Imperial Hotel, Briggate (the Association's headquarters). Mr. W. Barry, of Hull, is the President of the Association, which some time ago formally resolved to take part in the proceedings of the Convention. The Secretary of the N.A.P.P. (Mr. D. J. O'Neill), 47, Charlotte-road, Birmingham, will be glad to receive, as soon as possible, the names of members intending to be present.

* * *

THE Sixty-fourth Annual Exhibition of the Royal Cornwall Polytechnic Society will open at Falmouth on Tuesday, August 25, 1896. As usual, medals and prizes are offered for photographs by professionals and amateurs, and for photographic apparatus. Information respecting the photographic department may be obtained from Mr. W. Brooks, Laurel Villa, Wray Park, Reigate (member of the General Committee).

SLOW AND FAST PLATES FOR HAND-CAMERA WORK.

AT a recent meeting of the London and Provincial Photographic Association there was an interesting discussion as to whether slow plates or fast ones were the preferable for hand-camera work. The subject is a seasonable one to deal with just now, as the conditions under which hand cameras are employed at midsummer are widely different from what they are during the autumn or winter months. It is manifest that plates which can be successfully used now would be quite unsuited to a winter or an autumnal light. Of course, "fast plates" and "slow plates" are but comparative terms, and what some characterise as slow others consider as fast. This was the case at the meeting referred to. The majority of makers now supply plates of three degrees of sensitiveness, and opinions were varied as to which of these it is most desirable to use. The object of the worker, it is needless to say, is to obtain the best possible negative, and the question is, How is that best accomplished?

A slow plate is alleged to give a better, photographically, negative than a very rapid one. But, of course, a slow plate demands a longer exposure, and to give that entails greater risk of the camera not being held perfectly still during that period, as well as the chance of moving objects being palpably blurred in the picture; also a slow plate cannot be used with so small a stop in the lens as a quick one can without increased risk of movement, hence there may be a lack of sharpness in the different planes of the picture. With plates of great rapidity a quick exposure may be given, even with a small diaphragm in the lens; hence the chance of movement, either of the camera or the subject, is reduced to a minimum, while the greatest sharpness in different planes of the picture is ensured. But it is said that very rapid plates are difficult to manipulate, inconvenient to use, and that there is not the same latitude in the exposure that there is with the slow ones; also that the grain in them is so coarse that the negatives are unsuitable for enlarging from or for lantern purposes. The question is, In which direction does the balance of advantages lie?

It is quite true that at one time very rapid plates were characterised by great granularity of the image, so great, indeed, as to show palpably in enlargements, even of moderate size, and very pronounced on the lantern screen; but of late makers have given a deal of attention to this point, and very quick plates, if not the quickest, may now be obtained with a grain as fine as that which was only to be had on "ordinary plates," so that part of the question may be dismissed. With

reference to the subject of manipulation there is no question that plates of ultra rapidity are somewhat more inconvenient to use, and do require greater skill in working than slow ones. For this reason novices are more likely to obtain better negatives photographically on the latter than on the former. Then comes the question of movement during the exposure. With objects in motion, the exposure must be so brief that no visible movement is shown, yet sufficiently long for full detail to be secured in the shadows of the picture—a quality too frequently absent in hand-camera work. Then comes the immobility of the camera during exposure. A second is a very short time, yet there are few hand-camera workers who can hold the instrument absolutely still for that period, or for even a quarter of the time. There is no question that, the briefer the exposure can be made, the less chance there is of blurring from movement either of the camera or the objects photographed.

There is no doubt whatever that many work at quite an unnecessary speed, and employ plates of unnecessary rapidity, thereby increasing their difficulties and the uncertainty of their results. An exposure of the twentieth or the thirtieth of a second is quite sufficient for most hand-camera subjects—street scenes, and the like—with a lens of moderate aperture, and there is no difficulty in holding the camera quite still for that time. Any good lens of not less than five and a half inches focus—such as most hand cameras are furnished with—will cover the quarter-plate well with an aperture of *f*-11, and such a stop will suffice for rendering the different planes in most subjects quite sharp. Under these conditions plates of what are known as of medium rapidity—intermediate between "ordinary" and "extra rapid"—will, in an average light, suffice for all ordinary purposes. Why, then, it may well be asked, use extremely rapid exposures, when they are not required, which entail the employment of ultra-quick plates, with their accompanying inconveniences, and, in unskilled hands, uncertainty in the results? We are not referring to work in the winter months, when, of course, circumstances are different from now.

Plates of extreme sensitiveness are a power at command, and when the light is dull, and with some subjects, results may at times be secured with them which could not otherwise be obtained; therefore it would sometimes be an advantage to carry both kinds of plates, and expose either as occasion may require. This, unfortunately, the majority of magazine cameras will not permit of being done. It is here that dark slides and changing boxes have an advantage. If a magazine camera could be arranged to carry two different kinds of plates, so that either could be exposed at will, it would often prove an acquisition when the acme of perfection in results is aimed at.

Another New Test for Iodides.—This is founded on the fact that thallous iodide is quite insoluble in cold dilute alcohol, even in the presence of salts of ammonia and other compounds in which, when dissolved, thallous chloride is taken up. The iodide is precipitated out of a 30 per cent. alcohol solution by a 4 per cent. solution of thallium sulphate, and the thallous iodide thrown down after standing half a day washed with a mixture of 30 per cent. alcohol, containing 5 per cent. of ammonium sulphate, washed in a filter, dried at boiling point, and weighed. Any chlorine present is estimated by precipitation with nitrate of silver, after first boiling the filtrate to expel the alcohol, and adding about 3 per cent. nitric acid. Bromine is found in a similar manner, but the result is less exact, as thallous bromide is not entirely insoluble.

The Platino-cyanides in Röntgen-ray Work.—The opinion of observers upon the relative values of the various platino-cyanide salts is by no means unanimous. T. Argynopoulos has been experimenting with the various compounds with the object of ascertaining their respective powers, and finds the barium salt to be inferior to those of either the potassium and sodium or potassium and lithium salts. He found the luminosity with the former was visible at a short distance only, while with the latter salts the luminosity was visible at five feet distance.

An X Ray Meter.—This is the name given by Messrs. Reynolds & Bransom, of Leeds, to an ingenious and simple little instrument they have devised for readily ascertaining the strength of the rays from a focus tube. It consists simply of a series of layers, like terraces, of metallic aluminium, in the form of a quadrant. The meter is placed between a fluorescent screen and the focus tube, and can thus be used as a measure of one tube's capacity against another, or for ascertaining the relative strengths of the radiations from various parts of the tube. Of course, if a permanent register be required, a sensitive plate will be used in lieu of the phosphorescent tablet.

Uranium as a Radiation Source.—M. Henri Becquerel has shown that this metal gives off radiations of photographic potency after passing through such opaque bodies as cardboard, aluminium, copper, platinum. The effects are precisely similar to those before described, obtained with salts of the metal, but are about four times as powerful.

At a meeting of the Royal Society of Edinburgh last month Professor Chrystal suggested the use of metallic uranium for intensifying Röntgen rays.

The Action of Light on Ferric Chloride and Oxalic Acid.—M. Georges Lemoine has been investigating the proportions of this action, his arrangement for varying the intensity of the light falling on the small cell in which the liquid is contained consisting in the use of two large polarising prisms. The result of his experiments goes to show that the chemical action is directly proportioned to the visual intensity of the light, there being no appreciable "period of induction." The result was the same whether the total amount of light was permitted to act continuously or at intervals. He found, too, that on calm, cloudless days the visual intensity of the light remained virtually without alteration for comparatively long periods.

Combustion of Acetylene.—The following figures, extracted from the proceedings of the Paris Academy of Science, will be of interest in connexion with the burning of mixtures of air and acetylene, seeing that it has often been stated that the presence of air is advantageous to its due combustion. Air with 7·74 per cent. of the gas burns completely, the product being carbonic acid gas, and the flame pale yellow, with little illuminating power. Between that proportion and 17·37 per cent., hydrogen and carbonic oxide are found in the products of combustion; the flame is pale blue, with a feeble yellowish aureole. With more than the latter proportion the combustion is incomplete, some unburnt gas being found as well as hydrogen and carbonic oxide, and the flame is red and smoky. 2·8 and 65 per cent. are the extreme limits within which combustion takes place.

Experiments with "Dark Light."—M. Gûstav le Bon continues his experiments on this subject, which appear still to attract but little attention in comparison with that given to the Röntgen rays. Seeing that the dark light appeared to possess many characteristics in common with electricity, he supposed it might be possible to condense it, like electricity, on the surface of metallic plates, and his experiments have borne out his suppositions. The following are his conclusions:—*Invisible Radiations of Fluorescent*

Bodies.—These pass through metal; they are reflected and refracted, and consequently show none of the characteristics of Röntgen rays. *Röntgen Rays.*—These do not pass through metal, and are neither reflected nor refracted. They pass through black paper. *Radiations from Metallic Surfaces illuminated by Visible Light.*—These pass through neither black paper nor the majority of organized bodies, but do pass through a great number of metals. They possess also the property of being condensed on the surface of metals. *Radiations proper to Organized Beings.*—Radiations are emitted in darkness by organisms, and can produce photographic effects which M. Le Bon has shown by operating on ferns, fishes, and various animals. They seem to be connected with the radiations of invisible phosphorescence, only they differ from them in being unable to pass through the metallic bodies, especially so with aluminium, with which the author experimented.

Home-made Chloride of Gold.—We have on more than one occasion, when writing on the subject of the saving and conversion of residues, advised our readers, or those of them who are unversed in chemical manipulation, to leave the conversion, at any rate, to those who are competent to undertake the task, for, even when successfully performed, it is questionable whether it results in any economy to do it at home; but, when the work is inefficiently carried out, the actual loss may be, as in a case that has just come under our notice, out of all proportion to any saving that could possibly accrue. There are very many of our readers, too, who not with a view of ecouomy, but rather for the sake of the experiment, will persist in the attempt to convert their own residues, and to those also we give the same advice, "Leave the task in competent hands, it will pay you better." It is a very easy and simple matter to dissolve so much silver or gold in nitric acid or aqua regia, but it is altogether a different affair to produce a satisfactory product.

Such was the experience of a young amateur who has just appealed to us in his distress. Everything had gone wrong in his printing arrangements, and, no matter whose paper he used, not only could he get no decent tones, but all the detail was bleached out of the prints. The toning bath—the formula, at least—was the same he had formerly used with success, except, as it turned out, he was using his own chloride of gold. He did not think there was anything wrong with that; "nothing could be easier than to make chloride of gold, he could not see where any one could go wrong." Yet, unfortunately, he had gone very wrong. Simply he had dissolved his gold, using plenty of acid, which was perhaps what made the operation so easy, and, after evaporating to dryness, redissolved the result to make up a solution containing by calculation one grain of chloride of gold per ounce. As a matter of course, his solution was terribly acid, which he did not at all take into account, and, if he had done, the result would not have been greatly improved, and so all his troubles arose.

It cannot be too strongly borne in mind by those who will dissolve their own gold residues that it is of the utmost importance to get rid as completely as possible of all traces of acid. Formerly this did not matter so greatly, but with modern printing papers the retarding influence of soluble chlorides in the toning action is so great that the old practice of neutralising an acid solution of chloride of gold with chalk is of very little avail. The only possible way of working is to prepare the chloride in a state of neutrality, and it is just there where the difficulty comes in. Any "muff" can dissolve the gold if he has it.

JOTTINGS.

The illustrious Goethe's dying aspiration is said to have been "Light; more light!" In a different sense to that meant to be conveyed by the expiring author of *Wilhelm Meister*, his words have frequently been echoed by photographers pining at times for more daylight, for more "light" in the dark room, and for new and improved artificial illuminants. In the latter regard the newest claimant for notice—acetylene—is likely, as I have already pointed out, to engage and deserve much attention during the coming winter. By that time I hope the calcium carbide that is then available will be pleasanter to use than some I have recently had occasion to experiment with. I may have been unfortunate with these particular samples, but the odour they gave off strongly resembled the overwhelmingly complicated perfumes you sometimes encounter at gas works, or in the vicinity of a sewer—so much so, that my "search after knowledge" of acetylene, which I was recently conducting in my domestic abode, was the other night ruthlessly stopped by the peremptory refusal of its other inhabitants to put up with the "nasty, sickening smell." Do all samples of the carbide behave in this way? and, if so, how can the smell be thrown down?

There appears every probability of the Convention meeting of 1897 being held in East Anglia, Norwich marking itself out as a most suitable centre. Opportunities will surely be given for exploring some of the quiet and charming rivers and broads of the English Holland, as it is sometimes called, while, in addition to the places named, such towns as Bury and Ely are full of interest for the photographer and the archæologist, so that all the elements are to hand for assuring a good meeting. I wonder if it would be possible to secure the co-operation of that enthusiastic lover of East Anglia, Dr. P. H. Emerson, and persuade him to lead an excursion? Better still, why not Dr. Emerson as President?

A very great number of plates are exposed during these Convention meetings and on the whole, taking circumstances and conditions into consideration, the number and the average quality of the results obtained are fair. But far less "serious" photography seems to be attempted than might be the case. Now, as an exhibition of photographs forms an attraction at each Convention, would it not act as an incentive to Convention photography to institute a section for photographs taken at places visited by the members, and offer Convention "plaques" for the best work? I suggest plaques because medals and certificates are done to death elsewhere, and an artistically designed plaque might have an ornamental as well as a commemorative value.

Mr. Child Bayley has heroically resisted the temptation to reply to Mr. H. P. Robinson and the other critics who took him to task over certain portions of his paper on photographic societies and photographic art. I am the more surprised at this "mute but glorious" attitude, as at least two of those who ranged themselves against him afforded him the opportunity for a highly effective rejoinder. However, I merely interpose for the purpose of protesting, in the mildest manner, against the admirable advertisement which Mr. Bayley, a sturdy anti-Salonite, has given the photographic Salon. Mr. Maskell should send a cheque for at least 5*l.* 5*s.*, half for Mr. Bayley, and half for the editor of the Journal for having published the advertisement in its columns. The references to the Salon having nobbled the lay press, sold photographs at good prices, and attracted artists and photographers to its exhibitions, are calculated rather to entrap than repel the average would-be exhibitor, so that I should not be surprised if the Committee of Selection did not this year have a larger and more varied number of pictures to choose from than hitherto. I am disappointed that Mr. Bayley missed one obvious point, which is, that, while the Salon may be allowed to claim having done something for "Art," nobody will dream of accusing it of having done anything for photography. While the Royal Photographic Society continues to advance the interests of photography, in all its varied aspects, as it has done during the past two or three years, it has nothing to fear from the sporadic competition of the Salon.

I hear that Mr. J. Bulbeck, a clever worker personally known to many of my readers, is about to commence practice as a photographer, mapping out for himself a field embracing the best and highest class of technical work. He will have associated with him my young friend, Mr. John H. Avery, than whom as an architectural

photographer I know nobody better. I wish the new firm every success.

I was much interested in the description given at page 347 of Mr. W. I. Chadwick's plan of photographing animals to scale by using a lens of known focus, fixed at a known height, in conjunction with a screened and measured framework, which, by means of a system of double printing or otherwise, would enable the actual and proportionate size of the animal to be read off in the photograph. For breeding and stud purposes the plan should be decidedly useful, and it is probably worth the attention of the Jockey Club and other societies interested in thoroughbreds and live stock. The plan, which is reminiscent of the Bertillon anthropometrical system, might also be found serviceable with human beings, as cases (outside the criminal jurisdiction), doubtless, occasionally arise where it is desirable to have a reliable photographic attestation of a man's height and "points," say, for example, in corresponding with a lady through the post with a view to matrimony; in applying for a situation as footman, or as janitor at a music hall!

From the discussion on the subject of the photographic installation at the Cardiff Exhibition, that has been running in these pages for some weeks past, it seems that the old controversy, amateur *v.* professional, has recently broken out at Cardiff in a very acute form. The Cardiff Society, it appears, is administering the photographic monopoly at the Fine Art and Industrial Exhibition, and seems in a fair way to make a profit out of it. The local professionals rise in arms against this "amateur" usurpation, which provokes the retort that the concession was open to professional tender; and this, in its turn, brings forth the rejoinder that there was no chance of professionals making a profit out of the "rights" offered to them.

The Cardiff Society is evidently composed of smart business men. They have set up as professional photographers. They have a studio in the Exhibition grounds; they have the concession for photographing the season ticket-holders; they try to sub-let these concessions; they fail, and so they work them themselves, pocketing the profits, risking the losses, as other business men (and photographers) do. I entirely sympathise with Messrs. Freke, Horton, and Briggs in their protest against a society, ostensibly formed, I suppose, for the study and advancement of photography, entering into competition with professional photographers and continuing to call itself a "Society." It is in reality a photographic company if ever there was one.

Apparently the professionals had no chance of *directly* tendering for the concessions, in which case it appears to me that they have simply been elbowed out of a field which was rightly and legitimately theirs. There are many amateur societies that confer great advantages on photographic progress by occasionally engaging in exhibition management, but this is the first instance I have met with in which that course has operated to produce the effect of taking the bread out of professional mouths, and I hope it will be the last. COSMOS.

HALF-TONE SCREENS BY PHOTOGRAPHY.

III.

SINCE I wrote on this subject a few weeks back I have had several letters asking for information on points which it appears I have left somewhat obscure, and as there may be others to whom the following remarks may be useful, I propose to add to what I have already said.

First of all, I must thank an old friend for his joking letter charging me with having "gone back to the bath at last," but I would point out that I have not. In recommending bath plates in preference to emulsion, I thought I made it sufficiently clear that that recommendation was made for the benefit of those who are not well-versed in the preparation of collodion emulsion. Where suitable materials are available and an intimate knowledge of collodion emulsion work, just as good results can be obtained with the latter form of films and with less trouble to the regular emulsion worker; but I expect the very reverse will be the case with the habitual wet-collodion man, for whom the advice was chiefly meant. In fact, of two men equally unacquainted with collodion emulsion, the one who happened to be well up in wet-plate work would be at a decided disadvantage as compared with one who knew nothing at all about it, since he would have a good many things to unlearn before he would feel comfortable with emulsion, whereas the simple washing and drying of a wet plate would present absolutely no difficulties.

Then, again, with unsuitable pyroxyline and solvents of doubtful strength, the preparation of an emulsion that will give an absolutely structureless film, such as is required for the present purpose, is a perfect impossibility, and to attempt to carry out the work under such conditions would be simply to court failure. After all, though I commenced by "denying the soft impeachment" of going back on emulsion, I am not very sure that for this particular class of work—the reproduction of screens—if I had a lot of work to do, I should not prefer the bath on the score of evenness of film, though, on the other hand, perhaps the balance of advantages would perhaps turn in favour of emulsion.

The difference between the two processes is just this, that, whereas a perfectly fluid collodion may be very highly salted, an emulsion containing the same quantity of bromine, in the form of bromide of silver, would be too thick to flow with anything like the smoothness necessary. The collodion, moreover, can be filtered under pressure through the very finest of filtering media without injury, but such treatment applied to an emulsion would rob it of the bulk of its sensitive material.

Two or three correspondents join issue with me in the matter of simply bromised or bromo-iodised collodion, on which particular question I am not going to take very strong ground either way. As I said in my previous article, the presence of a little iodide is advantageous, on the ground that it renders the film less liable to halation or internal spreading, which is a matter of no little importance. But I cannot go to the same length as my correspondents in believing that an ordinary bromo-iodised collodion is more sensitive, and in every way superior, to simply bromised when used dry. On the contrary, I emphatically deny this, although I am free to admit that possibly an old "wet" hand may prefer—at first—the bromo-iodised plate. After a little experience, however, with a strongly bromised collodion, I think he will alter his opinion, and find that he will not only get greater sensitiveness, but also far greater density of image and contrast. However, this is a point on which convenience or individual fancy will be studied more than quality of result, as either form of collodion will work satisfactorily.

There is this to be said equally in favour of the bath—inasmuch as it gives less "structure"—and of simply bromised collodion, that it is only where these conditions are observed that the "reversal" process can be successfully adopted. It is quite possible for ordinary negative work to use an emulsion that shows a very decided amount of mottling and irregularity of film before fixing, but which disappears entirely in the hypo. This is owing to the fact that the development proceeds downwards from the surface of the film, and, unless it be carried right through to the glass, the image is tolerably uniform in character, and the unevenness lies in the unreduced bromide, which is removed in fixing; but, when we turn to the 'reversal' process, it matters not whether development is carried right through the film, as it ought to be, or whether it reaches only partly through, the final result is the same; the bulk of the original mottling remains in the bromide unreduced by the developer, and when, after the removal of the negative image, this is in turn reduced, it stands to reason that the unevenness remains in all its original force, if not with added intensity.

So far as the presence of a small proportion of iodide is concerned, I do not think that it interferes in the slightest degree with the reversal of the image, but the conditions are altogether altered when, as in the case of an ordinary wet-plate collodion, the film is chiefly composed of iodide of silver. It is usually supposed that, when but a slight trace of iodide of silver is present with the bromide, the two undergo simultaneous reduction by the alkaline developer, but this can scarcely be the fact when the iodide preponderates. Were it so, the presence of the iodide would be in no way detrimental, since, if it suffered reduction, it would also be amenable to the action of the nitric acid or other solvent subsequently applied. Upon such a bromo-iodised film—that is, one containing a very large proportion of iodide—it is quite possible to develop a strong, vigorous image

with alkaline pyro; but, if this be treated with nitric acid, instead of dissolving completely, as in the case of a plain bromide film, the iodide of silver remains behind as a veil over what should be the transparent portions of the negative or positive as the case may be. Theoretically, the reapplication of alkaline pyro should reduce only the bromide of silver left behind, and leave the iodide to be removed by a second fixing; but, practically, it will be found that the alkaline developer has sufficient action on the iodide of silver to produce a badly veiled reversal; for which reason, if for no other, I think a very small proportion of iodide is admissible.

No doubt, those who uphold the use of the ordinary wet-plate collodion have not had the reversal process in view, as it is not all who would choose to adopt that plan. But others amongst my correspondents complain that they cannot get clear reversals either with nitric acid or ammonia (iron-alum). These are possibly using bromo-iodised collodion, which would, as I have shown, produce the result, or, more likely, have not carried the first development sufficiently far; or, again, have been using too thick a film of bromide, which the developer is incapable of penetrating completely. Where the reversal method is to be adopted, the film of silver bromide should not be too thick for the developer to penetrate in a reasonable time; indeed, I think the best results are attained, and with much greater ease and certainty, with a film decidedly thinner than would be used for an ordinary negative. If this point is attended to, and the development carried some degrees further than it would be if a direct negative were being taken, the image will go right through to the glass, and, on the application of the nitric acid, perfectly clear glass lines will be obtained. The only effect of over-development is to reduce the general density of the final image, but this is not of much moment if the image has been developed through to the glass, as bromide of copper will give any amount of density without the opportunity of filling up the transparent lines.

There is one other point in connexion with the chemical side of the manipulations that I may touch upon, and this holds good, I think, in every branch of process work where alkaline development is used. Many operators err in trying to get full density in development, which, in the majority of cases, only leads to filling up the clear lines or dots. If a proper exposure be given, and a quick development, with a strong, well-restrained solution, a result will ensue that, for ordinary portrait or landscape work, would be described as "hard"—that is to say, the shadows will be clear glass. If the negative be now fixed, and intensified after fixing, there is almost no risk of filling up the shadows; whereas, if the intensification be carried out before fixing, development is going on, more or less, at the same time. The old rule with collodion dry plates used to be—for *contrast*, intensify after fixing; for *detail*, before.

Turning to the other side of the question, several correspondents complain that they cannot get square dots, however close the screen may be to the plate, and even when using a square stop. Well, I do not know that this matters very much; for my own part, I think that circular dots, which when reversed form a cross line screen with circular apertures, should theoretically behave better than square ones, just as a circular lens is used in preference to a square one. If modern screen theories be correct, these apertures act as minute lenses, and, that being the case, the circular aperture is the better. I do not say it is impossible to get square dots, but it is very difficult except when they just close up and form the chessboard patterns; and this holds equally good whether the screen is being copied in contact with the plate or in the ordinary way for enlargement or reduction. The circular shape seems to depend upon the spreading action of development rather than upon any other influence, for, if a very short exposure be given, the dots *are* square, but the deposit is not thick enough to be of any practical use. There can be little doubt that, were it a matter of importance, the exposure and other conditions could be so adjusted as to form square dots, but it seems to me the circular ones do very well and are less trouble. W. B. Bolton.

FOREIGN NEWS AND NOTES.

Glazing Shadows.—Count Vittorio Turati, of Milan, recommends, in the *Photographisches Archiv*, glazing as an important means of improving the shadows and deep tones in process prints, platinotypes, bromide prints, &c. The process is a simple one, and gives excellent results in the hands of the man of taste, but even the ordinary worker, who must study cheapness and rapidity, will find it worth attention. The print is coated with bichromated gum, or other medium, again exposed in the printing frame under the negative, and afterwards washed in tepid water. The shadows retain the gum rendered insoluble by exposure to light, and their depth and transparency are considerably enhanced. Accurate register is not of much importance for the second printing. As a further means of increasing the effect, a slight addition of colouring matter, of either cold or warm tone, according to subject, may be made to the gum solution. Similar processes are used in chromotype, chromo-lithography, &c., where the shadows are treated with varnish. Recent American process prints also exhibit a glazing of this sort, and thereby gain considerably in character and attractiveness. Count Turati thinks both glazed and matt surfaces are open to objection individually, but combined they should carry all before them.

Röntgen Photography.—Eder and Valenta give an account in the *Photographische Correspondenz* of experiments they have made to reduce the exposure. The definition in the photograph increases with distance between tube and subject; but, as the intensity diminishes as the square of the distance, a point is soon reached beyond which it is useless to go for practical purposes. Orthochromatic plates were not found of any use to shorten the exposure. Fluorescent substances were tried in conjunction with ordinary plates. A screen of barium platino-cyanide gave negative results, and a uranium glass plate was also of no use. A plate was dipped in a solution of sulphate of quinine, but did not show increased sensitiveness, perhaps due to the presence of moisture, which lowers the efficiency of the rays. Better results were obtained by warming the plates to 50° C. on a water bath. Winkelmann's and Strombel's experiments with powdered fluorspar were also tried, and gave good results. Films gave still better pictures, and it was found that the exposure might be reduced to one-half, or one-third, by placing the sensitive side of the film in contact with the powdered fluorspar, but a certain granularity was noticeable in the photograph, due to the powder, which could not be entirely obviated by repeated grinding of the fluorspar in an agate mortar.

The Goerz Lens.—The *Photographisches Wochenblatt* gives an account of the Goerz lens factory, which now employs 250 workmen on the premises and forty opticians outside. On December 2, 1894, was celebrated the completion of the 20,000th lens, and the number has since risen to 29,000.

Pyrocatechin.—Liesegang draws attention in the *Photographisches Archiv* to this substance as a developer for chloride prints. Owing to the lower price at which it is now procurable, it may attain some importance as a developer for dry plates. Prepare the following solutions:—

A.

Water	250 grammes.
Acetate of soda	50 „

B.

Alcohol	200 grammes.
Pyrocatechin	10 „

For use, equal quantities of both solutions are taken and diluted with water, according to exposure or strength of contrast required. For soft prints ten parts each of A and B, with fifty parts of water, are recommended, but for great contrast increase A and B to twenty-five parts each. With the same developer less exposure will give weaker prints. Develop rather stronger than required for the final result, and tone in the usual combined bath. This will give prints of the ordinary photographic brown tone. Fixing without toning gives unpleasant tones and reduces the print too much.

Improving Process Negatives.—Dr. Eder, in the *Photographische Correspondenz*, gives the following chemical method for

modification of the size of the dots, which has been used with great success in the Vienna Technical School. For such a purpose the image of the screen may be more pronounced than usual in the negative. Smaller stops may be used, and pre-exposure can be utilised with much effect by means of a sheet of white paper, say for twenty minutes, at *f*-50 to *f*-60 with a square stop. The exposure is then made for the original, with a round stop, at *f*-15 to *f*-16, and should be in proportion to the pre-exposure, which in this case would be six to ten minutes. Develop with a four per cent. iron and sulphate of copper developer. Before fixing, the negative is intensified with hydroquinone and silver. Fix with cyanide of potassium, wash, and whilst still wet intensify by dipping in a solution of—

Sulphate of copper	120 parts,
Bromide of potassium	4 ,,
Water	1000 ,,

followed by quick, plentiful washing in water, and a bath of 1 part of nitrate of silver to 10 or 20 parts of water and a few drops of nitric acid. The negative is now reduced in cyanide of potassium solution, to which has been added a solution of iodine and iodide of potassium. This is carried so far that the dots in the shadows are fine and sharp, but still black on a transparent ground. After another washing, intensification with silver and copper, as before, is repeated, and the negative is again thoroughly washed, and then intensified with lead. This bath consists of—

Ferridcyanide of potash	6 parts,
Nitrate of lead	4 ,,
Water	100 ,,

Filter, dip the negative in the same, whilst still wet, till a yellowish white colour is attained. Wash thoroughly in running water, until the negative is whitish, then flow over it a solution of one part of acetic acid to one part of water, wash thoroughly and blacken with ammonium sulphide. The reintensification with copper may be omitted if the negative is clear and plucky after development. Dr. Eder recommends this method of correcting process negatives as practical and safe.

Orthochromatic Photography.—It is instructive, and sometimes amusing, to see ourselves as others see us. In an article upon dry plates for different photographic purposes, R. Jahr, of Heidelberg, says in the *Photographische Correspondenz:* "In England, where the use of orthochromatic plates has long been neglected, eager attention has been given to them of late, and of course with good results. But this could not happen without contradiction from persons who either cannot, or will not, go forward. We mention, as a curiosity, that, according to the experience of a certain Mr. White, colour-sensitive plates only show orthochromatic properties when they are used with a deep yellow screen and exposed a few thousand times longer than is necessary with an ordinary plate without yellow screen. Photographs of moving objects—not to mention sitters in a studio—are therefore impossible with these plates, and the whole process is only of importance for the reproduction of a few oil paintings. Contradiction is unnecessary for us in Germany. The writer can, however, mention that he has repeatedly taken instantaneous pictures of street scenes, in which tram cars going at full speed are quite sharp, and this on orthochromatic plates, without a yellow screen." The writer's appreciation of the use of orthochromatic plates in this country seems to be confined to the remarks of Mr. G. R. White at the Croydon Camera Club in January of this year (THE BRITISH JOURNAL OF PHOTOGRAPHY, p. 45). Perhaps German makers of orthochromatic plates will be sending over large consignments, now it is announced that instantaneous pictures may be taken on them without a yellow screen!

The "Wiener Photographische Blätter."—We can recommend the June number of this paper to our readers as an excellent one. It is published by the Vienna Camera Club, and contains two excellent photogravures besides a number of smaller illustrations. The frontispiece, a photogravure portrait of Dr. R. Obermeyer, by himself, deserves special attention for pose and artistic treatment. It was taken with a spectacle lens. We gather from this paper that an organized movement is on foot for photographing, with a view to publication, characteristic farm houses and farm buildings in Germany, Austria-Hungary, Switzerland, and frontier countries. Each country will have a separate part, which may be bought separately. As the associations of engineers and architects have taken the matter in hand, the work will, no doubt, be of great value as a record of country habitations.

PHOTOGRAPHIC WORKERS AT WORK.

VII.—How a "Meisenbach" Block is Made.

Just as America was named, not after its discoverer Columbus, but after Amerigo Vespucci, whose connexion with it was much slighter, so has custom conferred upon the half-tone block, made by means of a lined screen, the name of Meisenbach. M. G. Meisenbach, however, although not the inventor of such blocks, was the first to make the process a really commercial one, so that use and wont, in this case, has been nearer the mark than it frequently is. "Meisenbach blocks" are now frequently spoken of when half-tone blocks by other makers than the Meisenbach Co. are referred to, but that Company, whose works cover a considerable area at West Norwood, may fairly claim to be the pioneers in what has now become so large an industry, of which industry they enjoy a very large share.

The Meisenbach Company commenced business in Farringdon-street twelve years ago, but it was not long before they found that the vibration of that busy thoroughfare interfered seriously with the making of the screen negative, and that they would have to select a spot where this evil did not exist; so a site at West Norwood was chosen for the factory, which was then specially built for the work. Nowadays, of course, since the use of the copying cameras hung on a swinging framework has been introduced, vibration is not such a bugbear as it was in the early days of process, such as 1884, and many firms are able to carry on their work successfully in the heart of a big city; still the tendency is for such industries to go further away from the crowded streets and high rents of the metropolis, and, no doubt, the move which was caused by vibration has not been without other advantages besides.

Probably most of the readers of the JOURNAL are acquainted with the various stages by which a half-tone relief block is prepared; still, as a preliminary to our account of the works where so many are made, we will run over the operations in brief. The photograph, drawing, or other subject to be reproduced, is photographed, a wet-plate negative being made in which the tints of the original are broken up into a series of dots by means of a glass screen ruled with black cross lines placed immediately in front of the sensitive plate during exposure in the camera. From this negative a print is made either by the bitumen or by a bichromated gelatine process upon a zinc or copper plate, which plate is then etched by immersion in an etching solution such as perchloride of iron. The etching liquid eating away the unprotected parts, leaves those which have been protected standing up above the rest, as required by the printing press, and it only remains to mount the block "type high" on a wooden slab.

To come to the works themselves, we were first shown a separate building in which were the gas engines and dynamos for the electric light. It contained three engines, two of fourteen and one of twenty-four nominal horse power, of which two were in use on the occasion of our visit, and the other in reserve. Each gas engine is connected by a belt with a Siemens dynamo. From these dynamos is taken the current, which lights not only the arc lamps in the studios, but two large arcs for printing purposes, as well as a number of incandescent lights employed throughout the buildings for ordinary lighting purposes. After a glance round the neat and orderly engine-room, we returned to the main building, only noting on the way that there are three large stoves for the hot-water pipes, which are laid throughout the whole of the building for heating purposes.

The first of the operations alluded to above, that is to say, the preparation of the half-tone negative, is carried on in three studios, which contain in all thirteen cameras, each provided with its easel and a pair of arc lamps for illuminating the copy. While on the subject of the studios we may mention an incident told us by Mr. Dilworth, the manager, indicating how experience in a new industry has to be bought. "Here," says he, "is our first studio, which we built with a north light, thinking it would be best for copying purposes. We found it too weak, so that, when building the second studio, we gave it a south aspect, only to find that the strong sunlight cast the shadows of the window frames on the easels. Finally, in putting up the third studio, we disregarded daylight illumination altogether, and relied on arc lamps entirely." We found accordingly in all three studios the daylight practically ex-

cluded, although through the open door of one we caught a pleasant fresh glimpse of green leaves and grass.

The studios are lofty buildings with white walls, and are of a long rectangular shape. Down one side are the cameras, down the other a row of dark rooms for the operators, together with a little room for glass-cleaning. Each studio has an attendant whose duty it is to keep it clean and in order, and to provide the operators with all the clean glass they need. Patent plate is employed for the negatives, the image being cleaned off when once the block is made, and the glass used afresh.

From the studios we were taken into one of four rooms where the printing on metal is carried out. The negatives when made are delivered into the hands of the printers, together with a piece of metal the proper size. Both the albumen, the bitumen, and the enamelline processes are carried on here, the last-named being usually adopted for copper only. Mr. Dilworth told us that the larger proportion of the work done for newspaper and other publications printed on inferior paper was engraved on zinc, which was found best suited for that purpose; and copper for finer work, where high-grade paper and ink are used. For this purpose, enamelline is not much used, as the heating which the plate has to undergo in the process is likely to be detrimental to a metal with so low a melting point. For copper, the fish-glue or enamelline process is not attended with the disadvantage alluded to, and is employed with success.

Printing on to the metal plate is performed either by daylight or by means of an arc lamp of a very powerful nature (of which there are two in operation here), under which prints are obtained in from three to fifteen minutes according to the negative employed. There are four sets of printers in this department, whose employment we have described, and who hand the printed plates out to the etchers, who then take them in hand. Previous to this, however, each plate has its final dimensions indicated upon it by means of four lines, which are cut round the picture on the zinc or copper. The rough etching, or etching proper, as it may be termed, is carried out in a series of stoneware sinks which extend all down one long room. From these baths the etched plates are taken to a press and proved, the print so obtained being compared with the original. Plate and proof are then passed on, when necessary, to the fine etcher's room, where, by rolling up and rebiting, vigour is given and contrasts brought out, equal to the original copy. Here also it goes into the hands of the engravers, who give what final artistic touches may be necessary, after which the plate is cut to size and a final proof taken before it is mounted and made ready for delivery.

Having in this way passed through the works and followed the process stage by stage from the making of the negative to the mounting of the block, we found ourselves once more in Mr. Dilworth's office, and are shown a print from what is probably one of the longest half-tone blocks in existence, its dimension being a little over thirty-nine inches wide; the subject is a bird's-eye view of Oxford, and the appearance of the block all that can be desired. Before leaving we put our courteous guide through a little cross-examination for the benefit of our readers, and elicited from him the fact that there were now about 100 men in employment at the works, ten or eleven cameras being now in constant use. At the rate of ten negatives per day to each camera—no very extravagant estimate, and, when it is borne in mind that four, six, or even more, subjects are often copied on one plate—it will be seen that the works are capable, without any further increase of any kind, of an output of about 300 blocks per day, or 1800 to 2000 per week; or, for those who do not care for mental arithmetic, about 90,000 per annum, allowing for a fortnight's holiday in the year all round. When it is remembered that this is one firm only, the size of the half-tone industry is seen to be extraordinary for one of such rapid growth, and we find ourselves wondering of these blocks as some philosopher has of the pins—where they all go to?

The screens in regular use at West Norwood are of 75, 85, 110, 125, 133, 150, and 175 lines to the inch respectively, although others are used occasionally. Of these the 75 lines is that employed for newspaper and similar work, and is known as "open grain," 125 lines being styled "fine grain" and being that in the largest use. Some of the screens in use have been made on the premises, being photographic copies of the ruled screens, and these are found to be in every way satisfactory; in fact, it is no uncommon thing, where a number of blocks have to be made to some special out-of-the-way size of grain, to make a screen for them in this way.

Before leaving we asked Mr. Dilworth how long it takes to make a block throughout. "In the ordinary course," he replied "we have the finished block ready in two or three days. We often, however, have to get blocks turned out the same day as they come in, and, if required, a block could be pushed through in two or three hours, but high speed is not advisable where the best result is desired."

A FEW PERTINENT QUESTIONS.

[The Professional Photographer.]

A few well-known Michigan photographers who were exchanging experiences lately were asked to state six questions that they would like to have answered in the columns of the *Professional Photographer*. The questions below were given by them in response as being of especial interest at the present time, and, as it was intended at that time to devote this number to Michigan photographers as a Michigan number, a few good men of that State were asked to answer these questions. Some have responded, and their answers follow the list of questions.

The Questions.

1. What do you consider the most effective colour for mounts used for matt-surface papers—(*a*) for dark tones, (*b*) for sepia tones? Do you favour large or small mounts?—by small mounts are meant the usual cabinet size for cabinet prints, &c.

2. What do you consider the best background for show-case displays? What class of work does it pay you best to exhibit?

3. Does advertising pay, and what do you think the best method of advertising for the photographer?

4. What accessories do you use when photographing babies? How do you keep them "in pose," and what means, if any, do you employ to attract or give expression?

5. Do you favour Sunday work? Does it pay? Would you support a Sunday-closing Act if made general?

6. Of what actual value to you are the photographic journals?

(1) Answers to the Questions, by Chas. E. Heath, Grand Rapids, Michigan.

After a careful consideration, and experimenting with different colours for mounting the matt-surface picture, I have come to the conclusion that, while there are a variety of colours which are effective and harmonious, including some of the shades of grey, tea colour, terra cotta, &c., there is nothing so truly artistic, refined, and pleasing in the long run as white. In recommending a white mount I would add that there should be a border around the print about a quarter-inch wide of India tint or some other insubordinate shade, which, though hardly visible against the white, adds greatly to the effect of the picture when mounted.

A few months ago I prepared some prints of different sizes, from 20 × 24 down to cabinet, for exhibition purposes, and mounted them as follows: The prints were toned to the black-and-white tone, mounted on ordinary black and white cardboard mounts, and bevelled, leaving no margin of mount whatever.

They were next mounted with glue on deep, cream-coloured, pebbled matt board. I next cut a matt out of pure white matt board, making the opening one inch larger each way than the bevelled print. This matt was mounted on the cream board so as to leave an equal border of cream colour half-inch wide around the print. The whole was then placed in a plain gilt frame, half-inch wide and without glass. The effect is not only exceedingly pretty, but is neat, and does not detract from the picture itself, which is always to be avoided.

Another mount which is very artistic and effective for the black tone is one of black. The print should be bevelled as before, and mounted upon the black cardboard, or, if for framing, the matt should be black, with a deep white bevel and a gold frame.

As I confine myself to the black tone, I have not been as observant of the effects for sepia, still I should again recommend the white mount.

A nice effect is obtained with sepia tone and sepia mount to match, but there must be harmonious blending of the two or the effect is entirely lost.

In using the sepia mount as above mentioned, there should be a narrow border of white between the print and the mount to give the best effect.

The matt prints should have wide margins about them; the margin of the ordinary cabinet mount for a cabinet print is not sufficient to show it to the best advantage.

In preparing pictures for the show-case, I think it would be difficult to decide upon any one background as the best, because where the pictures are changed the background should also be changed in order to make a complete revolution, which is the only way to attract the most attention. All of the backgrounds must be good and selected with great care, but each one should be different from the preceding.

In my present display the backgrounnd is gold, produced by coating large sheets of matt board in the same manner as for gold matts. The prints are matt surface, toned black, which is the only kind I exhibit or make. They are mounted on cardboard and bevelled, then mounted on black cardboard so as to leave a border of black about three-quarters of an inch wide around the print. The whole is then mounted on the gold in the desired position. In addition to this the show-case is illuminated at night by twenty miniature incandescent lamps, and the whole effect is the most attractive of anything I have yet observed.

The show-case at the door is one of the photographer's best advertisements, and, as the advertising question is one which to a great extent absorbs the minds of merchants in all lines of business, I will give my opinion, gained from actual study and experience. I find that advertising pays, but there are modifications to that statement. The newspaper, programme, in fact, any of the established methods of advertising are

good; still, setting these one side, the pictures themselves are the best advertisements for the photographer. In no other line of business does the result of one's labour show to advantage or disadvantage, as the case may be, as in photography. If one makes twelve good cabinets for a customer, the supposition is that those twelve pictures go into twelve families, which means that you have proven directly to twelve families the quality of your work. *Good work* is by all means the *best* advertisement. The babies are the most satisfactory customers one has. There is very little to be done excepting to place the baby in some suitable chair, which can be covered by its clothes, focus, and then use your patience. Accessories do not improve babies' pictures. Get a good photograph of the baby, and you will surely please the parents and all its friends, which you will find is also an excellent advertisement.

One cannot do much to induce babies to assume a suitable expression; don't be in too much of a hurry, because, if the baby is left partly to itself, the expression will come, and be better than if the little one is worried. Oftentimes various sounds to which it is not accustomed will be a help, although I do not find it necessary to keep the operating room full of rattles, tin horns, &c.

I am asked for my opinion concerning Sunday work. I most *emphatically disapprove*, still I am obliged to keep open my studio every Sunday.

If one judged the value of Sunday work by the number of sittings, the conclusion would be that it paid. On the other hand, the people who say they can have their picture taken only on Sunday would not go without them, and if they could not get them Sunday would get them some other day. I will venture to say that seventy-five per cent. of such people find time during the week to attend a ball game or some other place of amusement.

There is no reason why a photographer should be obliged to work seven days each week.

The studio is confining, and to do one's best work an occasional rest is necessary. I believe every intelligent and progressive photographer should and would support a Sunday-closing law, and it is only through the efforts of the photographers themselves that this can be accomplished.

In this work the journals can be of great service, and it is on questions of this kind, as well as by articles on actual manipulation of different processes, that the journals are of actual value to the profession.

Every photographer should read the journals, for it is by this means only that he can have knowledge of what others are doing who are doing the best.

The photographer who never reads a magazine of the subject, who never goes to a Convention, is sure to discover at some time, sooner or later, that he is decidedly behind the times, and his business gone.

(2) By Herbert Randall, Ann Arbor, Michigan.

I will repeat your questions in their order, and answer in accordance with my judgment.

1. What do you consider the most effective colour for mounts used for matt-surface paper (*a*)? For dark tones (*b*)? For sepia tones?

For black tones, grey or white.

For sepia tones, a soft brown.

2. Do you favour small mounts or large ones for the usual cabinet size print?

For best effect I favour larger mounts than are ordinarily used for cabinet prints, but I do not believe in using them without an advance in price. I get two dollars a dozen extra for cabinets mounted on large mantello mounts.

3. What do you consider the best background for show-case displays?

I use garnet, black, or dark green velvet, or plush.

4. What class of work displayed attracts the most attention and the most dollars?

Portraits of familiar faces.

5. Does advertising pay, and what method is best?

A certain amount of judicious advertising pays, but I think much money is wasted in advertising. With me the best advertisement is a well-dressed window, kept fresh and clean.

6. What accessories do you use in photographing babies? How do you keep them in pose? What means do you employ to gain expression?

I use very few accessories. If you refer to six-month-old babies, it is "catch as catch can;" if two or three years of age, it's a difficult thing to explain. I talk into their eyes; they understand common-sense conversation better than older ones, often are so mobile and quick to grasp your thought that the cleverness of magnetism is usually sufficient; but, if it is a certain expression that the mother is after, you are about as sure of it as you are of catching the "lightning bug" that flits before you on a summer evening. I wish mothers could understand that, the more starched up the child is, the less poetry and childishness is impossible to obtain in a picture; their preparatory training is an obstacle; their "Do just as the man says" makes more trouble than it overcomes. The charm of child beauty is simplicity, every-day home apparel, bare feet, if it may be, without fuss and feathers.

7. Do you favour keeping galleries open on Sundays? Does it pay? Would you support a Sunday-closing Act, if made general?

I do not approve of opening places of business on Sunday. It makes no difference whether, from a financial standpoint, it pays or not; however, I believe it does not in the long run. I object as a matter of principle, but I have a class of trade which would denounce it. Then I believe no man is fit for work seven days in a week, and he ought to get both rest and inspiration, at church or elsewhere. There is no argument in its favour, spiritually or otherwise, based on good judgment. I am not a crank, and would accommodate a customer under special circumstances. I simply condemn the practice of general opening of a place of business on Sunday. I would not in any way interfere with my neighbour's affairs, yet I believe his disregard for the Sabbath retards the progress of civilisation. I try to live up to my own ideas of what is right; on this law all happiness is based. I honour manhood, and would not ask an *employé* to endanger his character by performing duties which I would not do myself. This is a consideration that every *employé* is entitled to. I believe that existence and happiness do not so much depend upon dollars and cents as some think they do.

8. Of what actual value to you are the photographic journals?

Both I and my workmen get inspiration from them.

I do not think that art theories are discussed enough therein.

The literature of æsthetics, criticisms, and contributions of a different order might be of value. The soul is developed by beautiful thought, and it is partly within the province of our art to furnish it.

The commingling and interweaving of refined ideas are means for elevating, and by these and the infinity of nature we are trained to higher things, being, as Hamerton says, "only something by the place we hold in the intellectual chain of humanity."

(3) By G. H. Fowler, Charlotte, Michigan.

1. Technically speaking, I would not like any coloured mounts for matt surface photographs; would prefer a light shade of drab or grey. I think a line of India tint to come between the margin and photograph would look well, especially with black tones. I like plenty of margin.

2. It depends on the shade or colour of mounts and tone of pictures. Black will do for almost any tone. Maroon and shades of drab and grey are good. Quite an effective and lasting background is made by stretching some burlap or any coarse cloth over a board and mixing up alabastine thick, then work in relief plastic designs, and while wet pouncing on gold bronze on prominent parts. Almost any shade goes nicely with gold.

3. It pays to exhibit the best work you can make, and not exhibit it very long at a time. A small show-case at the door, changed often, is a good thing. If you do large work and your studio is upstairs, and no one else uses the stairway, a good way is to fix up a sliding show-case to run down nights. Make it to fill up the entrance; use pulleys and rope weighted so as to make it run up and down easy, then put in a light—incandescent is the best—and exhibit your large work framed up and put in your case evenings. I have one, and exhibit a good many pictures during the year in this way. Your pictures are an excellent advertising medium. Spicy locals in newspapers pay; attractive bulletin boards in the country pay. Best of all, don't allow any poor work to leave your studio. Let Cheap Johns turn out that kind of work.

4. Any kind that will not attract the eye from the subject in hand, the baby. In portrait photography the background should not be remembered by those who look at the pictures. I like to get happy pictures of babies, and I always catch their smiles if I can, unless the mother objects to smiles, and very few do. Yes, I try for expression, have tried for an hour at a stretch before now, and sometimes have caught it, but it is better to have everything in shape and catch the expression quick. I have a raised platform to sit babies on who can sit up, then turn their feet around to one side or the other, never in front. They look as though they were sitting on the floor, and are quite satisfactory.

5. I do not favour Sunday work, and never do any except in extreme necessity. I would favour and support a Sunday-closing movement.

6. Journals are of great value, like conventions; exchange of ideas; more experience from workers who have had a "finger in the pie." I take five; yours makes six.

WOOD-ENGRAVINGS *VERSUS* HALF-TONE BLOCKS.

[An Extract from a Paper read at the Society of Arts.]

Wood-engraving, we are told by some people, is dying out, or will be one of the past arts before many years, and process or mechanical work by means of photography will take its place as a medium for illustrating books, magazines, and papers.

This is what we hear on all sides, and, if we look at the illustrations at present produced in most of the publications, it undoubtedly does appear at the first glance as if there were something in this almost universal opinion. But what is this so-called popular opinion? I think it only comes from readers who confine themselves to the sensational side of literature, and, not having their imaginations fully developed, want something beyond the letterpress to help them to realise what they are reading; *then* cheap art comes in to help the cheap publications, which are on the increase to such an extent, that process illustration looks as if it were taking everything before it.

But, by dipping a little deeper into the question, we find a very different state of things. We see that wood-engraving was never more alive as a fine art, or in a higher state of perfection, than it is at the present period; and it is still capable, in the hands of right good, earnest workers, of being lifted to a much higher position.

We may grant that wood-engraving has been superseded for a time, for

purposes of illustration, by process work, on account of the latter being so much more rapid, and also much—very much—cheaper. I will not say very much inferior, for it is unquestionably better than bad wood-engraving. And here I may say, I do not mean essentially bad work, but work that has to be done in a rush, such as war subjects, which sometimes have to be engraved in a few hours.

Yet, so long as the public are blind enough (blindness which makes one wonder, considering the art culture that is going on all over the country) to take bad, or rather, as some put it, "soft and delicate" kinds of illustration, instead of good art, both delicate and beautiful, so long will some publishers give them bad rather than good work, charge the same for the publication, and pocket the difference; and why not, if the public will be so foolish? Every opportunity is afforded them to distinguish the good from the bad; but they, or the majority of them, judging from the publications that pay best, prefer the bad to the good. Then, what happens? So long as this blindness or apathy lasts, so long will wood-engraving suffer in this particular department of publication.

But we have a much brighter side to look at. Let us leave behind the lovers of cheapness and speak to those who are lovers of art for art's sake. To them I say that wood-engraving, as a reproductive fine art, never can be touched, or ever will be touched, by any process yet invented. I am now speaking of all the mechanical processes at present being used for illustration. With regard to the higher or fine-art processes, I hope to show further on that wood-engraving is far and away above any of them in its marvellous versatility of technique, which enables the engraver to translate not only the values, but the very individual touch of each artist, from whose picture he may be engraving.

All processes dependent upon photography are bound to go wrong in the rendering of values, since photography has not yet been brought to such a state of perfection as to master the difficulties of exact colour translation. In fact, photography is utterly inadequate in the most simple wash drawings in black-and-white. For instance, a drawing executed in black, no matter what black, when Chinese white is used mixed with the black, will come out, as a whole, entirely untrue as to values in the process block, because of the brown in the black and the blue in the white. The slightest difference in the admixture of the two colours will be entirely mistranslated, although the drawing may look perfectly right as to the values to the eye.

Even in a pure wash drawing, without the use of Chinese white, the paper drawn upon being more or less yellow, the high lights that are left are lower in tone in consequence.

Take any process, and, if you have an intimate knowledge of the original painting or drawing from which the process plate has been done, you will see at once how very far short it falls of the original. All the spirit has departed from it—it is weak and insipid. Indeed, although photography has made great strides in late years, it has not yet been able to get over its main difficulty, values, and I must say that I do not see at present how it can get over it. No process plate that I have ever seen, either from a painting or a black-and-white wash drawing, has had a pure black, or a properly gradated white, which is as much as to say, it cannot carry out the most simple rules of translation of values. But I admit with pleasure that a pen-and-ink drawing in pure black ink could hardly be reproduced in a better manner than by the best process. I say the best, as I only now and again see a very fine line reproduced thoroughly well by process. As a rule it is either broken or thicker than the original, and thus loses its value. But, beyond this, I most emphatically assert that nothing does or ever can compare with the work done through the sensitive medium of the eye and hand of man. In fact, I consider wood-engraving far better than any or all the reproductive arts, as it stands quite alone in its wonderful adaptability; for any variety of texture one likes can be produced on the boxwood block. This cannot be said for either etching, mezzotint, steel or copper, each having its own methods, great as the masters have been who have worked upon one or the other of these materials; and, as far as I have seen, they never have departed from the original mode of treatment, peculiar to the material they worked upon. Thus, they have necessarily missed the individuality of the painter they translated, the reason, of course, being that the material will not lend itself to variety of treatment.

Now, with regard to wood-engraving on boxwood, any texture you like can be engraved upon this material, it is so adaptable; but it requires an artistic engraver, not a mechanic, to arrive at anything like good results. Happily, at the present time, we have plenty of right good artistic engravers, not only here in London, but all over the world.

The crowning advantage enjoyed by wood-engraving, through which it obtains its immense superiority over all other methods, is that the engraver is enabled to work in both black-and-white line. This, in the hands of an artistic engraver, one who knows his work, and, beyond that, loves it, is a most valuable power.

Nothing is out of the range of imitation possible to wood-engraving. The differences of texture of flesh, silk, satin, cloth, wool, steel, glass, the grain of wood, marble, weather-worn stone, furs and skins of animals, atmospheric effects, foliage of all kinds; all these it can represent, and, beyond everything, it can render the differences between oil and water colour, and can accurately transcribe the old master's work with all its cracks and blemishes from damp and shrinkage. It has been said by some that the old masters cannot be rendered in this way except by photography.

W. Biscombe Gardner.

JOLY'S METHOD OF MOUNTING AND STORING TRANSPARENT PHOTOGRAPHS.

Dr. Joly states that the object of his invention is to mount transparent photographic pictures on glass, or celluloid, or other transparent material, whether positives or negatives, in a book or album, and so that they can be readily inspected by transmitted light. The leaves of the album are perforated through and through with openings of the required size to receive the plates. Alternate leaves are blank and of white card or other white or reflecting material, so that light reflected from this surface enables the photographic transparency to be seen by transmitted light as the leaves are turned over; or the alternate blank leaves are omitted and a single white leaf or reflector provided, which can be inserted anywhere in the album to reflect light through the pictures on the adjoining page of the album.

MORA'S PROCESS FOR THE REPRODUCTION OF OIL, WATER, AND WATER-BODY COLOUR PAINTINGS.

Sig. G. Mora's invention relates to the reproduction by mechanical means of oil or water-body colour paintings which may, at pleasure, deal with historical or religious subjects, represent landscapes or other views, or be used for advertising purposes, for the preparation of topographical plans or geographical maps, for imitating carpets or tapestry, or for the reproduction of serial views (or copies thereof), also of book covers, frontis-pieces, or the like; all of which reproductions or representations it is proposed to obtain by the superposition of transparent colours upon the layers of colours used in the original to be reproduced, no matter whether these are oil colours, water colours, body colours, or honey colours, or whether they are coated with varnish, size, or gelatine, the various reproductions, upon cloth, paper, wood, metal, ivory, or the like, being so carried out, that they present accurate copies of the originals—no matter whether of old or recent creation—rendering every detail of the model copied from, every stroke of the pencil or brush, and giving even a notion of the relative thickness of the several layers of colour applied, so that the appearance of the picture having actually been (hand) painted is fully kept up.

This result is obtained by the following method:—

After a suitable support, such as paper, canvas, wood, metal, or the like has been selected, that which may be called a "preparatory" coating is applied thereto; for which purpose a layer of an insoluble mixture, damp-proof and impervious to water, composed of salts of chromium, for instance, bichromate of ammonia, bichromate of potassium, chromic acid, mixed with a watered solution of fish jelly, gum, glue, or the like, making such solution an insoluble one in water, when smeared on a surface exposed to the light, is spread over the support by means of a brush, preferably made of the tail of the hake or salt cod, or simply by hand, or by a suitable mechanical contrivance, according to requirements, or to the nature of the support or of the original to be reproduced. When this is done, the back of the support to be printed upon is covered or lined with paper, or with thin metal plates, as the case may be, such lining or covering being fixed thereto by starch paste, so that a species of stiffening surface is formed for the time being, though it is subsequently (upon the completion of the work) removed by the aid of steam. Now a tracing is taken of the model to be reproduced—which may be the original picture, or a copy or photograph of the same—the operation being the same as that usual in chromo-lithography. This tracing (or positive photographic impression) is then transferred to cardboard, rendered insoluble or water-resisting, or to thin metal sheets, or, indeed, to sheets or veneers of wood, also rendered impervious to water; and these sheets (whatever the material they consist of may be) are converted either by hand, by a chemical process, or by means of a cutter, used while the sheets are dry, into as many open or perforated patterns as may be required to reproduce the several layers or thicknesses of colour, with their different tones or shades, each of such patterns corresponding to a portion of the original, painted a given colour. The support employed (viz., the paper, canvas, wood, or the like), whereon the tracing (or photographic impression taken on the preparatory coating) is applied, is then mounted in a suitable frame.

Upon this support there is then adjusted by means of marking points or pins, one after another in succession, as many patterns as there are different colours in the original requiring to be reproduced, there being one pattern for each of the main colours or shades; after which the corresponding colour is applied to the copy (through the pattern or stencil) by means of suitable brushes, by hand, or by means of special machines fitted with brushes. The colour or ink employed for this purpose should be mixed with a sufficient quantity of a suitable siccative, while in all other respects it should correspond to that of the original, no matter whether such original was painted in oils or water colours or the like, and whether or not it was sized or varnished; and, as in the case of the original, the colours to be used for the copies may be prepared with honey, gelatine size, oil, or the like.

When the principal shades of colouring have thus been reproduced and a complete solid layer of colour formed, and after every stroke of the brush, appearing in the original, has been rendered, with its relative size or thickness (which is seen to before the colour has become quite dry), the well-dried copies are coated with varnish containing alcohol; and then the reproduction of the half-tints is proceeded with.

In order to obtain the half-tints, it is necessary, first, to prepare a photo-isochromatic copy of the picture to be reproduced, which should be transferable by the ordinary means or methods now in use, such as photo-lithography, photo-typing, photo-engraving, or the like, and such copy is then transferred to stone, metal, or gelatine.

These half-tints are then so displayed that, both in design and in value or strength of tone, they are exactly in keeping with the corresponding half-tints of the original; which result is accomplished by chemical processes such as helio-typing, chromo-typing, and the like, and by touching up the picture with a pen, pencil, or graver.

To print the half-tints, impressions, previously obtained upon zinc, copper, stone or gelatine, with ink such as has been above suggested, are resorted to, care being taken to render the said ink transparent; or such ink as is ordinarily employed for lithography or printing generally may be used, plane or roller printing presses (preferably with india-rubber rollers, such as are in use for printing upon sheet metal) being adopted; or printing presses or machines, as used in ordinary typography or lithography, may answer the purpose; or machines, suited to the special requirements of each case, may be specially constructed, the choice of the machinery to be employed depending to a great extent upon the nature of the "support" adopted for the reproduction of the copies.

When the semi-tints have thus been applied to the coloured groundwork, obtained by the aid of the patterns or stencils (which groundwork, may, however, have been produced through the medium of photography, or simply drawn or painted by hand, if preferred), the copies are allowed to dry in a convenient desiccating chamber. After this, the said copies are varnished, so as to raise the tones of colouring into due prominence, whereupon the tracing of the original is again printed, care being taken to sprinkle over it colour which is soluble either in water, alcohol, or petroleum. This tracing serves as a reliable guide for the ultimate touching up, which should be performed by hand, *i.e.*, with a brush, and the object of which is to "finish" the copy, so as to carry the identity between it and the original to perfection.

The last tracing is then removed at the points where this has not been done in the retouching operation; for which purpose a sponge, soaked in water, alcohol, or petroleum, should be used; and the final coat of varnish is eventually applied as is usually done in the case of oil paintings; while, where water-body colour paintings are to be copied, albumen may be employed for the purpose of varnishing.

In some cases, the preparatory operations may be performed simply with a brush, by hand or machinery, and with patterns or stencils, upon a tracing to be finished with a brush by hand; this would specially apply where a large number of copies is not required. The final result obtained by this method will prove positively astonishing in its realism, as it will in a most remarkable manner keep up in the observer's mind the illusion of its being an original hand-painted image or design.

THE W. H. HARRISON FUND APPEAL.

	£	s.	d.
Acknowledged last week	82	4	6
L. F. E.		10	6
Alfred Gordon Salamon Esq., M.R.I.	5	5	0
J. J. Vesey, Esq., M.R.I.	1	1	0
Sir Alfred Wills, M.R.I.	1	1	0
J. W. Swan, Esq., F.R.S.	2	2	0
L. Loeffler, Esq., M.R.I.	1	1	0
	£93	5	0

Further donations will be thankfully acknowledged by

FREDK. H. VARLEY, 82, *Newington Green-road, London, N.*

The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

CEMENT FOR GLASS AND PAPER.—CIMEX says: "Can any fellow professional give me a reliable recipe for a cement or paste with which to attach labels to glass? I am in the habit of attaching a label to each of my negatives begore storing them away, and I usually keep them for some weeks on a shelf in the printing room, in case they may be wanted before final storage. The room is always kept warm by means of a stove, and it is annoying to find a large percentage of the labels detach themselves apparently through excessive dryness. I have tried a lot of preparations containing glycerine, sugar, and similar substances, but have not yet hit perfection. I shall be greatly obliged if any of your readers can help me."

CLEANING OLD NEGATIVE GLASS (To W. Howard) — The best way that I have found to clean old negative glass is: The old negatives should be put together in water; water which has a little ordinary washing soap dissolved in it is preferred. Procure a piece of Brookes's soap, and, with a piece of wet rag rubbed on it, apply it to the film, or the bar of soap itself may be used instead. In a short time the film will blister, and can easily be stripped off the glass without the least trouble.—T. MATHIAS.

GREEN FOG (To "Eder Emulsion").—Although the presence or absence of green fog will be influenced to some extent by the character of the gelatine, it is quite possible either to have it or to steer clear of it with one and the same sample. Much more depends upon the temperature employed, for it must be borne in mind that ammonia or any other alkali, in the presence of gelatine at a temperature very little above 100° Fahr., acts as a reducing agent towards silver salts. On this account most gelatines will give more or less green fog with the ammonio-nitrate method of emulsification. As regards the commercial use of this method, it is probable that the immunity from green fog in most of our best brands of plates is due to the employment of the centrifugal separator, which, in removing the decomposed gelatine, also removes the "dye" which is supposed to cause the dichroic fog, as well as the coarser particles of silver which go to form ordinary grey fog.—SYNTAX.

WET PLATES AND ALKALINE DEVELOPMENT. — A BEGINNER IN WET-PLATE WORK writes: "I have read somewhere, recently, of a method of intensifying wet-plate negatives, after ordinary silver development, by means of alkaline pyro, and I have also been told that it is possible to develop wet plates in the same manner; but, having tried both plans, I have signally failed to arrive at any result but a hopeless mass of fog. Naturally, I can understand the importance of removing the free nitrate of silver from the collodion film before applying the alkali, but I do not think it can be the neglect of this that has caused my failure, as I have been careful to wash very thoroughly before proceeding either to develop or intensify, but still the fog comes. Can it be that for such treatment the bath requires to be in a special condition as regards acidity, or perhaps of alkalinity? My trials have been made with ordinary bromo-iodised collodion (Mawson's) suitable for iron development."—In reply, there is no reason why a wet plate, that would develop properly with iron, should not also behave in the same manner with alkaline pyro or any similar development, provided the film be first rigidly cleaned of all free silver; but this is an operation that requires more than a mere perfunctory surface washing. After a copious rinsing in plain water, the plate should, for safety's sake, be flooded with a weak solution of common salt, and again rinsed, when it is scarcely likely that any free nitrate will remain. This can be done either before or after exposure, or, in the case of intensification, after the first development.

RECOVERING SILVER FROM HYPO SOLUTIONS. — THEO asks with reference to our recent leading article on *Experiments upon Hypo Residues*: "What is the best metal to use for the purpose of precipitation?" He goes on to explain, "I do not like liver of sulphur—because for want of space I am obliged to keep my residue tank in any ordinary workroom where I have to do my toning and fixing, and, in fact, perform all my photographic work. The stuff itself is sufficiently unpleasant, but I imagine the fumes given off must be actually dangerous to any sensitive films, whether plates, paper, or carbon tissue, that may be exposed to it, and I should therefore prefer to use one of the metals as the precipitant. But which?"—In reply: Zinc, copper, or iron, may be used indiscriminately, and, assuming that the precipitate is to be subsequently sent to the refiner, it matters little which is chosen, as all of them cling with more or less tenacity to the precipitated silver, and each requires special treatment for its thorough removal. If, on the other hand, the silver is to be converted into nitrate by the photographer himself, we should say, use zinc, because although at least as difficult of removal as the others, the presence of a slight trace in the resulting nitrate would be perhaps less objectionable than either copper or iron. Our correspondent must, however, bear in mind that, even when any of the metals are used for this purpose, considerable quantities of sulphuretted hydrogen are given off, and he will be wise to transfer his residue jar to the open air, where, in all probability, the objection to liver of sulphur will disappear.

Our Editorial Table.

Catalogue Received.

Newman & Guardia, 92, Shaftesbury-avenue, W.

This is the height of the hand-camera season, and therefore an appropriate time for the appearance of Messrs. Newman & Guardia's catalogue—as handsome a production of its kind as we have seen. The various patterns of the "N. & G." hand cameras are fully described, and other sections of the catalogue treat of the accessories of those cameras—changing boxes, shutters, stands, and other items of apparatus that Messrs. Newman & Guardia specialise. Excellence of get up and printing distinguish the catalogue, which is adorned with a number of photographic reproductions from negatives made in the "N. & G." cameras. The quality of these pictures is superb, and altogether the catalogue exemplifies in the highest degree the capabilities of the typographic art.

The Half-tone Process.

By Julius Verfasser. Bradford: Percy Lund & Co.

A second edition of this excellent little treatise has been issued. In the sections devoted to negative-making, printing, and etching, much new matter has been added, the author having taken account of the progress that has been made during the past year towards the use of collodion emulsion and gelatine plates. Other and minor additions have also been made to the book, which has deservedly won a permanent place as a clear and reliable exposition of half-tone theory and practice.

Lund's Directory of Photographers, Manufacturers, Dealers, &c.

Bradford: Percy Lund & Co.

The ground covered by this *Directory* includes England and Wales, Scotland, Ireland, the Isle of Man, Europe, Asia, Africa, North and South America, and Australia. The information is given under the heads of the various towns, and also alphabetically, and it comprises the names and addresses of those who are dealers, enlargers, picture-frame makers, lantern specialists, manufacturers, and professionals and dealers. The *Directory* has evidently taken a good deal of trouble to compile, and should prove useful to many.

New Ground in Norway. With Fifty-six Illustrations from Original Photographs by Paul Lange.

By E. J. Goodman. London: George Newnes (Limited).

Southern Norway is the "new ground" over which Mr. Goodman takes the reader. He describes it as that part of the country which lies between Christiansand and Christiania, and extends from the coast inland for from 50 to 150 miles. Southern Norway, unlike the more familiar west and north, is said by Mr. Goodman to be a land of lakes and rivers, forests and mountains. It is essentially a green land, richly fertile in timber and foliage, possessing, so to speak, a clothed wildness, in striking contrast to the more naked savagery of the North. From Christiansand the author pleasantly leads us through a charming and unconventional country. The inhabitants are as interesting, primitive, and agreeable as their surroundings are beautiful, and Mr. Goodman's account of both is attractively written. *En parenthèse*, he has some piquant things to say of Dr. Henrik Ibsen, of whom a portrait is given. There are about sixty illustrations from Mr. Paul Lange's negatives. The reproductions (in half-tone) are well done, and it goes without saying that such a skilful worker as Mr. Lange has not fallen below his reputation. Each view is a picture, and the costume studies are quaint and fresh. It is altogether a delightful book.

The Elements of a Pictorial Photograph.

By H. P. Robinson. Bradford: Percy Lund & Co.

Mr. Robinson's book is thus dedicated: "To my brothers of the Linked Ring, whose efforts have done much towards saving the art of photography from extinction;" and its object, in the author's words, is to help the amateur to recognise that there is much more in the art than the taking of a simple photograph, that its materials are only second in plasticity to those of the painter and draughtsman, and that, if they are more difficult to manage, there are effects to which they are even more adapted than other means of art. The chapters on "Models," "Foregrounds," "The Sky," and "The Sea," illustrated as they are by examples of Mr. Robinson's own work, are probably those that may be read with the greatest direct profit by the photographer, as they are full of sound teaching clearly exposed. Some of the sea pictures, by the way, are very badly reproduced, but the other illustrations are well done, and the book is entirely one whose ripened ideas on pictorial photography give one plenty to reflect upon.

News and Notes.

Messrs. Marion's Annual Stocktaking Clearance Sale will commence on July 1, and terminate July 10.

We are sorry to learn of the death recently of Mr. Henry Jackson, who was in business many years at Fishguard as a photographer.

Colonel George Hope Lloyd-Verney, late of the 3rd Battalion of the Hampshire Regiment, died at Clarens, on the Lake of Geneva, on Sunday week, at the age of fifty-four. He was formerly a member of the Photographic Club.

The Stereoscopic Society, under its recently revised rules, is now prepared to admit four fairly advanced workers, ladies or gentlemen. Full particulars may be obtained from the Secretary, B. Diseri, Huntly, N.B. Early application is desirable.

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, July 1. Subject for discussion, *The Relative Merits of Different Intensifiers*. The date of the Club outing has been altered from June 27 to Saturday, July 4. Full particulars are announced elsewhere. Letters of inquiry may be addressed to Mr. Gotz, 215, Shaftesbury-avenue, W.C. Visitors are welcome.

Photographing Thought.—In his communication to the Académie de Médecine, Dr. Baraduc relates that Dr. Istrate, when he was going to Campana, declared he would appear on a photographic plate of his friend, M. Hasden, at Bucharest. On August 4, 1894, M. Hasden, at Bucharest, went to bed with a photographic plate at his feet, and another at his head. Dr. Istrate went to sleep at Campana, at a distance of about 300 kilometres from Bucharest, but before closing his eyes he willed with all his might that his image should appear on the photographic plate of his friend. According to Dr. Baraduc, that marvel was accomplished. Journalists who have examined the photograph in question state that it consists of a kind of luminous spot on the photographic plate, in the midst of which can be traced the profile of a man!

Society of Arts. Prize for Industrial Hygiene.—The Council of the Society of Arts are prepared to award, under the terms of the Benjamin Shaw Trust, a gold medal, or a prize of 20*l*. The medal, under the conditions laid down by the testator, is to be given "for any discovery, invention, or newly devised method for obviating or materially diminishing any risk to life, limb, or health, incidental to any industrial occupation, and not previously capable of being so obviated or diminished by any known and practically available means." Intending competitors should send in descriptions of their inventions not later than December 31, 1896, to the Secretary of the Society of Arts, Adelphi, London, W.C. The Judges will be appointed by the Council. The Council reserve the right of withholding the prize or of awarding a smaller prize or smaller prizes, if in the opinion of the Judges nothing deserving the full award is sent in.

On reading about the new X rays, our Egyptian correspondent, whose silence hitherto we all deplore, writes to say that, having armed himself with a brand new Cook's tourist camera, an Italian induction coil, and a Crookes' tube, he approached the Sphinx with a view to penetrate the brain of that most ancient of oracles, and find out the why and wherefore of these dispatches of Indian troops to Suakim. He was received with characteristic inscrutable calm and dignity. On developing his plates, he was surprised to find not only an accurate delineation of the features of the oracle, but, strange to say, through some reflected light in the half-closed eye of the monolith, an equally admirable picture of himself as he focussed the scene before him. Unfortunately, the rays brought to bear on the Sphinx were powerless to throw any light on the *raison-d'être* of the Suakim expedition, although the expression on its features so admirably brought out by our esteemed correspondent was, to say the least of it, suggestive. He adds that he means to have another attempt, and hopes to be more successful.—*Journal of the Photographic Society of India.*

"Satisfaction Guaranteed."—"Satisfaction guaranteed" means that one will make sitting after sitting until all the whims of some unreasonable sitter have been exhausted, and even then satisfaction not be found. The photographer should do his best at all times. This is all that should be required. The samples should be an index to the quality of the work done. "One must compete with his own samples," says Mr. J. R. Swain, in the *St. Louis and Canadian Photographer*. "The customer should expect the work to equal the samples displayed, nothing more. If resittings have to be made on account of the hair or clothing, they should be charged for, especially if the fault was in the customer. I have known parties perfectly pleased with their pictures till some old crone called their attention to some little defect in the hair or clothing that did not amount to anything or injure the pictures in the least. But, if satisfaction is guaranteed, the work is all to be done over again. It is sometimes a good plan to give these self-styled art critics a broad hint by asking them to make the resitting for you. One such hint is generally enough. It is one thing to satisfy a customer; it is quite another thing to satisfy the whole family and all their connexions. It is well to have an understanding with the sitter at the beginning, that her picture shall compare favourably

with the samples displayed; nothing more should be promised. If your samples are not satisfactory, better let her go somewhere else. Keep up the dignity of the profession by not promising too much, and making good all that is promised."

COPYRIGHT IN PHOTOGRAPHS.—In the Queen's Bench Division, on Monday, Mr. Justice Cave and Mr. Justice Wills, sitting as a Divisional Court, had before them the case of Guggenheim and Another *versus* Leng & Company. This was an appeal by the plaintiffs, who carry on business as photographers in the Midlands, against a decision of the County Court Judge of Sheffield. Plaintiffs sued in respect of an infringement of a copyright of a photograph by the defendant newspaper proprietors of Sheffield. The photograph was that of the Wolverhampton Wanderers' football team, and permission was given to the defendants to use this in a a paper issued by them called *Sports*. The photograph was issued as a supplement, and not in the body of the newspaper. A number of the photographs, however, were sent to Wolverhampton, and sold separately from the paper. The County Court Judge held in favour of the defendants in this instance, but in another case, in which the heads of the players were reproduced and published in defendants' journal, *The Week*, the County Court Judge found for plaintiffs, and awarded 1*l.* damages, to avoid the expense of a new trial. The Judge was asked to assess the damages in the case of *Sports* if he was held to be wrong, and 20*l.* was fixed by him. Plaintiffs now asked for judgment to be entered in their favour for 21*l.* Their Lordships now held that, though defendants were right in publishing the photograph as a supplement to *Sports*, they had no right to issue it separately, and in this respect the County Court Judge was wrong. Their Lordships reversed the decision in favour of plaintiffs for 1*l.* in respect of the drawing of the head of the players in *The Week*. Judgment was then entered for plaintiffs for 20*l.*, with costs.

"I BELIEVE I am correct in stating," says Mr. Martin R. Cobbett in a contemporary, "that an eminent Cameranian made a long and perilous journey into the wilds of Wiltshire with intent to acquire a counterfeit presentment of Mr. Fulton's mare Laodamia, charming daughter of an, if possible, more perfect mother. His reception was very old Irish in more senses than one, but it began and ended with ancient Irishism; photographing was out of the question. So the ambassador accredited to the court of Fulton came empty away—in at least one respect. Which reminds me that I once was similarly baffled when endeavouring to take or procure the taking of another eminent Irish racer—no less a one than Lord Marcus Beresford. I laid on an artist who could sketch closely enough to the real thing or person if he had a fair chance. All he wanted was to get his subject to be still for a few moments. Lord Marcus, then Jockey Club starter, was approached by stealth on the Rowley Mile. His Lordship tumbled to the artist's game, and figuratively tumbled him over completely, for, like the 'plaguy old woman' of nursery rhyme fame, he would never keep quiet till he chose. My emissary thought to fix him up between the races; this was on a lovely warm day in spring. But he reckoned without his study, who bustled about from one starting post to another, and all the while he had a field in hand. Then, directly they were off, Lord M. played at taking a snooze on the turf, with his arms for pillows. All we got was a most truthful pencil picture of his Lordship's heels and the back part of his trousers, dorsal developments and shoulders, with, as headpiece, a billycock that covered even the back of his head from observation. We had views of the starter from the north and south, the east and west—admirable studies in full length, broadside on, and fore and aft, with true foreshortening effects; but our journalistic enterprise did not go to the extent of publishing these as likenesses of Lord Marcus. So we confessed ourselves beaten, and did no publishing at all, so far as he was concerned."

AN Exhibition has been given in New York of the results of the new discovery that, by coating the inside of a Crookes' tube with a fluorescent substance, it can be made to give a light comparable to that of an incandescent lamp when an electric current is passed through it. The tube in which the light is produced is an ordinary Crookes' tube, about four inches long and an inch and a half in diameter. The peculiarity of the invention is the coating of the interior of the tube with crystals of a newly discovered mineral that possesses fluorescent properties in a higher degree than the tungstate of calcium. Mr. Edison refused to tell what the mineral is, except that it is abundant and very cheap. The crystals are introduced into the tube and fused to the inside of the bulb. When the current is turned on from the Rhumkorff coil, instantly the tube glows with a pure white light. Mr. Edison says that the X rays are entirely absorbed by the fluorescent crystals, and that the closest tests fail to show their existence outside of the tube. So far, Mr. Edison has only made these lamps of about three and one-half or four candle power. He has now to find a way of producing the light from a direct current without the Rhumkorff coil, and to work out the commercial side of the problem. Some remarkable results have been found. One is that the electrical energy is transformed into light with hardly any heat, and the other is the remarkable conservation of the energy and the great economy of the new light. When Mr. Edison first reached his results, and took the tests by the ammeter and the voltmeter, he could not believe the figures, and sent for other instruments. These gave the same results, and, still to make sure, a third set of testing instruments was brought into use. These only confirmed the original records. The record showed that the new light was produced with the expenditure of only thirty-nine foot pounds of energy per candle power, a marvellous showing when it is remembered that the ordinary incandescent lamp requires about 150 foot pounds of energy per candle power. In other words, one horse power would run 846 of these lamps. The light is pure white, resembling clear sunlight, and has none of the moonlight effect. Tests with the spectroscope show that there is the normal amount of red in the new light. Mr. Edison is confident that he can succeed in reaching the commercial result by eliminating the Rhumkorff coil. He says that he has a new device that he has been working at that will change the ordinary current into one of the enormously high voltage needed with the low amperage. The coil that Mr. Edison is using in these experiments gives a current of from 40,000 to 50,000 volts, while the amperage is hardly measurable. He has tested the new lamps in multiple arc circuits, and finds that they work well together. He is now engaged in test experiments on the endurance of the bulbs, and, in connexion with this, is tackling the commercial end of the problem. He told a *Tribune* reporter that he believed that he would reach the desired end, but that it would be only after a long and costly analytical process. He said: "Of this you are as competent as I am, for it is something that no one can foresee."—*New York Tribune*.

A PRACTICAL ENLARGING PROCESS FOR THE AMATEUR AND PROFESSIONAL.—For many years, at convenient moments, I have experimented to ascertain the very best method to be used for enlarging negatives. There are many times when, in the case of friends passing away, we find only some small pictures, the result of random snap-shot, out-of-door photographs, which, of themselves, are not satisfactory. When the negatives of such pictures exist, a result can be obtained by the process I will describe, which is surprising even to an expert. The method hitherto in use, when the negative proved available, was to print a glass positive by superposition or in contact with the negative, and from the resulting positive—which, of course, is the size of the original negative—make an enlarged negative through a camera. This has always been against my conviction, as it seemed as if the grain, the retouching, and all the imperfections and strie of the glass were proportionately enlarged and reproduced without remedy. But, as it was the generally accepted method in use abroad, and especially in the large (carbon) establishments in London, it was accepted. Of late, I reversed the operation by first making a full-timed positive the exact size desired for the enlarged negative. The amendments, improvements, and changes that can, at this stage, be made are remarkable. Upon the perfection of this positive and the work thereon depends the success in the final result. Let this positive be very carefully retouched and improved, as already suggested. When done, place it in a printing frame, of course with the glass side out, and in perfect contact with a dry plate Back plate with black cloth or felt to prevent halation, and expose it at the distance of, say, 4 feet from a 6-foot burner two or three seconds, depending upon the vigour and strength of the positive. I usually expose and develop a small (4 × 5) plate as a test of the proper time. If all is carefully done, the resulting negative will compare favourably with a negative made from life. When a small negative, especially a portrait, is made with the intention of making an enlarged negative, the sitter should be well away from the camera, the latter having as large a lens as is practicable. For instance, if one possesses a 3A Dallmeyer, the ordinary cabinet negative will be nearer to correct perspective (there is perspective in portraiture) and proportion than if taken with a 3B or smaller lens. An 18 × 22 negative, recently made in the above manner from a cabinet of Mrs. Maud Ballington Booth, compares very favourably in all respects with any negative in my establishment taken direct from life. That the perspective and proportion are better and the distortion less goes without saying; but "that is another story," to which I hope soon to give attention. Finally, let all the steps in the process be carefully made, even to the dusting off and cleaning the uncoated sides of the original negative. Let the positive be somewhat vigorous, but full of detail and modelling. When dry, there is a fine opportunity for the tasteful, careful retoucher to not only remove imperfections, but to much enhance many details all through the picture. Lights may be accentuated and shadows darkened. —GEORGE G. ROCKWOOD, in *Anthony's Bulletin*.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
29	North Middlesex	Informal Meeting.
30	Birmingham Photo. Society	Excursion: Stokesay Castle, Shropshire. Leader, C. S. Baynton.—Last Day for sending in Competition Pictures for May Excursions. Warwick and Sutton.
30	Hackney	*Focussing.* W. E. Debenham.
July.		
1	Borough Polytechnic	Open Night.
1	Croydon Camera Club	Excursion: Hatfield House. Leader, The President.
1	Photographic Club	The Relative Merits of Different Intensifiers.
4	Ashton-under-Lyne	Excursion: Lichfield Cathedral. Leader, J. W. Kenworthy, J.P.
4	Borough Polytechnic	Excursion: Epsom Downs.
4	Hackney	Excursion: River Stort. Leader, H. W. Dunkley.
4	Liverpool Amateur	Excursion: Knowsley. Leader, W. Tomkinson.
4	Oldham	Excursion: Miller's Dale. Leader, B. J. Holt.

ROYAL PHOTOGRAPHIC SOCIETY.

JUNE 23,—Technical Meeting,—The Earl of Crawford, K.T. (Vice-President) in the chair.

COLOUR SENSITIVENESS OF ORDINARY PLATES.

The HON. SECRETARY (Mr. Chapman Jones) read a *Note on the Sensitiveness of Ordinary Plates to the Less Refrangible Light*, and showed the results of experiments made with the colour screens recently exhibited to the Society by Mr. F. E. Ives, confirming Mr. Ives's conclusions, and proving also one or two additional points. On each plate he had photographed the flame spectrum of the double carbonate of potassium and sodium without the interposition of any screen, and the results showed that the visually feeble violet lines of potassium came out very strongly, and were much over-exposed, while the

visually strong sodium lines sometimes showed quite distinctly, but, on other plates, they were very weak, though always present. Other slides illustrated the results obtained by the use of an ordinary Argand gas lamp, and with colour screens made with chrysoidine, aurantia, multiple yellow, and brilliant yellow.

Colour-screen Making and Testing.

Mr. F. E. Ives gave a practical demonstration of colour-screen making and testing. Given suitable facilities and conditions for the work, he thought the best method was to coat patent plate glass with gelatine, and, when the film was dry, immersing in an aqueous solution of the dyestuff until a quantity sufficient for the purpose was absorbed, and afterwards cementing the plate to another piece of patent plate by means of Canada balsam. Unless, however, the necessary facilities and conditions were available, there was great difficulty in preventing dust, &c., settling on the gelatine before it was set, and the moisture present in the atmosphere also militated against the production of satisfactory screens. The method which he had made use of for many years, and which he now demonstrated, was with collodion films. For this purpose it was necessary to employ patent plate glass, with plain surfaces, as nearly as possible parallel to each other, selecting the glass by taking the reflection of a distant gas flame, when only one image of the flame would be visible if the surfaces were perfectly parallel, while, if the glass was prismatic, two flames would be seen, increasing in separation with the degree of want of parallelism in the two surfaces of the glass. Unless one wished to make a number of screens, it was sufficient to coat the plate first with plain collodion, and then with an alcoholic solution of the dyestuff, drain it on absorbent paper, and allow the film to dry spontaneously. If, however, the colouring matter had been tested, and several screens were to be made, the better plan was to mix the dyestuff with the collodion, and coat by one operation. The films were sometimes liable to blister, but this could be obviated by first coating the glass with albumen. The plain collodion should be made with a cotton giving a tolerably structureless film, and, when set, a nearly saturated solution of the dyestuff should be flowed over the film two or three times, and then drained off by means of blotting-paper, the operation being carried on in a dry room to avoid the absorption of moisture, which caused minute pimples in the collodion. When he had tested the dye, and knew that he had what was wanted for the purpose in view, his practice was to make a coloured collodion, for eight ounces of which he took four ounces of an alcoholic saturated solution of the dye and forty grains of pyroxyline, to which was added, after shaking, an equal quantity of ether. To make screens of a lighter colour, plain collodion could be added to the coloured collodion until the desired effect was produced. Some difficulty had been experienced in obtaining the brilliant yellow which he used for screens, but Mr. Cadett had found that it was supplied by Messrs. A. Leonhardt & Co., of Mühlheim, near Frankfort-on-Maine. When dry, the plates were coated with a varnish of mastic dissolved in benzole, cemented together face to face with Canada balsam, and bound round the edges with gummed paper. Mr. Ives made several screens by the methods referred to, fully describing the various operations involved, the dye used being brilliant yellow, and he tested one of them against a screen made with multiple yellow and having visually almost exactly the same appearance. The first object of a colour screen, he said, was to cut out the invisible ultra-violet and the dark violet rays, and at the same time to greatly reduce the action in the blue, and the most effective test was to expose an ordinary plate through the screen and a piece of pot yellow glass and a piece of cobalt blue glass, and, if in the result the cobalt blue was as dark or darker than the yellow, one might be sure that the dark violet was cut out by the screen, which was the essential point to be determined. The two screens were then tested in this manner by exposure to an electric arc light, and the result showed that the brilliant yellow one fulfilled the requisite conditions, the multiple yellow screen allowing the cobalt blue to photograph lighter than the yellow.

A discussion of a conversational character took place while Mr. Child Bayley developed the test plates, and, a hearty vote of thanks having been accorded to Mr. Ives, the meeting concluded, bringing the present session of the Society to a termination.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

June 18,—Mr. T. E. Freshwater in the chair.

A discussion took place as to the appointment of two delegates to the Leeds Convention, and it was pointed out that for some years no delegates had been officially recognised. Eventually it was moved that no delegates be elected to represent the Association this year; but, on being put to the meeting, this was defeated. The meeting therefore proceeded to vote for two representatives, with the result that Messrs. A. L. Henderson and W. D. Welford were elected.

Professor Stebbing, of Paris, who asked about the progress of photography in France, thought they had to look to England more than France for this. He passed round a number of colour screens, and an instrument designed by M. Léon Vidal for testing the colour sensitiveness of plates, and which he was now making. On account of the bad quality and scarcity of the water supplied in Paris, he had cast about for some means whereby perfect washing of prints could be ensured with a limited quantity. He constructed a reservoir, in which were placed, at about three-quarters of the height up, a number of light wooden frames, one over the other, and which were strung across and across with twine, so as to form a kind of sieve. The prints were placed on these sieves face upwards, and the tank filled with water in a slow stream, the surplus being continually syphoned off. He found the prints perfectly washed if left all night, and yet only about four pails of water had been used.

The Hon. Secretary exhibited an album of photographs taken for the arbitrators in the Behring Sea seal controversy, showing the habits and life of these animals in their native state.

Nominations of officers for the ensuing session were made, and a number of suggested alterations of the rules read by Mr. Rapson.

PHOTOGRAPHIC CLUB.

June 17,—Mr. Charles Wallis in the chair.

The Chairman welcomed Professor Stebbing, a member of the Club residing in Paris.

The Hon. Secretary passed round copies of the *Kodak News* and the programme of the Leeds Convention.

Mr. Tottem, referring to some printing-out paper with peculiar markings upon it, which he had shown at a previous meeting, said he had found that these marks were due to the paste used on the label.

Several members expressed their doubts as to whether this was a final settlement of the question.

Professor Stebbing showed Léon Vidal's apparatus for ascertaining the rapidity and colour-sensitiveness of plates. The instrument is a modification of Warnerke's sensitometer. It consists of a series of coloured screens through which the light from a candle is filtered upon the plate to be tested, the resulting impression indicating to which colours the plate is most sensitive. Professor Stebbing said that the instrument is largely used in France, and added, in reply to a question, that the tendency there is for workers to colour-sensitise their own plates. The Professor also showed a series of tinted discs (*Ecrans colores*) of suitable colours for attaching to diaphragms of lenses for isochromatic work.

Mr. Bedding asked if the colours were tested spectroscopically, and an affirmative reply was given.

Mr. Welford then opened a discussion upon the subject of

Art and Science as Educational Factors in the Advancement and Progress of Photography.

He said that this was really a question of art *versus* technique. The particular meaning of the word educational must also be allowed for. He should espouse the art side. Artistic requirements, he said, had improved our processes, our apparatus, and our work, and instanced improved printing methods. Photographa must be judged pictorially—in fact, the public insist upon having art in their pictures, and it is the man whose pictures contain the most art who gets most recognition at Exhibitions.

Mr. Mackie pointed out that Mr. Child Bayley's paper, to which this effort of Mr. Welford's seemed to be a reply, was not a protest against art in photography, but against articles on art in photography.

Mr. Bridge differed from the author of the paper so far as the statement that art had produced improvements in photographic methods. He instanced the commercial gelatine printing-out paper, which was a device for obtaining a passable print from a poor negative. He had no sympathy with the statement that all the art was put into a picture when the exposure was made, or before. He did not find that men who got their living by photography developed their plates a dozen in a dish. The average results would not justify such a course.

Mr. Fry said that art was an appeal to the emotions. He did not think the methods of the worker should be inquired into, or, indeed, had any connexion with the pleasurable sensation caused by looking at a good picture. Every picture must stand upon its own merits, and would appeal to different persons in a different manner. He would give a man who developed a dozen pictures at one time in a dish any credit he thought he was entitled to if one of them turned out a good one. There was such a thing as constructive art in photography, and it sometimes took place long after the exposure had been made. He instanced some of Mr. Robinson's composition pictures, in which several negatives were made to form one complete picture. The picture itself was the thing to be considered, and not the method by which the end was obtained.

Mr. Gotz said that the art side of the question could not by any means be said to stop at the construction of the picture. The painter had first of all to conceive his picture, and then to carry it out. He could no more see that in photography art ceased when the exposure was made than it did in the instance he had given, and which he considered a parallel case. He regarded photography as art based upon science.

Mr. Stretton thought that, as practised by the majority, photography had neither art nor science in it. It had this use, however, that the Philistine could now make a picture record of the places and things he saw instead of maintaining his former barbarous habit of chipping off pieces as relics.

Mr. Bedding said that a portrait photographer, who had to make a pleasing picture for the public, would fare but badly unless he could infuse some artistic feeling into his efforts. On the other hand, the advances in material and in optics, and, in fact, in all branches of photography, had been the result of scientific investigation and improved technical knowledge. The artist and the man of science depend upon one another in photography, and neither would succeed without the other at the back of him.

Mr. Welford, in his reply, said that he could only take Mr. Child Bayley's paper as it stood. He thought it ridiculed the artistic aspiration from beginning to end, and ridicule must always tend to depreciate. He admitted that his paper was a reply to Mr. Bayley's. After dealing with the various speakers briefly, Mr. Welford concluded by maintaining his original position.

MANCHESTER PHOTOGRAPHIC SOCIETY.

This Society made, on the 13th inst., a diversion from the usual monthly meeting, when twenty-four members and friends travelled by saloon car to Delamere, in the heart of Cheshire. After an agreeable walk of two miles, Flax Mere was reached, and soon cameras were at work along its rush lined shores. The route now lay through the midst of the Forest of Delamere, the dense foliage of the trees making a refreshing shade from the almost tropical heat of the sun. Mouldsworth was reached for tea, which, after the long walk, was amply done justice to.

After tea the ordinary meeting was held, Mr. F. W. Burt in the chair.

Mr. A. B. Mitchell was elected a member.

The Hon. Secretary (Mr. A. E. Casson) mentioned that arrangements had been satisfactorily concluded with the Directors of the Manchester Chamber of Commerce, which is to be the future home of the Society.

After a group had been taken, the party dispersed to ramble in the fields, and some to expose on the fine sunset. Assembling at the station, the party reached Manchester about 9.30, after a most enjoyable picnic meeting.

Croydon Camera Club.—June 17, the President (Mr. Hector Maclean) in the chair.

Pictorial Gems with a Hand Camera.

The above subject was ably dealt with by Mr. W. Thomas, who—so the President of the Club informed members—was not only distinguished for the high pictorial qualities of his hand-camera work, but was at the present time notable for his efforts, as Chairman of the Delegates, to infuse fresh vigour in the affiliation of photographic societies. Amongst the points touched upon and the opinions expressed by the lecturer, were that nearly all hand-camera work was rubbish; that the hand camera will or should do just what the brain of the worker wills; that bad technique is never good art; that a good picture may be formed out of anything; that Watkins's actinometer is a great aid to the estimation of exposure; that views should be judged through blue spectacles; that refined smudge and skilful light and shade are better than subject or detail; that chemical fog will cure bad cases of under-exposure, and much more of the like. Mr. Thomas also explained certain rules of composition, which he considered fundamental, illustrating his contentions by a number of clever charcoal sketches. He subsequently handed round and explained a very charming collection of delightful miniatures of sea and landscapes. These were all characterised by a full scale of subtly rendered silvery half-tone, with high lights and deep shadows but sparingly present, in most cases the detail was rather suggested than expressed. In the subsequent discussion the President (Mr. Hector Maclean) took exception to the remark that, "as anything would make a good picture, it is futile to hunt about for attractive subjects." The President considered that, the better the subject and the nobler its features, so much easier is the work of picture-making, so much better and attractive the result. He strongly deprecated in photography, as in painting, the teaching of latter-day innovators, *i.e.*, that the essentials of the highest pictorial art are included in technique. Capable composition and adroit handling are not sufficient, unless there be the statement of a sublime natural truth, or the indications of imagination and culture; a picture may be admirable as a decorative panel, but falls short of the highest level of pictorial expression. Others who took part in the discussion were Messrs. S. H. Wratten, J. T. Sandell, A. Underhill, H. E. Holland, and W. H. Rogers. A cordial vote of thanks accorded by a capital attendance of members concluded the proceedings. The President handed round for comparison recent examples of hand-camera work taken by Frena, pocket Kodak, and Bullseye cameras. He also presented the Club with a copy of his newly published book, *Photography for Artists*. Mr. Underhill presented all present with a well-executed group of between twenty and thirty members taken during the excursion to the Town Hall. Sixteen names were given in of those intending to visit Hatfield House with the President on the 1st prox., and it was announced that the list would be closed on the 24th inst., by which date all who intend going must notify the Hon. Secretary.

Hackney Photographic Society.—June 16.—Mr. E. J. Wall delivered a lecture on

Printing with Silver Paper,

in the course of which he advised amateurs to always buy their paper in cut sizes. Cutting up the sheets involved the risk of waste, and also the chance of spoiling the surface with finger marks. The best way to keep the paper was to place the sensitive surfaces face to face and keep the whole between pieces of strawboard, under a weight. Gelatino and collodio-chloride papers were very sensitive to light, and care should be taken not to expose them to even a small amount, either before or after printing, as, although the effect was not shown at first, it became apparent after toning in the form of degraded high lights. To prepare prints for toning, they must be immersed in running water or a solution of salt, to remove the free silver salts. For gold toning there were two methods, viz., the sulphocyanide bath and the combined bath. Both were good, if made and used properly. For the former, the Ilford Company's formula was correct, thirty grains of sulphocyanide to the sixteen ounces of water. It should be mixed in the following way: Dissolve 30 grains of sulphocyanide in 8 ounces of water; then dissolve 2 grains of gold chloride in another 8 ounces of water, and add it gradually to the sulphocyanide solution—not the latter to the gold, or the resulting mixture would be red and be unfit for use for twenty-four hours. The addition of acetate of soda and other salts to the sulphocyanide bath was of no use, and might well be dispensed with. The addition of salt to the bath made it tone more regularly, but impaired its keeping power. If properly made and used, the sulphocyanide bath could not be beaten. Some seemed to prefer the use of a combined bath; but, as it was always advisable to place the prints in a supplementary fixing bath after removal from the combined bath, the advantages of using the latter were not apparent. Combined baths, to be safe, should never contain lead, alum, or acid salts, otherwise sulphur toning, beautiful but fugacious, would result. A good formula was as follows: Hypo, 4 ounces; soda acetate, 60 grains; gold chloride, 2 grains; water to 16 ounces. The prints must be thoroughly washed first to get rid of the acid. Platinum toning was a very simple matter if the following points were remembered: Always use the preliminary salt bath, have the toning solution acid, and immerse the toned print in a solution of salt and well wash before fixing. Both gold and platinum toning solutions were sensitive to light, so they should be kept in the dark when not in use. The duration of fixing depended to some extent on the strength of the bath; but, if a solution of ten per cent. hypo were used, and this was the best, it should not take longer than a quarter of an hour, and generally not longer than ten minutes, to thoroughly fix. Washing should not be too long, one hour in running water being quite sufficient.

Aintree Photographic Society.—Twenty members and their friends had their third trip of the season on Saturday, June 20, to Llangollen, a splendid afternoon being spent in good weather. The party numbered twenty, and, though there were only half a dozen cameras, plenty of work was found for them in this delightful neighbourhood.

Patent News.

The following applications for Patents were made between June 10 and June 17, 1896:—

Colour Photography.—No. 12,645. "Improvements in and relating to Colour Photography." Complete specification. J. W. McDonough.

Frames.—No. 12,712. "Improvements in Frames for Photographic and other Picture." B. Hodges.

No. 12,772. "An improved Process or Method of and Means for Producing Designs, Written or Printed Matter, Photographs, and the like." T. Sandnal.

Kinetoscope.—No. 12,906. "Improved Apparatus for Taking and Projecting Photographs of Moving Objects." J. B. Medland and W. H. Wood.

Changing Plates.—No. 13,019, "Improvements in the Method of Changing Photographic Plates or Films in Apparatus used for the Exposure of Same." J. W. Jeyes and A. L. Adams.

Vignetter.—No. 13,040. "Salmon's Adjustable Vignetter." A. Salmon.

Kinetoscope.—No. 13,098. "Apparatus for Producing Photographic Impressions in Rapid Succession of Moving Objects and for Projecting the said Impressions for Producing Animated Photographs." P. Gautier.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE CONVENTION.

To the Editors.

Gentlemen,—Will you kindly allow me to announce to all probable Conventioners that, in addition to the lectures and papers already announced in the official programme of the Convention at Leeds, the Papers Sub-committee of the Council have induced Mr. F. W. Branson, F.I.C., to give a demonstration of *Novelties connected with the Röntgen Rays*. Mr. Herbert Denison, F.R.P.S., has consented to give a demonstration on *Photogravure*, and Mr. E. J. Wall, F.R.P.S., will demonstrate *Colour Printing by the Three-colour Process*.

It is hoped that members in large numbers will attend at the City Art Gallery for the reception by the Mayor of Leeds.' The Right Hon. W. L. Jackson, M.P. (Chairman of the Great Northern Railway), at 7.30 p.m., on Monday, July 13.

The Council also wish to invite members who attended the Shrewsbury Convention to bring with them to Leeds (or send them for selection) good slides from their Shrewsbury negatives for exhibition on the opening night.

May I also state that Messrs. Watkinson & Co., of Leeds, the largest photographic-camera makers in the world, have kindly offered to throw open to all Conventioners their manufactory on certain days, to view the different processes in camera-making; the same firm will also send on all excursions, for use, free of any charge to Conventioners, a commodious dark room for changing plates. R. P. Drage, *Hon. Secretary.*

95, *Blenheim-crescent, London, W.*

LONDON VISITORS TO THE CONVENTION.

To the Editors.

Gentlemen,—It is generally known that reduced fares are this year out of the question, but there might be some advantage for a party travelling together, such as a saloon carriage or at all events reserved compartments. If those intending to go from St. Pancras (Midland) on Monday morning, 13 July, will communicate with me promptly, I will do my best to make the journey to Leeds as comfortable as possible.—I am, yours, &c., Walter D. Welford.

15, *Farringdon-avenue, London, E.C.*

PHOTOGRAPHING AT THE NATIONAL GALLERY.

To the EDITORS.

GENTLEMEN,—Having followed with interest the recent correspondence in your JOURNAL relating to photographing pictures in the National Gallery, I should have liked at the time to have trespassed a little on your space, treating the subject from the professional standpoint. Perhaps it is not now too late.

Shortly, my experience is this. Armed with the necessary permit, I visit the Gallery to see the situation of the picture. If it is not too high up and with a movable glass, all is well; but, if it is a fairly large work with a fixed glass, it breeds trouble and red tape of an antiquated width and length. In this manner I interview Mr. Eastlake or Mr. Ambrose, and say that I could do my work satisfactorily if the picture could be removed from the wall and taken from its frame. In nineteen cases out of twenty this reasonable request is refused. I say reasonable, because of the already existing permit to photograph the picture. I am told that I can instead erect a black screen. In two quite recent cases this meant putting up one twenty-four feet by twelve, blocking up more than half the room, preventing six students from working an entire morning (they were not nice about it), and wishing generally that I had not been born. While the exposure was going on, amiable visitors would stand steadfast in light raiment between the screen and the work. My assistant, not being a polyglot policeman, got tired and struck at the task of "moving on," so I was obliged to swear myself in, in as many languages as I could muster.

If the picture had been removed from the wall, the whole affair would have been finished in an hour, and no one would have been interfered with. It is no question of expense, as clients are willing to pay the necessary costs to obtain the best results.

What makes me kick so much at this nonsense is that, while I am struggling and getting hot, the Gallery attendants are removing large pictures from the walls at the rate of about one per hour, to be photographed by a Continental firm, who, besides having this that is denied an English firm, have also, and have had for nearly two years, more than two-thirds of the largest room in the Gallery walled off for their *sole use* as a photographic studio. Please, sir, do not think me a man with a grievance. My only regret is that public servants, like the National Gallery Trustees and officials, have such an un-English sense of equity and fair play.—I am, yours, &c., GEORGE P. NEWMAN.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

William Arthur Skill, 9, Magpies-square, Lincoln.—*Two photographs of subsidence of the River Witham embankment, city of Lincoln, Nos.* 1 *and* 2.

William John Bishop, King's College Hospital.—*Photograph of men picking stone underground, taken by magnesium light. Photograph of man sawing stone underground, taken by magnesium light. Photograph of men at work with underground crane, taken by magnesium light.*

W. P. D.; PAPER; W. A. T. Received too late; in our next.

GEO. BANKART.—Thanks; we have not the address at hand, but have elsewhere utilised the information, which will, no doubt, thus reach the gentleman named.

CRYSTAL PALACE.—AMATEUR. Photographing in the Palace and grounds is not allowed, as the sole right of doing so is disposed of to Messrs. Negretti & Zambra.

COPYRIGHT.—C. R. J. If there is no copyright in the portrait, as there would not be if you took it in the ordinary course of business, you are not entitled ao stamp the mounts "copyright." It would be a misrepresentation.

BAD LIGHTING.—T. H. W. The flatness in the portraits is due to the lack of shadow. This is fully accounted for if there are only white calico blinds to stop out the sun from the south side while the sitter is supposed to be illumined from the north side. Put dark blinds—say, dark green or black—on the south side, and that will get over the trouble.

EMBOSSING.—T. SYMMONDS. Send us an example to see. Embossed prints may be produced without any costly appliances, but we do not quite understand from your letter the kind of embossing you mean.

MATT OPAL GLASS.—W. TAIT complains that the ordinary pot opal glass is of too coarse a surface for the purpose he requires it, and asks how to get it finer.—We have little doubt that any glass merchant who makes a speciality of this material will supply it with a finer grain. If not, he will have to grind it himself, with fine washed emery, in the way he proposes.

THE R. P. S. EXHIBITION.—H. A. AYLWARD says: "I have a photograph I should like to exhibit at the Royal Photographic Society. Can I do so without being a member? Would you kindly give me particulars through the JOURNAL?"—In reply: You can exhibit without being a member. Full particulars relating to the Exhibition are printed in the JOURNAL of June 5.

ENGRAVED BLOCKS FOR MOUNTS.—P. DOLAN. If you have had brass blocks specially cut for printing the mounts, we consider the price charged for them reasonable. From the tone of your note, we imagine that you did not place the order for the mounts with those who make a speciality of photographic mounts, but an ordinary printer. If that is so, the cost is fully accounted for.

STAINS ON NAILS.—J. P. U.—The stains are difficult of removal from the nails—if not impossible—if they are so deeply seated as yours would seem to be. Those from the flesh can generally be got rid of by treatment with a strong solution of bleaching powder, followed by pumice stone. The bleaching solution will also help with the nails. Why not avoid the stains altogether by more careful manipulation, or by the use of indiarubber finger stalls?

RETAINING SPECIMENS.—OPERATOR. As you have written twice for the return of the specimens, and got no answer, we should advise you, if you do not receive them by the time you see this, to write to the Superintendent of the district in which the advertisers reside. We have had no complaints of the people before; but, if the facts be as said by your friends, they are liable to prosecution for fraud. If by this time you have not got your pictures back, put your case, and the statements of the others, before the Police Superintendent.

COPYING ENGRAVINGS.—PORTRAIT PHOTO writes: "I have had three very old engravings sent me to copy, the paper of which is very yellow—India paper. I have made several negatives, but cannot get sufficient contrast between the yellow paper and the black ink. I use the ordinary plates, not the rapid. Can you give me a tip?"—Either get plates orthochromatised with eosine, or treat some ordinary ones accordiug to the formuke given in the ALMANAC. Greater contrast would be obtained by, instead of using "ordinary" plates, employing those specially for photo-mechanical work, if orthochromatic ones are not used.

STARCH PASTE.—S. WATSON writes: "We have to mount from 100 to 150 photographs every day, and we find that the starch goes watery after a couple of days, and gets mouldy, and won't stick, a lot always has to be thrown away, which is waste. Is there anything we can add to prevent it going bad?"—Antiseptics may be added, which will prevent the mould; but anything of the kind is not to be recommended while starch is so cheap and its paste so easily made. We should advise our correspondent to make up the paste daily (sufficient for the day's use), and throw away what is left over. Decomposed mountants are a fruitful source of fading photographs.

GOLD SOLUTION.—W. BOURNE writes: "I have a large bottle of solution of chloride of gold, which has been in the place for several years. I do not know how much gold it contains, but I believe it originally came from an electro-gilder's. When I have tried it for toning, I can do nothing with it. Will it be best to send it as it is to a refiner's to get out the gold, or throw that down myself and send the residue only? If the latter, how?"—Yes. Add to the gold solution a filtered solution of protosulphate of iron, acidified with sulphuric acid, until no further precipitate is produced, wash in several changes of water and dry. The result is practically pure gold, and for which you ought to receive something over 4*l.* per ounce.

STUDIO, DESIGN FOR.—SIDE LIGHT. The proportions of the proposed studio are very good, but we are not at all taken with the lighting of it. There should be much more side light, and corresponding in position with that in the roof. The studio would also be improved by being a foot or so higher at the ridge, and six inches or a foot lower at the eaves. This will give more slope to the roof, which will then the better be made watertight, and have less risk of breakage in case of heavy hailstorms. If the sketches are approximately to scale, the lighting will be, practically, all top light. We should recommend that the side light be continued down to, say, three feet six inches or four feet of the floor. Messrs. Marion & Co. have a small work on the subject.

USE OF ROYAL ARMS.—LOYAL writes as follows: "I was greatly surprised to find, in your current issue, that having supplied royalty with portraits did not permit the use of the royal arms, and must thank you for warning given. Kindly let me know, through your valuable paper, does having supplied a member of the English royal family with a photograph (which was accepted), and receiving a letter of thanks in her name, allow me to use the words 'patronised by royalty,' or 'under royal patronage,' without the royal arms?"—Under these circumstances our correspondent is certainly not entitled to use the royal arms. We scarcely think him right using the term "patronised by royalty," inasmuch as the work was not, apparently, executed to the order of royalty. It was simply accepted. However, we do not see any *illegality* in the use of "patronised by royalty," if the royal arms be omitted.

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EX CATHEDRÂ.

Messrs. Wellington & Ward are placing on the market a specially prepared bromide paper for negative work. The half-plate size will be sold at 1*s.* 6*d.* per dozen. We have had submitted to us a number of negatives made on the paper, and their comparative freedom from granularity is a point that must tell in its favour. Mr. Wellington also demonstrated to us how, by giving the back of the paper a very brief exposure to light before development—say a second, to the dark-room lamp—the granularity of the paper is practically inappreciable when the image is developed.

* * *

In our article of last week on *Slow and Fast Plates for Hand-camera Work*, we remarked that, if a magazine hand camera could be arranged to carry two different kinds of plates, so that either could be exposed at will, it would often prove an acquisition. Mr. Frank Miall, of 13, Shelgate-road, Clapham Junction, draws our attention to the fact that the Focussing Facile hand camera fulfils these requirements. Several rapidities of plates can be carried in it at one time, and any of these can be brought opposite the lens for exposure easily and without complication.

Answering a correspondent last week on the subject of coarse-surfaced matt-opal glass, we expressed the opinion that glass merchants would supply it with a finer grain than that which it ordinarily has. Messrs. Moores, De Saulles & Co., of Wordsley, near Stourbridge, send us a sample of extremely fine-ground matt-opal glass, which we think quite fills our correspondent's requirements. Others besides him may be interested in knowing that Messrs. Moores are prepared to meet a demand for fine-ground opal glass.

* * *

Messrs. Wells & Co., of Avenue-road, New Southgate, have sent us some specimens of their work in postage-stamp portraiture, and they remark that they believe they were among the first to supply this kind of production to the profession in this country. The little prints are admirably done, and they are cheap.

* * *

A "photographer of twenty-five years' experience" draws our attention to the fact that the Salvation Army are entering into rather sharp competition with professional photographers. He says: "I would very much like your ideas about the enclosed. Hasn't this sort of thing a very baneful effect upon photographers, and been the cause of such bad prices prevailing? It seems very much on a par with the pound of tea with a cream jug thrown in. I am much surprised at this emanating from the Salvation Army of all places in the world. In rescuing the submerged, are they not submerging some of the rescued? Allow me to ask how many customers will they expect at this sale? They say, *Come in thousands*. How are they going to do these thousands?"

* * *

Two circulars are enclosed with our correspondent's letter, from which it appears that a great trade sale was held last week at the Army's trade headquarters, 98–102, Clerkenwell-road, and among the inducements to seekers after bargains was the statement that every purchaser would be presented with a free cabinet photograph of himself. An advertisement in the *War Cry* alleged that the meetings were crowded, and that the photographer's hair was turning grey. We are at one with our correspondent's criticisms; but it is well recognised that the Army is largely, if not almost entirely, a trading concern, and rather prone to "cutting" and underselling in various branches of industry, so that there is no cause for surprise

that photography has been added to the list of trades that have had reason to protest against the business methods of "General" Booth's organization.

* * *

Writing from 38, Great Queen-street, W.C., Messrs. Wratten & Wainwright issued, last week, the following notice of removal: "In consequence of the expiration of the lease of our warehouses and offices as above, we propose to discontinue, as early as practicable, the retail of photographic apparatus and sundries, and to confine ourselves henceforth solely to the manufacture of the 'London' dry plates at our factory at Croydon." Messrs. Wratten's sole address is now Croydon, Surrey.

* * *

The Council of the Society of Arts have awarded a silver medal to Mr. A. A. Campbell Swinton for his paper on *Röntgen's Photography of the Invisible*. Mr. Swinton's paper appears in The British Journal of Photography for March 13, 20, and April 3 last.

* * *

A number of prints made from negatives taken by means of the X rays have been shown to us by Mr. W. I. Chadwick, of 2, St. Mary's-street, Manchester, who was one of the earliest in the field of the New Photography. Mr. Chadwick's results are certainly the finest we have seen, being well exposed and sharply defined throughout. Many of his studies of hands, arms, legs, and feet are interesting from a surgical point of view, besides appealing to us as excellent examples of X ray work. One of the greatest curiosities shown to us was the picture of a hand with a double thumb, with which, we are assured, the owner could write or pick up a pin. Mr. Chadwick's results are all on large plates; thus the hand and the arm, the leg and the foot included on one plate, are invariably shown. These large pictures have, we believe, the preference with many medical men and patients.

A POINT OF COPYRIGHT.

The case, on appeal, reported in our issue last week, is an important one to photographers, inasmuch as it reverses the judgment of the Sheffield County Court Judge, who decided that, as the defendants had permission to reproduce a photograph in their paper, they were entitled to issue it as a supplement, and also sell it separately from the paper. The result of this appeal again makes it clear that, when permission is given for one definite purpose, it does not extend to any other. Although the law is now clear on this subject, photographers should, in granting a right of reproduction, always make a distinct stipulation to that effect, as per the forms issued by the Photographic Copyright Union, as then there can be no possible misunderstanding in the matter, and legal expenses may be avoided.

There is one point that should always be kept in view when giving licence to reproduce a work, namely, the effect that the reproduction may have on the sale of the photographs. In the case referred to the supplement was a separate picture, and, of course, could be mounted or framed, and thus take the place of the photograph. The same, of course, applies to the large supplements issued with the Christmas and summer numbers of the illustrated weeklies. Some of these are now printed so well, and in such close imitation of photogravures, both in colour and size, that they, when framed and glazed, might well be mistaken for them by a certain portion of the public. This, one can well imagine, must injure the sale of the work, if afterwards published, as an expensive reproduction.

A friend of ours tells us that he recently saw in a shop window a number of small reproductions, framed and glazed, of works now being exhibited in the Royal Academy, the price being about a couple of shillings each, though the frames were only worth a few pence. The prints were recognised as being taken out of the annuals, published yearly, at the opening of the Royal Academy. Of course, the artists or the owners of the copyrights had not given permission for the reproductions to be used in this way, but there is no law, so far as we can see, to prevent them being so used, as any one purchasing the work can do what he likes with the pictures in it. As the prints in some of these annuals are now so good, utilising them in the way mentioned must necessarily militate against the sale of the small photographic reproductions of the same works when issued.

Scientific Kite-flying.—The kite promises to be of great use in scientific observations, from its portability and the readiness with which it can be used for observations from a considerable height. It has been used with a small camera affixed, though the most recent kite work has been devoted to meteorological recording. In the latest ascents, an altitude of almost a mile has been attained. These kites, as explained by Mr. R. de C. Ward, of Harvard University, are not made of the usual form, but box-shaped, with ends open and sides covered partly with silk or cloth. It is stated that a very fine piano wire is used instead of twine. They make splendid flying instruments.

Weather-prognosticating.—Nothing is more unsatisfactory in connexion with photographic tours than a thunder shower; but, according to Mr. B. Woodd Smith, writing in *Nature*, there is one sky sign which, when present, infallibly foretells thunder within twenty-four hours. "It consists in the formation of *parallel streaks* of cloud, seldom more than three or four in number, definite in form, and limited in extent and duration, appearing either as white streaks on the blue, or more rarely as darker streaks against nimbus or cumulo-nimbus. I have rarely seen these parallel bars, as I have come to call them, without their being followed by thunder within twenty-four hours." It appears that the first description of this prognostic appeared in *Nature* in 1888.

The Eclipse Observation Arrangements.—A slight hitch, which, however, it is not supposed will interfere with the projected arrangements, has happened in connexion with the vessel, the *Volage*, carrying Mr. Norman Lockyer and his equipment. She has been detached from the training squadron, and is now undergoing repairs at Portsmouth. All the ships of this squadron are to proceed to the neighbourhood of the Valanger Fiord, to observe the eclipse. Novaya Zembla will be the station for the Russian observers, and, as Sir George Baden-Powell has offered his yacht for the purpose, it is probable that English observers will also proceed there. The Harvard College expedition goes to Japan, their special object being observations by a large prismatic camera.

Dr. Hugo Schroeder's Corrector.—Dr. Schroeder describes in *Photographische Mittheilungen* the use that can be made of a compound lens with external plane and parallel surfaces, the component lenses joining internally at surfaces of any suitable curvature. The simplest form may be produced by the aid of an ordinary achromatic plano-convex lens ground to a plane on the curved surface. It would then have almost the same spherical and chromatic aberra-

tions as the removed plano-convex portion, but with opposite signs. The character of the lens may be reversed by substituting crown for flint, and *vice versâ*. Such a lens, placed in the cone of rays from an objective, would indicate the effect producible by altering the curves of the latter. By its aid an ordinary telescope (achromatic, of course) can be utilised for photographic purposes, but the field of view will be very restricted unless the corrector be made of as large a diameter as the objective itself.

Cycles as Studio Accessories.—It is, or used to be, common enough for photographers, in some parts, to be provided with costumes of the country, to take visitors' portraits in. For example, we have a portrait of the late Mr. Baden Pritchard, in Arab costume, taken on the occasion of his trip to the great Sahara, a stock dress supplied by the photographer. The late Mr. Adam Salomon also had a stock of "property" dresses, mostly of velvet, for the use of sitters. Cycles now, it would seem, have become a photographic "property," for we noticed in the window of a well-known photographic firm at the West-end, the other day, the following announcement: "To lady cyclists. Ladies photographed on bicycles. Machines kept in the studio." This is certainly a novelty, and, we have little doubt, attracts some additional business. It certainly saves ladies bringing their cycles to the studio. It may also induce some to be taken on a machine who have never mounted one before, just for "the fun of the thing," or to see how they would look on a bicycle. As the cycle is such a *furore* amongst ladies just now, we shall not be surprised to see other houses following the example set, and introduce cycles as accessories in the studio.

A Curious Obliteration of the Photographic Image.—At the meeting of the Photographic Club last week a curious instance of the disappearance of a collodion picture was shown. It was, or had been, a micro-photograph of the Hon. Secretary; but in the course of a few days, although protected by a cover glass, the image had entirely disappeared. It was explained that the minute picture was developed, fixed with cyanide of potassium, and washed in the ordinary way, the latter operation being more carefully performed than usual. The thing seemed very mysterious at first, but it was elicited that, instead of the cover glass being cemented on with Canada balsam, a few drops of Sœhnee photographic varnish was used. This varnish, it was explained by some of the old collodion workers present, is made with very strong spirit, and some kinds of pyroxyline are soluble in very strong alcohol, as turned out to be the case with that used for the collodion in this instance. When the thin cover glass was pressed on, a certain portion of the spirit was imprisoned and could not escape. It then had a prolonged solvent action on the collodion, so that in the end the particles of silver which had formed the image became diffused in the film, and so it became effaced.

A Scenic Artists' Trades Union.—A meeting of scenic artists was recently held in the neighbourhood of Covent Garden to protest against the "cutting prices" in the profession. After discussing the subject for some time, it was resolved to form a union for self-protection. A correspondent, in calling our attention to this matter, says, if scene-painters and those engaged in stage effects can form a trades union, why cannot photographers' assistants? The query is certainly a pertinent one, though the two cases are not quite parallel. To become a scene-painter or a scenic artist requires considerable training and art knowledge very different from that required now by photographic assistants, such as those whose grievances have recently been so ventilated in these columns. Moreover, we fear there is not sufficient unity amongst the latter; that has always been the case with photographers, both employers and *employés*. Some time ago there was a meeting of "process workers" to fix a minimum price for blocks, and, although the principal towns agreed on one, it has not influenced the "cutter" of the "garret-master" type; he still "cuts" as low as ever, if not lower. It is a pity there is not more unity amongst photographers in the different branches than there is.

Has Amateur Photography Reached its Zenith?—When a thing has reached its height, it is generally said to subside. Is that the case with amateur photography? This question occurs to us from the fact that apparatus-makers, dealers in materials, and others who cater more especially for amateurs, complain that trade is not nearly so good this season as it has usually been for several years past. This complaint is not confined to the metropolis, but extends to the provinces as well. What is the reason? That given by one and all that we have spoken to on the subject has been the same—the craze for cycling. People, it is said, now prefer to lay out their spare cash on the latest thing in cycles who used to spend it in photography. Cycling has become a fashionable hobby amongst both sexes, and promises to stay. Many entered the ranks of amateur photography, not for the love of the art, but simply because it was fashionable. Such people, however, must not be classed as the genuine amateur photographers, for they are ready to change their hobby for the next fashionable craze. They were, however, good customers to apparatus-manufacturers, as well as plate-makers, and they are now missed. The cycle and camera used to go hand in hand, but now the latest phase of cycling, with both sexes, seems to be "scorching" along the road on the lightest and latest machine, regardless of the picturesque.

Röntgen Sciographs of Bullets in the Head.—At a recent meeting of the Paris Academy, MM. E. Brissand and Londe exhibited photographs, by the Röntgen rays, of a bullet lodged in the brain. Last Friday, Li Hung Chang visited the Charlottenburg Polytechnic, and, after being shown a number of experiments with the New Light, consented to an attempt being made to discover, by means of the rays, the position of the bullet fired at his head by the assassin at Shimonoseki last year. The image of the head which was obtained shows clearly the track of the bullet in the left cheek, and the bullet itself lodged in the tissues slightly below.

Important Suggestions for Improving the Vacuum Tubes for Röntgen-ray Work.—Mr. T. C. Porter, of Eton College, in a lengthy communication to *Nature*, indicates a series of improvements in the use of the focus tubes which promise to improve the rapidity and sharpness obtainable with the ordinary tube. The following extracts from his letter contain the practical parts of his article.

"After examining the fluorescent and photographic action of the rays (X_2) emitted on strongly *heating* a 'focus tube,' and finding them different to the rays which have been hitherto noticed (X_1), in that the relative transparency of flesh, bone, aluminium, and glass differs for the two kinds of rays, it seemed desirable to try the effect of cooling the tube. Solid carbon dioxide and ether, and then solid carbon dioxide alone, were employed, with the result that in both cases the fluorescence of screen and tube very rapidly died out, and the current apparently failed to pass through the latter; as the tube gradually grew warm again, the fluorescence in it returned, not gradually, but very suddenly, at a temperature not very far below that of the room, the glass lighting up brilliantly, and the shadows of the bones showing on the screen with increasing distinctness, the emission of X_1 rays reaching a maximum at about 12° C. (a rough guess). On further heating, X_2 rays begin to be evolved, judging from the increasing opacity of the flesh, whilst at the same time the fluorescence excited on the screen grows rather brighter, until the state recorded in my paper of June 4 is reached. As the condition for the maximum of X_1 rays probably varies to a certain extent with the different forms of tube, and even different specimens of the same kind of tube, with the degree of exhaustion, &c., it seems to follow from these experiments that, in some cases, warming the tube slightly might be useful in photographing the bones, whilst in others moderate cooling would be better; and from the accounts of various operators such would seem to be the case, though, as will be seen in the light of subsequent experiments, the particular method of heating or cooling is an important factor in the result. Solid carbon dioxide seems very opaque to the rays when its low density is considered, but the effect may have been partly due to the frost condensed upon it from the air.

"During some experiments on the tube with an 18" Wimshurst

machine, I noticed that the X_1 rays, *i.e.*, those showing the bones best, seemed to be emitted or not according as a brush discharge occurred on the wire leading to the anode of the tube, close to the tube, or not; and that the 'electric wind,' which blows from the tube as from all charged bodies, seemed also to vary in intensity with the X_1 ray flashes, the X_1 rays being most copiously emitted apparently at the moment when the brush discharge ceased or the wind moderated. I soon found that by making a small brush on the wire near the anode, or drawing one with the finger from various parts of the tube (but not from all), best from the circular section of the tube in a plane with the edge of the kathode mirror, or in the very immediate neighbourhood of this line, the discharge producing the X_1 rays could be induced at will in a tube which was not otherwise giving them, or, at any rate, only giving them very feebly. Thinking, therefore, that the production of the X_1 rays must be in some way connected with intermittent leakage of the charge which resides on the outside of the tube (a continuous drain stops fluorescence and the emission of any rays capable of exciting my fluorescent screen altogether), I tried various ways of drawing off this charge intermittently, with several curious results; but the plan I find to work best is to place a ring of plain copper wire round the tube in the plane of the kathode mirror's edge, not touching the glass, but very near it, and then to cause a very rapid but intermittent discharge by bringing a wire connected to earth within a *very small* distance of some part of this ring; so far I cannot discover any particularly favourable position. The sparks between this ring and the earth wire are very small, but the effect on the fluorescent screen exceedingly striking.

"What is still more interesting is that not only is the discharge of X rays made much more regular (when the adjustment of the ring and wire is carefully made), but *the X rays can thus be induced in a tube with a far weaker current;* the weakest current capable of inducing sparks between the ring and conductor seems capable of giving the X rays, though they are more copiously emitted with a stronger current.* And not only so, but the tubes I have experimented with seem to show as yet no symptoms of growing fatigued. I have caused a brilliant emission of the X rays from a tube which was before 'fatigued,' at least, my coil seemed too weak to excite it, and the emission of X_1 rays has been sustained for over two hours with but a few short intervals without showing any signs of diminution, judging by the screen effects; but, on the withdrawal of the ring and wire, it at once failed to give any. This seems an important result, for it must greatly shorten the exposure and fatigue necessary for the photography of thick objects, and also greatly save the expense of the operations.

"In one experiment I placed a ring round the glass in the plane of the concave mirror of a Crookes' tube, showing the 'independence' of the positive pole, from which I could not get any X rays, and found, on extracting a series of small sparks from it with a wire leading to earth, a very decided increase in the still general fluorescence of the tube, but it gave no rays. Incidentally it was noticed that, when a wire brush connected to earth was pressed lightly against the glass over the dark spot opposite the kathode, in every place touched by the wire, a most brilliant green fluorescence was excited, which faded away very quickly when the brush was withdrawn. It is therefore certain that much may yet be done to increase the efficiency of the tubes used for the production of X rays by a further study of the action of neighbouring conductors upon them.

"*Addendum*, June 13.—After trying various forms of conductor, coating different parts of the X ray tube with Dutch gold and aluminium leaves, I find the following a most effective plan, and feel no hesitation in recommending it. First coat the external part of the tube between the kathode wire loop and the aforementioned plane of the edge of the kathode mirror with any conducting metallic leaf, being careful that none of it projects beyond the trace of this plane on the glass of the tube. Next coil a stout piece of copper wire into a circular loop with a stem, and place it so that, whilst the loop is in the plane of the edge of the kathode mirror, it does not touch either the glass of the tube or the metallic coating. I find an interval of about the one-twentieth of an inch answers excellently. And, lastly, instead of using a wire to earth, bring the stem of the looped wire, or, better still, a more pliable piece of wire connected with the loop stem, within a very short distance of the part of kathode wire from the coil close to the tube. The adjustment is easily made in practice, and the emission of X_1 rays which follows will, I think, be found satisfactory, to say the least, especially when it is remembered that, without the looped wire, the tube may be giving no X rays at all."

* I have succeeded in eliciting feeble X rays from a Newton's focus tube with a small coil giving only one-third of an inch spark, using the ring and earthed wire or finger.

DIGRESSIONS.

VII.—Some Heresies about Portraiture.

In every work of art there is something more required than fidelity to facts, whether the work is painting, literature, music, photography, or any other creative art. In speaking of novel-writing Sir Walter Scott, who was a genuine art workman, expresses this fact very clearly. He says: "Though an unconnected course of adventures is what most frequently occurs in nature, yet, the province of the romance writer being artificial, there is more required from him than a mere compliance with the simplicity of reality." It is evident that this opinion obtains even among the writers of history, whose mission, judging superficially, one would think would be facts, but whose first thought, apparently, is the decoration that shall be hung on to the facts, and whose first rule seems to be, "picturesque certainly, true if possible, and if it suits me." All arts are only variations of one, and I don't see why photographic portraiture should be treated as an exception. We don't want the anatomical facts of a man, the hairs of his beard, the freckles of his skin; we want the air, the spirit, the character, the "go" of him. Likeness we must have; but, if we get character, our faithful art will take care of the likeness. There has always been too much insistance on the petty details of a man's face. Who cares for Cromwell's wart? The anecdote tells us something of the mind of the man, the wart itself nothing. It has been a stock exclamation with photographic writers, "What would not the world give for an untouched portrait of Shakespeare?" Why should we desire it? If I may judge from my own feelings, we don't want anything of the kind. We have been brought up with the existing portraits, and we no more want to have our fixed ideas of him altered than we want a wicked American to prove that his divine plays were written by Lord Bacon.

For my part the first portrait of Shakespeare I met with—some time in the last half century—was a copy of the *Droeshout* in the first folio, next the Stratford-on-Avon bust, and I don't think my life felt quite fulfilled until I had acquired a copy of the original plate of the engraved portrait and a cast of the bust. They agree sufficiently well as a likeness to show they are not copies, and they represent the man I have all my life believed to be the poet, and I don't want to change him. I have to put a surprising restraint on myself to prevent this becoming a stupendous digression, for I should like to say a lot about the collection of those various editions which have nothing to do with photographic portraiture.

But, if we don't get the facts, we want the effect. The greatest portrait painter we ever had, Sir Joshua Reynolds, never minutely copied the features, but he gave us the man at his best, and he usually convinces us, who never saw the original, that it is a "wonderful likeness;" witness the portrait of *Lord Heathfield* in the National Gallery—surely nobody would venture to say that that was not like. This is a very characteristic example of Sir Joshua's method of portraiture. He seldom represents his figures in fixed attitudes, but sets them "in the midst of active life as if simply interrupted by the artist's arrival."

In one of his lectures Constable spoke of this noble work, and showed how much meaning, what a history could be put into a portrait. He described it as "almost a history of the defence of Gibraltar. The distance, with a glimpse of the opposite coast, expresses the locality, and the cannon pointing downwards, the height of the rock on which the hero stands, with the chain of the massive key of the fortress twice passed round his hand, as to secure it in his grasp. He seems to say 'I have you, and will keep you!'" This, with the determined expression of the grand old man, makes a portrait picture worthy of the photographer's earnest consideration—if not imitation. It is not every man who is worthy of having his history painted in his portrait, neither are such elaborations of thought and manipulation of accessories adapted to our art.

Every professional portrait photographer must have noticed what has probably been to him an experience difficult to explain. We will suppose he has sent home three or four proofs for selection—two or three of them which he thought the best, retouched, mounted, and finished. He may have set his mind on one to be specially proud of, yet in the resulting order the prints which he thought best were rejected, and the number required ordered from the one proof that

was included on the off chance that a copy or two might be ordered. This is not a rare instance but happens continually, and the lesson to be deduced from it is, that there are some natural qualities in a portrait which will excuse defects and supersede a good deal of the artfulness which is not art.

It is not possible to consider your work too seriously, but it is very possible to make too much parade of being careful, or, indeed, of really taking too much care. Care is said, by the best authorities, to have had the good fortune to kill a cat, and too much show of it in the operator certainly takes it out of a sitter. The same thing has happened in painting. It is related in Redgreave's *Century of English Painters* that "Lawrence was fettered latterly by his very fastidiousness and desire of surface finish, as well as by his endeavour to give the most polished aspect of his sitter." Reynolds and Gainsborough, the latter more especially, struck off some of their best portraits at a single sitting.

It seems almost immoral to say a word against hard work, but much mischief is done by over-elaboration. I would, however, rather put it that in portraiture the work is done in the wrong place. Broadly speaking, the work should be done before you come to the camera.

Here I am off on a digression. I noticed with many photographers, landscapists as well as portraitists, that they can only see their picture on the ground glass. They would find it much more convenient if they would learn to see their composition in nature, and refer to the camera only to see that the right amount is included in the field, the head in the right place, and for focussing none of which should require much correcting at the last moment. In the case of a portrait these operations should take as short a time as possible. Anything in the shape of flurry or doubt is distressing to a sitter. It ought not to be necessary to say this, but it has been my observation that photographers sometimes *take too much care*, which often takes the appearance of flurry and doubt. They must try this, and try that; have practical demonstration in the camera of how the face looks in profile, three-quarters, or full, and often feel it difficult to decide, and must have another look, and all the time the sitter is *wasting*. All this should have been settled long before the victim sat down. The clever conjurer never gives you time to find out his tricks. I must admit there is sometimes a little danger the other way. Some old ladies are quite capable of accusing a photographer of not doing enough work for his fee, although his skill has probably secured an almost impossible portrait of a difficult sitter.

Those from whom the artist hides the art seldom take into account the awful amount of talk, and shall I say humbug, that has to be let off before what they think is all that happens begins.

I am sorry to say that many photographers think they know all about portraiture because they can take a photograph. Will it seem much of a paradox if I say portraiture is quite a different business from photography, and that photography is only one of many means of producing a result? All portraitists, whether they use photography, paint, pencil, or marble, should have the same qualifications with their individual technicalities added—the same instinct, the same knowledge of human nature, the same shrewdness of observation, and knowledge of established rules of art, or, in other words, what arrangement of lines and masses will make the best effect.

Here I am off down a new siding. Some years ago, about a dozen I think, a loud but inadequately informed voice denounced rules of art as conventional. Now a shrewd philosopher has noticed that, when once a general statement has been brought into a sort of convenient formula, it is repeated and echoed by persons who have no clear idea of its meaning, and frequently adopt it in circumstances with which it has little connexion, which may account for many eccentricities of fashion. Certain it is that the denunciation of the established rules of art has not only abated, but these convenient conventionalisms are being looked on again with some respect. Although Sir Joshua Reynolds's discourses have been quoted until we almost know them by heart, as they deserved, I may do worse than tell you again what he has said about study, and those who have the folly to begin by presuming on their own sense:—

"I would chiefly recommend that an implicit obedience to the rules of art, as established by the practice of the great masters, should be exacted from young students; that those models which have passed through the approbation of ages should be considered by them as perfect and infallible guides, as subjects for this imitation, not their criticism; for it may be laid down as a maxim that *he who begins by presuming on his own sense has ended his studies as soon as he has commenced them.*"

The photographer who wants an excuse for not doing his possible best will say, "This is very lofty talking, but many sitters would never make pictures, however well treated. This is very true, and I admit that in these hard times they cannot be turned away. Adam Salomon rigidly selected his sitters, but that method is not open to every photographer; but I do ask every photographer to qualify himself for doing much better than he has ever done, in a better manner, and to *charge accordingly!*

H. P. Robinson.

BY THE WAY.

This is the season when we are naturally led—in thought, at least, if not in actuality—into the open air rather than to the meeting room, and when, in fact, photographers are to be found engaged in practical camera work rather than in the discussion of technical points before the societies. Yet what a change has taken place, even in this respect, during the past few years. We do not need to look back very far to find a time when the most ardent devotee of photography, if he happened to feel a longing for the stuffy meeting room of his club or society in preference to the breezy mountain side, would have found it impossible, within the boundaries of the three kingdoms, to gratify his wish during the present and next two months, for I believe I am correct in saying that there was not a single society existing that did not close its doors, so far as evening meetings are concerned, for at least two or three months of the year. But now, whether it be owing to an increased love for the technicalities, a spread of social feeling, or an alteration in the nature of our meetings, I cannot say, scarcely a town of any importance but has at least one meeting a week, even during the dog days, while in some of the great centres, but especially in the metropolis, it would not be difficult to fill in every night in the week with photographic recreation (?).

Then, as if the regular meetings did not suffice to satisfy the craving for science and sociability combined, we have a sort of extra festival in the shape of the Convention, where outdoor work and pleasure are combined with technical meetings and talk, rather, it must be admitted, to the disadvantage of the two latter. I may or may not be present at the Convention, but if I am I shall be strongly tempted to raise, or cause to be raised, the question of meetings generally, not so much from the point of view of their over-frequency or the reverse, nor of the scientific *versus* the sociable, or, as it has been irreverently described, "the beer and tobacco" side of the question, but simply and solely from the point of view of reporting.

I have for a long time personally felt a strong desire to grumble at things generally on Wednesday, Thursday, and Friday mornings, when I open my photographic papers and find so very small a proportion of matter that I do not pass over unread, simply because it is matter that is as old as the hills, and, if it were not, has no earthly interest for me or anybody else beyond the Secretary of some distant village society, or, possibly, some happy individual who, having made his *début* as the reader of a paper carefully compiled from available sources, is pleased to see it and the discussion thereon well "displayed" by his friend the Hon. Secretary. It is an excusable kind of feeling, I know from personal experience, and, though time has done much to soften the pangs of disappointment in my own case, I shall never altogether forget the feelings of pleasurable excitement of hope and, shall I confess it, of disappointed surprise that attended my first "paper," read before a photographic society in the good old days of stiff formality. No matter what the subject was, but it was one that at the time was exercising the public mind considerably, and it had pleased the Hon. Secretary and Committee of my Society to think, or profess to think, that I could throw some light on it, and I undertook to read a paper at the next meeting.

The eventful evening arrived, and so did I, but it was not long ere I recognised that I had done a distinctly unwise thing in inviting some half-dozen non-photographic friends to witness my triumph. Somehow I did not seem to care twopence for the whole Society, President and all, but those half-dozen "laymen," with the scarcely suppressed air of expectant amusement that wreathed their countenances, completely upset me, and I am afraid the performance was not an elocutionary success in any sense, and my outside friends themselves confessed afterwards that even they pitied me. However, when it was over, a feeling of satisfaction came, which was slightly dashed when no mention of my paper, or even of the meeting, was to be found in the local prints. In due course the meeting was reported in the only two journals then existing, and one of them published an abridgment of the paper without any comments, the other ignored it altogether, and from that day to this neither the *Times*, nor any of the papers that occasionally take cognisance of scientific matters of more than ordinary importance has had the slightest reference to the matter.

But that was in the days when the whole of the photographic meetings of the year could have been comfortably squeezed into a week, and not have made so crowded a time as the present, and there would have been some excuse for making "copy" of my unfortunate paper and the discussion thereon, but now I should really not expect it. Then, again, there is another matter to be looked at. Under the Affiliation scheme we may expect papers to be read over and over again, and though, if printed *once*, I scarcely imagine they would be reprinted if read a second or a third time, yet the mere repetition of the fact is irritating and unnecessary.

But this is not so bad as to notice, as I have done no less than *three times* on a single page in the reports of different provincial societies, the announcement that "Mr. De Monstraytor of the Camera Plate Company" had kindly given an interesting address on the conversion of sensitive films into gold and silver, &c. It is all very well, if it pays, to send travelling demonstrators about the country, and undouhtedly, in places cut off, so to say, from the metropolis and civilisation, they fill a valuable and useful position; but there is no need to take up valuable space in the weekly journals to chronicle these important events.

But the difficulty is what to do in the matter. It is a question, I fancy, that hinges more on the common sense of secretaries than anything else, for it is upon them, I assume, that the editor is dependent for his reports of meetings in the great majority of cases, and it is too much to expect that already overburdened individual to spend his time in cutting down and rewriting the reports of the some hundreds of societies' meetings that take place in the course of the year; which is "why I remark" that I think the Convention would provide a good opportunity for ventilating this matter generally.

But there are some directions in which editorial action might be taken and editorial severity, I think, exercised without injustice. Some few months back I remember a discussion taking place over some trivial matter in which a dissatisfied member impugned the correctness of a secretarial report. Of course, in any matter of vital importance, a correction of this kind may, and in all justice should, be made; but, when the thing resolves itself, as it did in this case, into a bit of trade jealousy, the Editor can scarcely be charged with undue interference with the liberty of the subject if he promptly "sits upon" the whole business. More recently we had the spectacle of the purification in public of the soiled linen of another provincial society, in which apparently two factions existed, and, though the internal arrangements of that society may be of the highest interest to its own members, their little quarrels don't greatly interest the outside world.

Precisely the same may be said with regard to the still more recent Cardiff Society discussion; it is scarcely of paramount importance to anybody whether one member "runs" a barber's shop or another plays the flute in a local band, but it is a sorry spectacle to see such personalities introduced into a discussion of any sort, and it scarcely reflects any credit upon the society to which the said members belong, and certainly does not affect the question upon which the discussion started. It seems to me that, in a place like Cardiff, the authorities of the Exhibition did the wisest thing they possibly could in offering the management of the photographic department to the local photographic society, who would certainly seem to be the most likely body to understand the business. As the Society does not profess to be a strictly amateur one, I fail to see where the question of amateur *versus* professional comes in; and, indeed, if it were an amateur Society, it seems to me that, if in their collective capacity they undertake the risk of management of the photographic part of this Exhibition, it would be a pity and a shame if they did not make some profit out of it. So far as I can see, it is really not a question of individual amateurs making a profit, but simply of the Society collectively undertaking a task in the interest of photography generally, and endeavouring to do it without pecuniary loss. Could any one reasonably object to the Royal Photographic Society making their Exhibition a pecuniary success? Yet, I believe, there are one or two *bonâ-fide* amateurs belonging to that Society who do not feel to lose status as such in consequence of the Exhibition.

Some other day I may indulge in a growl on the subject of the "rot" that is talked on the subject of amateurs and professionals—for such it really amounts to; and the introduction of the question in this Cardiff business is a good example. It is generally a certain class of professional who is only too glad to make the "amateur" the excuse for any and everything.

DOGBERRY.

PHOTOGRAPHIC WORKERS AT WORK.

VIII.—MESSRS. MARION & CO. AT SOUTHGATE.

THE works at Southgate, at which the papers, plates, and other products of Messrs. Marion have their origin, are situated on the northern edge of that pretty old-fashioned village, as yet unspoilt by the hands of the jerry builder, and are about a mile and a half from Palmer's Green Station, on the Great Northern Railway Company's Enfield branch. On the occasion of our visit we were unable to be conducted by Mr. Alexander Cowan, who, as works manager, has identified himself with the large factory, every room in which bears evidence of his ingenuity and invention, as he was confined to his room by an accident which has resulted in a broken leg, but enjoyed an efficient substitute in his son, Mr. Ashley Cowan.

The factory consists in a great measure of two large buildings, similar in external appearance and placed at right angles to one another, but entirely separate and each complete in itself, with a view to avoid any stoppage which a fire might otherwise occasion. In addition to these two buildings, there is an annexe of considerable size to one of them and a number of smaller structures. Entering the annexe just referred to, we find it contains, in addition to an office, a dark room for experimental work, packing rooms, and one devoted to speed measurement, to which we shall refer later on.

In the first of the main buildings we notice a 3½ horse-power Otto gas engine, which supplies the motive power for that factory, and pass it by to enter the emulsion-making room. Here are to be seen a number of stoneware "coppers," set in pairs in square masses of brickwork. Each copper is surrounded by a metal vessel of similar shape, through which a stream of water can be made to pass, while underneath is a powerful gas burner. The coppers are provided with light-tight lids, through which passes a vertical spindle, carrying stirring arms on its lower end and connected up above to shafting to rotate it. By means of the light-tight lid, the emulsion as soon as it is mixed can be cooked and stirred the while, the room being in full daylight; in fact, this was the case on the occasion of our visit, two of the coppers being then in operation. The lid of each copper is provided with a small hole closed with a plug through which a thermometer can be introduced if desired, the temperature of the emulsion being controlled by the cold water which can be caused to circulate in the outer vessel by turning a tap, a little opening in the outflow pipe being left so that the temperature of the water can be ascertained as it leaves the vessel. Light is obtained by means of lanterns provided with yellow fabric windows, and containing gas jets, while sliding doors to the window frames of the room allow it to be flooded with daylight when it need not be otherwise.

In another room is to be seen the glass-cleaning machinery, through which the glass plates are passed before they go to the coating room. Each plate is laid down upon rollers, which carry it between scrubbing

brushes moving backwards and forwards over both faces of the glass. The plates pass from the brushes up a long trough, during their passage up which they are rinsed by a series of streams of water from pipes which cross the trough every four or five inches. At one end of the glass-cleaning machine stands a girl who feeds the glass plates into it, while they are in like manner taken off at the other end, stood up in racks, and carried to a hot-air chamber which rapidly dries them. They are then stacked up in trays, and taken to the coating room.

Before describing the operation of coating, there are one or two rooms to which we must give attention, as they are those in which the emulsion, after it leaves the "coppers" in which it has been cooked, is washed and filtered. The first of these is devoted to the melting of the emulsion, and for this purpose contains two huge earthenware vats, each capable of containing 120 gallons. These vats, like the smaller ones in the emulsion-making room, are mounted in water baths for melting up the finished emulsion. Leading out of this is the filtering room and emulsion store. The word emulsion is derived from the Latin, and means literally a milk-like substance; and the true force of this derivation was brought home to us as we entered the room in question. Nothing more like a model dairy could well be conceived. Clean, cool, and airy, the floor covered with a lot of light-tight earthenware jars over each of which was a white cloth, the resemblance was striking.

The filtration is effected by means of a large globular earthenware vessel open at both top and bottom. The filtering material, leather or nainsook, being tied over the bottom, the emulsion is poured in above and allowed to run through by its own weight, a little force only being needed at the finish. The filtering vessel is mounted on rails projecting from the wall, so that a number of jars are arranged in a row, and the vessel is merely wheeled along from one to the next as each jar gets filled up. When the jars are full they are covered over with their lids, and a cloth moistened with dilute carbolic acid laid over each to guard against the slightest chance of putrefaction.

Leading out of the room just mentioned is one devoted entirely to the washing of the emulsion. In this the jelly-like mass cut up into thin shreds is placed in revolving cylinders through which a stream of water is kept running. As this room is kept absolutely dark, our knowledge of the process is derived from Mr. Cowan's description, which was corroborated as far as it went by the rolling sound of the cylinders which then contained emulsion.

Having in this way seen both the emulsion and the glass through the various stages of preparation, we went into the coating rooms to see them brought together. These rooms are, of course, lighted only by the feeblest yellow light, and it was some little time before our eyes accustomed themselves to the darkness, and were able to note anything likely to interest the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY. Entrance to the rooms is obtained, not through doors, which would be awkward to pass when laden with a tray of glass plates for the machine, but by means of a winding passage, which effectually cut off all light before the room itself was reached. There are two of these coating rooms and another in process of formation, but a description of one will serve. The passage opens up into one end of a long narrow room, all down one side of which is the coating machine itself. At the end nearest the machine is an *employé*, whose duty it is to keep it supplied with glass plates. These are carried by rollers upon which they are laid, first under a dusting brush, which ensures their top surface being perfectly clean, and then under the opening of a V-shaped trough, which delivers on to the plate a coating of emulsion. The thickness of this coating depends upon the rate at which the emulsion is fed into the trough, the source of supply being a large glass aspirator or bottle with a stopcock at the bottom, from which the emulsion runs in a thin stream into the trough. The plates, touching one another in a long procession, pass under the trough and then onward down a long narrow box-like structure ending in a roller. This roller, the circumference of which travels a little faster than the stream of plates, takes each plate up and passes it on into another long box, the bottom of which is formed of slate slabs. Down these slabs endless cords are continually travelling, and the plates, separated from one another by reason of the increased rate at which the roller and cords travel, glide on down the trough. As they do so, a little jet of water underneath them ensures that their under side is completely wet, in fact they glide on a film of cold water, in consequence of which the emulsion is set by the time the plates reach the far end of the box, where they are at once placed in racks and sent up into the drying room overhead. The coating machine is thus seen to be to all intents and purposes a long, narrow, shallow box, down which the plates are carried, and in so doing are dusted, coated, separated, and then, by means of cold water, set. The top of the box is covered with sheets of glass which protect the plates from dust, while at the same time allow the operations to be seen. One of such machines is capable of coating six or eight gross of whole-plates per hour, the actual number depending to a certain extent on the time of year, since the plates can only be passed through at such a rate as allows of their setting, and this takes place, obviously, quicker in winter than in the warmer months.

So far we have been entirely on the ground floor, the upper floor being devoted to the drying of the plates. This is done in the racks in which they leave the coating machine, which are sent up by a lift and passed, by means of rails, through the drying room, each rack pushing on those in front of it. There is no need to visit the drying room to ascertain the temperature, as a box in one of the rooms down below contains pulleys and cords, by means of which a maximum and minimum registering thermometer from each of the two drying rooms could be brought down for inspection at once, the box containing a book in which the temperature of the drying rooms is regularly entered up.

Messrs. Marion, as is well known, do not confine themselves to the manufacture of plates alone, but make also celluloid films as well as gelatino-chloride and other papers. The process of film coating is almost identical with that of the glass plates. The celluloid in strips not more than a yard long and a little wider than the size of the finished film is laid down upon glass plates coated with a composition which holds the film firmly and quite flat, but allows it to be separated easily by pulling. These glass strips carrying the film in this way are passed through the coating and drying operations, the film is then pulled off its glass support, cut to size and packed, while the glass goes back to have a fresh piece of celluloid laid down upon it for coating.

We now turn our attention to the other of the main buildings. This also is provided with its gas engine, of the same power as the other, but of a later and more compact pattern. This building also contains a number of lathes and other tools required in fitting up and maintaining the factory, and at the time of our visit was being provided with another coating machine and drying room for plate-manufacture.

On the upper floor we found the paper-coating machinery. A lift brings up a roll of paper and deposits it close to the machine, it is fitted in and fed round a series of rollers, coated with emulsion and automatically hung in long festoons up and down the room, provision being made for drying a mile of paper at a time. Paper-coating machinery is very much alike, and the general arrangements we have only recently described. At Southgate, however, there are one or two modifications which interested us. The paper is not passed round a roller through a trough of emulsion, but the latter is fed up against the surface of the paper in a smooth stream. As it travels vertically upwards, the paper picks up as much of the emulsion as it will carry, and the surplus flows back into the receptacle from which it is pumped up again for use. The coating machine possesses also a novel and ingenious arrangement by means of which, when the coating is stopped, the paper is cut off clean, the bottom part held so as not to necessitate threading it through the rollers when it is required again for use, while the loose-coated end has a dummy or apron of fabric attached to it, to carry it round the rollers so that the loose end is not wasted.

In this part of the factory is also a winding-up machine for the paper when coated and dry, guillotines for cutting it, while one of the large ventilators in the roof is fitted up with windows and a spiral staircase, and gives a beautiful view over Enfield and Epping Forest.

There is much all over the factory which is worthy of note, but our space here is limited, and we must hurry back to the laboratory whence we started, to see the various testing operations to which we have only hitherto alluded, and which are here very complete and systematic. The emulsion as it goes through the various stages is tested repeatedly, and until these tests have been performed none of it is coated. By this means it is not only easy to localise at once any carelessness or error, and so detect the cause of any defect, but much useless coating and subsequent cleaning off is avoided, and a consequent economy effected. These tests are invariably performed with pyro and ammonia and with pyro and soda without bromide, the developer being one which all the plates are required to stand. Spots, uneven coating, and similar defects are looked for by exposing a large plate to light all over and then developing to get a deposit which should be perfectly even. In this way the emulsion is watched through its various stages until the finished plates are ready. They now undergo a double test, the first being one on the lines indicated by Messrs. Hurter & Driffield. Strips of the plates to be measured together with a standard plate are exposed in the step by step dark slide devised by Mr. Cowan to the light of a standard candle. Overhead swings a seconds pendulum, and the exposure is performed by pulling out a row

of pegs one at a time at suitable intervals. When the strips so obtained are developed and dry, they are measured in a Bunsen photometer in the manner often described. One or two departures from the usual practice are to be noted. The photometer box itself is three feet long, the Schmidt & Hensch arrangement, which is extraordinarily sensitive, being substituted for the usual grease spot.

This test is always supplemented by another. A miniature studio in one corner of the dark room contains a patient and uncomplaining sitter in the form of a wax doll. A camera is fixed in one end of the studio in which is slipped the plate to be tested. One side of this studio is formed of a pane of ground glass, and outside this is burnt a piece of magnesium wire, the length of which is determined by the previously measured speed. In this way it will be seen that a practical test is given as well as one which some people might regard as rather theoretical. One most important matter in testing is not overlooked. It is insufficient to take one plate out of a batch, measure it, and from that say the speed of this batch is so-and-so. In the same batch the plates first coated may differ considerably in speed from those last coated, and it is only by taking plates here and there right through the coating that a fair average of their speed can be obtained, and this is a precaution which is not neglected by Messrs. Marion.

In this way, then, we passed through the works and found ourselves once more in the office, where we are met by Mr. F. Bishop, one of the partners in the firm. In concluding this notice we can only express our thanks to that gentleman and to Mr. Ashley Cowan once more, for the readiness with which they showed us the many interesting and clever arrangements which the works contain; many of these we have been forced to pass over without mention, but all are devised to ensure that high standard of excellence and uniformity which their products possess.

OBSERVATIONS ON PICTURE-MAKING.

[North Middlesex Photographic Society.]

When one is fortunate enough to be the friend of a President of a Society and in a weak moment succumbs to his flattering pressure to read a paper before his Society; and when, further, the President, out of his abundance, gives him a week to settle upon a title, it is then that the lecturer, in the desperation of the crisis, is tempted to welcome the first phrase that enters his head provided it has the ring and style of the usual lecture title, and he does so with the vaguest possible notions of what he is to talk about, and with little hope of being able to justify the title at all. So things happened in the case of your dutiful servant, who was stared in the face by the consciousness that he knew nothing about photography—a fact that will need no special demonstration to-night—and recognised that, if anything he could say to-night be worth the hearing, it could only be a statement of those few truths which hard work, failure, and repeated effort have formalised into mental furniture, so to speak. Certain of these two facts, he fell at once upon "Picture-making," there being nowhere else to fall. I am bold enough to say that, provided I stick to my last, there may be no great disadvantage in being only an admirer of photographs, and not a maker of them. You will think it not modest of me to say such a thing; but, then, I do not glory in membership of this Society, and so its great virtue has not possessed me. Some months back, the Society heaped hospitality upon me at an evening meal in Holborn, the sweet flavour of which, like Macbeth's amen, still sticks in my throat. On that occasion I learned how fine a thing it was to be a photographer, and be possessed of the great virtue which on that night enveloped every speaker and was known by the name of N. M. Modesty. My modesty, if I have any at all, is not, I fear, of the N. M. order; therefore, am I so bold as to say that, for our purposes this evening, there is no disadvantage in my being quite ignorant of the mysteries of the photographic art?

There are numberless ways in which the inborn talent of every photographer may find demonstration; but, primarily, they divide themselves into three—the scientific, the commercial, and the artistic. Perhaps the scientific progress and uses of the camera in late years give the most cause for wonder and appreciation. The realm of science is yet a new field, and it is possible that the future may show that photography will have done more than any other agent in unlocking the countless portals of Nature's marvels and secrets, and giving those marvels and secrets forth to the world in a widespread way undreamed of in old days.

In the commercial field, photography goes by leaps and bounds even at this day, and it is no great draught upon the imagination to picture to ourselves that, by payment of some small fee, no larger than we now pay for the *Daily Graphic*, that latest achievement which the camera has made possible, some great development of kinematography for instance, may show to the world absolute reproductions all alive of battles, public ceremonies, or what not, as they occur day by day. In fact, there seems to be no limit to the possibilities of photography, scientifically or commercially. But, artistically, when we come to that phase of it, we find a thing so different as to be almost another pursuit entirely. For let us understand that the artistic aspects of photography, as I shall define them to-night, preclude all technical questions and considerations; these may have distinct bearings, but I am powerless to discuss them, and shall deal only with the finished results, the picture; for, although the science of photography may perhaps help the attainment of such artistic results as might be thought desirable, yet the demands of art must first be established, in order that science may be directed towards them. Then, when we confine ourselves to the demands of art alone, we begin to understand why artistic photography is such a different thing to that of other kinds. Thinking for a moment of science and commerce as we are now using the terms, it is borne in upon our minds that their highest successes are high-water marks, so to speak, caused by the pressure of curiosity and cupidity respectively. This is perhaps a reckless summing up; but, at best, it represents the case broadly. Now, art is a little thing ready-made in each man's breast in a more or less degree, mostly less.

The struggle for existence does not call it forth, the adulation of the mass only degrades it. It is simply passion and emotion; technique scarcely counts, apparatus goes for nothing, the pressure in this case comes from within, and that makes the difference. But all these conditions of art have existed unchanged for ages, and so we find that art existed ages ago as good as any to be seen to-day. Should we expect to find more of it in the future than has been in the past? And now for the culminating question, Does the camera promise us more? It would seem that the field of art is already overtrodden, and that the camera will scarcely find a patch of virgin soil. We are stopped by the high boundary wall of limitations in photography so soon as we think to walk as far afield as did Ruysdael, Constable, and Turner, for the very reason that art is not an exact science, that it finds its sustenance in the passions and emotions of men rather than in their intellectual activity or in their experiments and calculations. For this reason is it like an old sweet tale which has been told and retold in a thousand ways according to the fancy of the teller, but never by any chance altered or extended without ceasing to be what it is.

Zola very finely described Art as Nature seen through temperament. That being so, why do not the countless devotees of palette and brush, though they paint on and strive to be original and see something freshly, in the long run see more than did Ruysdael, Constable, or Turner, when they walked the fields? They look at the same old nature, although it be through their own temperaments, and men may follow with cameras and meet with marvellous success, as we know they do; but they will not achieve more. Nobody for a moment expects that they will. As a matter of fact, they can never achieve so much, and for this reason.

The indefinable charm and fascination of a fine picture arises, not so much from the natural scene which was its model, as from the something which makes its first appearance in the actual process of painting—something that emanates from the artist, and makes him render the natural scene just so, and not just so. It is the *temperament* we have spoken of. It *is not* the correctness of portrayal, which may be absolutely correct or otherwise. If it were that correctness, possibly the camera would have a good chance; but it is the temperament through which nature is seen, and what I may ask is the temperament of a camera? The finest artistic temperament is displayed willy-nilly by the artist, and he is only conscious of it by the struggle that goes on in his brain, and the absolute concentration of his energies, which in a physique not robust may cause a palpable fatigue. It is bred by love of Nature, and a constant observation of her face, through all its smiles and tears, its frowns and sweetness. Every observation and experience of the artistic mind is stored up, we don't know where; and the more that is amassed the more is the mind tempered. When a picture is painted, all this stored-up richness plays its part, the painter's mind is permeated by it, and the work duly affected. Unfortunately, in the case of minds less receptive, less subtle in action, or warped by commercial and other influences, the temperament is impaired, the stored-up experiences crystallise into cheap mannerisms and tricks which are used for the speedy production of work, the obvious and catch-penny effects and other degradations only too prevalent. From one pole to the other, however, there is a highly graduated scale of work. Some of the finest landscapes never had an actual counterpart in Nature at all, but have been entirely the output of these stored-up feelings, sensations and facts. How different is this state of things from that of the photographer, who

has to take what is put before him, and who, in addition, has to deal with the endless faults of the lens, which won't see things as they should be seen—to wit, the defects of focus, undue sharpness or indistinctness of definition, violent ranges of definition, unequal definition and lighting abnormal perspective, astigmatism (spheres seen as egg shapes, and other similar atrocities), distorted perpendiculars, halation, and so on and so on, not to mention the further vagaries of toning and printing.

Now, we all agree that artistic photography makes no effort to pose as painting, and I will not add a quack to the cackle already heard upon the subject of palette *versus* negative; but perhaps you will permit me to say that, as Art is Nature seen through temperament, and that as the temperament of the camera, if it have one at all, is a somewhat perverted one, it follows that what artistic feeling there is in a photograph must be largely due to the photographer himself, and that such a fact places both artist and photographer on an equal footing where they had much better shake each other's hands than kick each other's shins, and, for my part, see here no difference between them. There is nothing fresh to be discovered in the *face* of Nature, each commonly do their best to preserve her smiles less clumsily, and this is the end of all landscape art.

It will always be found that the uninitiated, although quite prompt at expressing a preference for one picture before another, can never give a reason for their so doing; *i.e.*, apart from mere points of subject, association, sentiment, or such non-technical considerations. A more highly analytic or introspective spectator may be able to do so, and will perhaps express a preference much more forcibly; he may say, "I don't like that corner," or "That tree seems awkward," or "That piece from the house to the shore is lovely," but beyond such generalisations he will be unable to go, and to find a cause for his likes and dislikes will be out of his power. The trained mind alone is able to make a diagnosis, which it does by the help of certain standards or canons already fixed in the mind by the course of training through which it has passed. It finds that the displeasing part of the picture violates one or more of these canons, and that part which gives delight does so because it coincides with preconceived ideas as to what is most beautiful in this or that direction. It is, therefore, obvious that the duty of every one who wishes to make fine pictures is to come to some knowledge of these canons and laws and how they should be applied. He will do this best by studying the finest works of art, and trying to find reasons for his preferences; he will do it still, but less well, by reading books on the subject; and least well of all by hearing lectures. In most books it will be found that these laws are tabulated in a *very* precise and methodical way; but, as a matter of fact, the principles which give rise to them can be found running through all branches and phases of art. For instance, *gradation* may be made as much a matter of form as of tone, and the same may be said of massing, contrast, balance, repetition, and all the others. But, as, however, they can only be talked of one at a time, maybe there is no help for it.

Perhaps the most important thing in a photograph is composition, which may be defined as the disposition of the elements of a picture to the best advantage in relation to each other and to the whole. There is composition of line and composition of mass, but in landscape art the difference between the two is not very marked, although in ornament, for instance, there is a very strongly marked difference. Not much is to be gained at this moment in carefully dividing the subject into headings and sub-headings; but, roughly, it may be said that the art of composition embraces several principles, amongst which I may mention flow of line, massing, balance, repetition, even distribution and contrast. Many of these it is possible to have in one and the same picture. The principle of even distribution is usually only applied to ornamental art. An ordinary chess-board or a diaper pattern is sufficient instance of it, from which it will be seen that the method has no great place in landscape art. Nevertheless, I will show you a view which is strongly dominated by this principle, and you will see that its power is to give quietness, modesty, and tenderness to a view. This is a scene of Redlands Woods, taken by my good friend, Mr. F. H. Evans, who has been kind enough to lend a score of slides for our purpose to-night. Here it will be seen that the leaves on the trees and on the ground are so-equal in scale and tone, owing to the diffused lighting, that only the larger boughs and the ivy on the trunks *tell* at all in any strength.

Of course these strong portions and the delightful detail are the saving of the picture, and go to make its charm. A modern black-and-white artist, working in wash, and therefore shirking all the small drawing, as they do nowadays, would be hopelessly tame and weak with such a treatment. This slide is parenthetically shown, however, as an exception to the rule that even distribution is not often found in landscape art. I should prefer to start with the principle of *unity*, or singleness of subject, as we may call it.

A picture should have something to say; but it should not say too many things. It is usual with beginners in art to stumble upon the side of putting too many interests into their work. When an idea, a motive, a theme—call it what you will—has been decided upon for the subject of a picture, we shall not do wrong in giving it every chance and every square inch of room that it demands for its support. The spectator will not trouble to hear a very long tale, and, if we give him a dozen incidents all of equal importance, he will be impressed by none. His attention refuses to divide itself up over, it may be, a house, a tree, a mountain, a stream, a horse, a cart, children playing, clouds towering, birds flying, and so on, and so on, each of which clamours as loudly as another. Something should be allowed a first place. Supposing it to be the house, then all the other items can be included, if necessary, but in such a way that the spectator need not notice them unless he likes; but he must be made to see the house. Here is a very rough print of John Sell Cotman's famous water-colour, *The Draining Mill, Lincolnshire*.

The impressiveness of this wonderfully dignified work is due to the fact that it is a picture of the mill pure and simple, all else there is in the picture only working towards the one effect, which the mill initiates. The bank of the pool is very simply massed together with the mill, and thus not only supports it, but becomes a part of it. The pool, while giving in a romantic way an echo of the sky, at the same time repeats the story of the mill in its reflections. As for distracting elements, there are none. The next illustration is another mill, this time by David Cox. The same simplicity is here. There is no absorbing interest anywhere but in the windmill. The sky is so quiet as to be almost flat, the foreground, mid-distance, and distance are also broad and *flat*, which is to say even in tone; and nothing in them is strongly made out. I would also draw your attention to the horizontal composition of these parts, by which the vertical lines of the mill gain a dignity and importance, two qualities which would be the sum of an ordinary person's after-impression, supposing him not to have seen the work before. Yet another mill, this time by a photographer, and, moreover, by your esteemed member, Mr. Samuel Wall. The simplicity, dignity, and charm of this very lovely composition are due to exactly the same principles as are those of the two prints you have just seen. Yet it must not be thought that windmills alone supply these necessary qualities. I was tempted to include this slide because it composes so well—the foreground, the boats, the distance, and sky, all being beautifully in harmony; and I also wish you to appreciate how much of Cotman and Cox there is in your fellow-worker, Mr. Wall. Nevertheless, windmills usually make dignified subjects, by reason of their exposed position.

Now, we have another picture by the same worker, taken one day when he was antagonistic to Cotman and Cox. It has numberless fine points, which we will not dwell upon now, for I show it on account of its one unsatisfactory point, the divided interest of its composition. As it stands there is enough material for two pictures, and the eye jumps from the house to the bridge, and back again, and finds no place to settle happily. It will be found that all the styles of composition and all laws of picture-making can be made to serve this important end—*unity of interest*. Given a motive or theme, and we can make lines to lead the eye to it, masses to support it, reflections to echo it, gradation to lead up to it, contrasts to enforce it, and so on in endless resource. In a moment we shall have a slide (which you have seen before), made by another good friend of mine, your worthy President. But first I ought to say that these slides are lent to-night simply to help the coherence of my remarks, the owners do not regard all of them as triumphs in photography or slide-making, and I do not court your criticism in regard to them. What remarks I may make apply to matters entirely outside photographic technicalities, and outside matters of taste also, upon which there can be no disputation.

In looking at photographs I have come to the conclusion that mere luck can make or mar. There is no persuading or liberty taken as there is in sketching. If there is luck and you know the moment to seize it, a really fine thing may be ready to hand; but without such luck you are courting doubtful success, if not failure.

Now look at this picture. First of all, there is unity of interest, about which I have been preaching, fairly kept, the arch is evidently the chief motive, it is larger than anything else; it has the important place in the composition and is strongest in colour. Very well, the eye goes there first, and takes it all in; but here is the misfortune, it is so quickly satisfied that it leaves the arch at once and wanders down the stones of the brook, *which it likes much better*, for in them there is more variety and richness and much more interest. But the deep black of the arch call the eye back again so lustily that back it goes conscience-striken, this time it may discover the branches and twigs across the portion in the shadow,

and may stop a little longer, All this can mean nothing but the arch is "doing the *heavy*," if you will allow me so much slang, under false pretences; and really there is nothing very absorbing about it in spite of the prominence it takes. Probably the artist himself felt this, for I will show you another view where the interest is transferred to the boulders. But first let me point out another piece of ill luck, which is, that the two trees to the right and the two nearer edges of the arch are all nearly equidistant; that they make right angles with the top of the wall, which is itself a decided horizontal line. These points refer to principles which will be reverted to later.

Now let us look at the next slide. Here is the same subject making a very beautiful picture. The water rushing over the boulders becomes the chief object of interest. They have the highest light and the deepest shades. The arch being now smaller and further away has become secondary, but is, nevertheless, more interesting than it was before, and yet it does not detract from the water and boulders, for its softened tones echo those of the foreground while they give a richer spot to the mid-distance. The equidistance of the vertical elements is not so marked, the horizontal wall has gained a dip somehow in the centre, while its edge has become softer in quality; and lastly, the extreme distance has a finer character. All these improvements are the outcome of a better selection; and selection is the photographer's only substitute for the painter's licence of omitting, inventing, and altering.

F. Colin Tilney.

(To be continued.)

FRIESE GREENE'S IMPROVEMENTS IN RAPID PRINTING BY PHOTOGRAPHY.

The following is a brief description of Mr. Friese Greene's improvements in the production of prints by photography, and in apparatus for the purpose.—

"I print successively by means of photography a number of impressions from the same photographic or other negative, or from the same series of negatives, upon a continuous band of sensitised paper or other sensitised material, as this is caused to travel continuously in contact with a translucent cylinder which bears or carries the negative or negatives, the said cylinder being lighted internally, preferably by one or more incandescing electric lamps.

"In carrying out the invention, when the negative or negatives employed are photographic negatives, I use negatives which have been taken upon a flexible translucent material such as a thin sheet of celluloid, and I place this sheet upon a supporting cylinder of glass in such manner that the sheet bearing the negative or series of negatives surrounds the cylinder. Within this cylinder I place one or more lamps. Over or under the cylinder, and in contact with the celluloid sheet thereon, I carry a band of sensitised material from a roll or otherwise, this band being so guided that there is always a part, say, several inches, of its length in contact with the celluloid sheet and this part of the band being maintained taut. Rotary motion is given to the cylinder and forward motion at the same surface speed to the band with the result that every section of the band equal to the circumference of the cylinder has printed upon it by means of the light a positive impression from the negative or negatives on the cylinder, the same picture or pictures being produced upon every successive section of the band. On leaving the cylinder the band is carried to and through fixing and developing baths; or, if it be required to print upon both sides of the band, it goes from the first cylinder to a second and similar cylinder, where it is printed in like manner upon its second side; it then passes on to the fixing and developing baths.

"When the negatives employed are not photographic negatives, they may, for example, be transparencies or sheets having the parts that do not constitute the design in black, red, or other non-actinic colour, and the other parts, that is to say, the design transparent, or *vice versâ*.

"It is not essential to employ the glass cylinder described if the sheet that bears the negative or negatives is strong enough to be self-supporting."

NOTES FROM THE WEST OF SCOTLAND.

Some time ago, we were enabled to inform our readers that a movement was on foot in Glasgow and the surrounding district with the view of having another International Photographic Exhibition on similar lines to the one held in Glasgow during the autumn of 1891, and which proved such a big success for its promoters.

No doubt the Exhibition would have been held this autumn, but it was found that several circumstances stood in the way of arranging for such, the chief of these being the impossibility of obtaining the Fine Art Institute in Sauchiehall-street, which was secured a long time ago for the autumn months for the Burns Exhibition.

We are pleased, however, to be able to state that all obstacles in the way of securing these fine rooms for the autumn of 1897 have been overcome, and that Mr. Goodwin, on behalf of the Council of the Glasgow and West of Scotland Association, has signed a contract for the entire Institute's accommodation during the months of September and October of next year.

This scheme will be carried out with much vigour, and amateurs and professionals, both north and south of the Tweed, should keep the autumn of 1897 in view, considering the importance of this event.

Fifteen thousand persons visited the Corporation Camphill Exhibition during the first ten days of its opening.

THE W. H. HARRISON FUND APPEAL.

	£	s.	d.
Acknowledged last week	93	5	0
R. T. Mallet, Esq., M.R.I.	1	1	0
J. Tennant, Esq., M.R.I.		10	0
	£94	16	0

Further donations will be thankfully acknowledged by

Fredk. H. Varley, 82, *Newington Green-road, London, N.*

The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* Journal *useful and instructive.*

Image in Chromate of Silver.—Chromatic writes: "Is there any method by which I can convert an ordinary silver-image negative or positive (untoned) into chromate of silver? I want to utilise the colour of the silver salt for transparencies and positives of a particular class of subjects."

Storing Negatives (To "Cimex").—Put a little varnish (if tacky, so much the better) on the spare part of the negative. When nearly dry, press on the label. But why not write on the face what you require with a lead pencil? This will show sufficiently, and cannot be rubbed off. Or you can scratch it neatly with a strong pin, showing clear lettering.—W. G.

Cement for Glass and Paper.—In reply to the query of "Cimex" in The Inquirer column of last week's British Journal of Photography, I may say that I find it a good plan to make negative labels of albumenised (unsensitised, of course) paper, sticking them on to the film side of the negatives by simply wetting the albumen. They should be put on before varnishing, the latter operation giving them greater durability.—Drinkwater Butt.

Wet Plates and Alkaline Development.—J. B. writes: "In connexion with the query on this subject last week, I have for a long time employed ferrous oxalate in the intensification of wet plates, and I find it decidedly superior to pyro or any other form of alkaline development. There is less tendency to the fault complained of by your correspondent, viz., stain from insufficient washing, it gives greater density, and a colour that more nearly resembles ordinary silver development. In order to get the full effect, it is necessary to continue the application for some time, as the image formed by the first development seems to hinder the penetration of the intensifier. It should also be borne in mind that the density increases in drying more than is the case with pyro and silver."

Wet Plates and Alkaline Development.—In reply to "A Beginner in Wet-plate Work," may I add to what was said last week that his failure is, without doubt, due to insufficient washing. There are several methods besides the special use of a solution of salt by which the last traces of silver can be converted, but perhaps the simplest is to apply the pyro (or other reducer) and the bromide to the plates before adding the alkali, in which case any trace of free silver is converted into bromide. It is the silver and alkali that react upon one another, not the pyro and silver, as *plain* pyro can be applied to a film containing decided traces of silver. The addition of a few grains of nitrate of ammonia to the developer will prevent the mutual reaction referred to, and at the same time act as a restrainer of development.—Syntax.

CEMENT FOR LABELS (To "Cimex").—If your correspondent will try the simple plan of adding a little loaf sugar or a few drops of glycerine to the adhesive, I think he will find his difficulties disappear. The cause of the labels becoming detached is that the mountant, whether paste, gum, or gelatine, becomes too dry and brittle, and then loses its attachment for the glass, though good paste does not usually exhibit this weakness. The sugar or glycerine supplies sufficient hygroscopic matter to prevent the state of excessive dryness, and preserves the adhesion of the labels. If "Cimex" lives anywhere near a bookbinder or a shoemaker, either will supply him with a paste that answers admirably for such work as he speaks of, but I should not advise him to mount photographs with it.—W. L. BROWN.

CEMENT FOR GLASS AND LABELS (To "Cimex").—PHARMACIST writes: "If 'Cimex' wants a good and reliable cement for labels, I will give him a recipe I have used for many years, and which I have occasionally employed for mounting photographs, my only reason for not so employing it regularly being that it necessitated being used warm; and, besides, the prints are very difficult to remove if not placed in proper position on the mount at first attempt. Let him procure at any chemist's an ounce or two of gelatine lozenges—not the glycerine jujubes, though I dare say these would answer, but the old-fashioned round, flat lozenges. Cover these with cold water, and allow to soak for some hours; then dissolve by heat and thin to a convenient consistency. It requires liquefying by heat before use, and will keep indefinitely, owing to the sugar and flavouring the lozenges contain."

CLEANING OFF OLD NEGATIVES.—At the risk of overdoing the advice to W. Howard *re* cleaning old negatives, a simpler and cheaper plan than any yet published is as follows (this may be of use to others as well):—Put some washing soda into a saucepan of water; make it boil. While heating, take a pan and place a negative in it film uppermost; on it at each end place a match, if you are a smoker, or any other small object. Upon these put another glass, film downwards, leaving a space between. The third can go flat on the second, matches and plates as before, until the pan is full. Then pour in your solution, hot and strong. By the time it is cool enough to take out the plates, the film will be detached, or may be with the edge of one of plates. Sometimes a very obstinate case requires a second dose. Rinse in clean tepid water. If wanted chemically clean, follow with a washing of acidulated water.—W. G.

X RAY WORK.—MONA. This correspondent writes a long private letter to Mr. Watmough Webster, asking for advice *re* Röntgen ray work, although Mr. Webster in his paper on this subject specially asks strangers to apply through the JOURNAL if desiring information regarding this or any of his contributions. Briefly, "Mona's" focus vacuum tube has gone wrong. It had a brass cap cemented on at one end, and thus had gradually come loose, and the tube has lost its power. "Mona" wishes to know if this is a customary way to construct these tubes, and wishes to have Mr. Hicks' address so as to send the tube to him for repair, the maker ignoring all "Mona's" letters.—Reply to "Mona:" You do not say whether the brass cap is essential to closing the tube or not. It is not the usual way of making these tubes to seal an end with a metal cap cemented to the glass tube; usually the tube is complete of itself, the vacuum being made by means of the small projecting glass tube that is seen as part of these tubes. It has been recommended to increase the potency of the tube by putting a metal—tinfoil—cap outside the anode. Perhaps "Mona's" tube had the brass cap padded for that purpose. If the cap was needed for closing the tube, the latter would, of course, be destroyed upon the separation. The most probable cause of the failing of the tube is that "Mona" has "sparked" it—a very common occurrence with those not used to manipulating vacuum tubes. If, through one connecting wire springing or otherwise coming in close proximity to the tube while the other wire is connected with an electrode of the tube, a spark passes from wire to tube, the latter is pierced with an invisible microscopic aperture, and the atmospheric air enters. "Mona" will find that a three-inch spark coil is as low as possible for doing *quick* work with. Mr. J. J. Hicks' address is 8, 9, and 10, Hatton-garden, E.C. But "Mona" will find that no one is likely to repair a spoiled tube.—G. WATMOUGH WEBSTER. P.S. "Mona" may be able to improve the value of his tube by means of the plan suggested by Mr. Porter, which in all probability the Editor may publish this week.—G. W. W.

Our Editorial Table.

CATALOGUE RECEIVED.

S. J. LEVI & Co., 71, Farringdon-road.

A VERY comprehensive catalogue of 112 pages, illustrating a large variety of photographic, stereoscopic, microscopic, optical, and electrical apparatus. The trade in particular will find the volume extremely useful on account of its completeness, scarcely an item of modern photographic requirements being denied mention.

VIEWS OF ST. BARTHOLOMEW THE GREAT, WEST SMITHFIELD.

By FREEMAN DOVASTON. With Notes by E. A. WEBB.
London: F. Dovaston, 5, George-street, Euston-road.

ON a previous occasion we wrote in commendatory terms of a collection of half-tone views of *St. Paul's Cathedral*, from Mr. Freeman Dovaston's negatives, and the same indefatigable worker has in the present *brochure* got together a number of similar reproductions of a series of negatives of that interesting church, *St. Bartholomew the Great, West Smithfield*. Keeping in view the difficulty of photographing the far-from-well-lighted interiors, the views of the choir, the baptistry, the tombs, the West door, the ambulatories, and other parts of the church are very well done, while Mr. Webb's notes are terse and useful, and the *brochure* (which sells at 1*s.* net) may, as a whole, be commended to all lovers of Old London.

THE "P. S." PLATE (ACTINOGRAPH No. 80).

Marion & Co., Soho-square, W.

IN sending us for trial some of their new plates—the "P. S."—Messrs. Marion draw our attention to their announcement that, following the recommendation of the Speed Committee appointed by the Royal Photographic Society, the speed of these plates is determined by the Hurter & Driffield method by using the same developer as advocated for use in actual practice, viz., pyro and soda. We employed pyro soda in the development of the plates we exposed, our experience of which was entirely satisfactory. The emulsion is exquisitely sensitive, clean, and fine in the green, and yields negatives of a peculiarly harmonious and well-gradationed character. We could not wish to work with a better or more carefully prepared plate than the "P. S."

THE ELEMENTS OF STEREOSCOPIC PHOTOGRAPHY.

By C. F. SEYMOUR ROTHWELL, F.C.S. Bradford: Percy Lund & Co.

MR. ROTHWELL knows his subject well, and writes of it very clearly; his book, in fact, is well calculated to be of assistance to the beginner in this fascinating branch of work. Alluding to the size of plate to be used, he strongly condemns a favourite size of our own, $6\frac{1}{2} \times 4\frac{1}{4}$, on the ground that plates of that size are difficult to obtain. "It has," he says, "its chief advocates in people who are interested financially in the sale of appliances of this size." We have used the size for years for stereoscopic work, and have no financial interest in it, but we occasionally find it convenient to use two quarter-plates instead of one $6\frac{1}{2} \times 4\frac{1}{4}$ plate when the latter does not happen to be at hand. For the rest, we can thoroughly recommend the book, merely adding, however, that the author has overlooked mention of probably the simplest method of stereoscopic transparency making by contact, viz., where the negative is clamped in position over an aperture approximating to its own size, and the transparency plate in the two successive exposures is moved from side to side.

PRACTICAL RADIOGRAPHY.

By H. SNOWDEN WARD. London: Dawbarn & Ward, 15, Farringdon-avenue, E.C.

PREFACED by a brief outline of the electrical principles involved in radiography, we have in Mr. Snowden Ward's ably compiled little manual chapters on "How to Make an Accumulator," by Mr. A. E. Livermore, and "How to Make an Induction Coil," by Mr. E. A. Robins. The remainder of the book treats of the electrical and photographic branches of the main subject, and well realises its introductory claim of being of service to photographers insufficiently acquainted with electricity, electricians insufficiently acquainted with photography, and surgeons insufficiently acquainted with both. There are numerous illustrations, and the handbook is one of the most practical of the many volumes so far called into existence by Professor Röntgen's remarkable paper and experiments.

News and Notes.

We are sorry to learn that Mr. Alexander Johnston, F.R.P.S., photographer, of Wick, died at Edinburgh on June 21.

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, July 8. Members' Open Night.

Up-to-Date.—Physician of the new school, after turning X rays on patient: "Your case is a somewhat complicated one. There is a slight trouble with your left lung, and I observe enlargement of the liver, and fatty degeneration of the heart. Kindly hand me those two sovereigns in your right-hand trousers pocket, and I will prescribe for you."

In the year ending 1896, May 10, photographs of the sun were taken at Greenwich with the Dallmeyer photo-heliograph, mounted on the terrace roof of the south wing of the Physical Observatory, on 229 days, and of these 459 have been selected for preservation, besides fourteen photographs with double images of the sun for determination of zero of position angle.

Albert Medal.—The Albert Medal of the Society of Arts has been awarded, with the approval of H.R.H. the Prince of Wales, the President of the Society, to Professor David Edward Hughes, F.R.S., "in recognition of the services he has rendered to Arts, Manufactures, and Commerce by his numerous inventions in electricity and magnetism, especially the printing telegraph and the microphone."

A few weeks ago I alluded to the useful purpose photography had served in the coaching of the Yale crew in America. There seems no earthly reason why it should not serve a still more useful purpose on the turf. Not only at the finish of a race, but at the other end as well, it might be brought into requisition. An instantaneous photograph of the start of some races I have seen would make a particularly interesting study for the handicapper.—*The Weekly Sun.*

Failures.—The following passage, from a speech by Lord Kelvin, is worth recording: "One word characterises the most strenuous of the efforts for the advancement of science that I have made perseveringly during fifty-five years, that word is *failure*. I know no more of electric and magnetic force, nor of the relation between ether, electricity, and ponderable matter, nor of chemical affinity, than I knew and tried to teach my students of natural philosophy fifty years ago in my first session as professor. Something of sadness must come of failure; but, in the pursuit of science, inborn necessity to make the effort brings with it much of the *certaminis gaudia*, and saves the naturalist from being wholly miserable, perhaps even allows him to be fairly happy, in his daily work. And what splendid compensations for philosophical failures we have had in the admirable discoveries by observation and experiment on the properties of matter, and in the exquisitely beneficent applications of science to the use of mankind with which these fifty years have so abounded."

Society of Arts Medals.—The Council of the Society of Arts have awarded the Society's silver medals to the following readers of papers during the session 1895-6:—W. J. Dibdin, F.C.S., for his paper on "Standards of Light;" A. J. Hipkins, for his paper on "The Standard for Musical Pitch;" A. A. Campbell Swinton, for his paper on "Röntgen's Photography of the Invisible;" Dr. D. Morris, C.M.G., M.A., for his paper on "Bahamas Sisal Industry;" Edward W. Badger, for his paper on "Fruit and Vegetable Drying;" E. W. Moir, M.Inst.C.E., for his paper on "Tunnelling by Compressed Air;" Col. R. G. Woodthorpe, C.B., R.E., for his paper on "The Shan Hills, their Peoples and Products;" J. H. Glass, C.I.E., for his paper on "The Great Landslip at Gohna, in Gurhwal, and the measures adopted to Prevent Serious Loss of Life;" G. W. Christison, for his paper on "Tea Planting in Darjeeling;" Frank Cundall, for his paper on "Jamaica in the Past and Present;" G. Scott Elliot, for his paper on "The Commercial Prospects of English East Africa and British Central Africa;" Charles R. Valentine, for his paper on "The Colonies and the Supply of Dairy Produce and Products of Petite Culture;" Gleeson White, for his paper on "The Poster and its Artistic Possibilities;" William Burton, F.C.S., for his paper on "The Palette of the Potter;" George Simonds, for his paper on "Bronze Casting in Europe."

A Question of Colour.—At the present time, when so much is being done by way of experiment in colour printing and straining after the utmost effect obtainable with the three primary colours, it occurs to a studious mind that the extreme fineness of the subdivision of these three colours necessitates as much extreme care in their interpretation by the printing press. It only needs to run through one edition of such a piece of colour work to note the inequality. Where the yellow predominates ever so slightly, the effect in the result is crude; if the red predominates, then the picture looks too fiery, and, if the blue predominates, too cold or inclined to green or to purple, according to its relative value to the other two colours. It is to obviate this that the introduction of a suitable shade of light grey printed in conjunction with the three primaries has the effect of mixing with and binding together the three raw colours. Heliochrome inks, so called from their being slightly neutralised or toned down by the admixture of small proportions of their complementaries (grey) bring the three raw colours into harmony; yet does this only in relation to each individual colour. Now, by *printing on grey*, obtained by mixing the same three inks in proper proportion, the effect is still further to harmonise and bind together the three colours. This principle is well known in chromo colour printing. To make a key block and print in black or photo brown and let the red, yellow and blue take their chance, is to get the coloured-up photo look in the result. Instead of this, to get the utmost subdivision in three primaries, of which the blue is the most important, giving the vital drawing of the picture, and to print the key block a suitable grey, is to aid the blue in its effect as far as density, depth, and the drawing in the picture are concerned. —Joseph Scholefield in *The Practical Process Worker.*

During last year M. Flammarion made some interesting experiments as to the effect of lights of different colours upon vegetable growth (*Bull. Soc. Ast. France*, June). On July 4, eight identical sensitive plants, which had been sown at the same time, were selected for experiment. These were placed two by two in similarly constructed glass boxes, of which the sides were of different colours, one being red, one green, one blue, and another of ordinary clear glass. All were exposed to precisely the same meteorological conditions throughout. The rates of growth were as follows:—

	Red.	Green.	Blue.	White.
	m.	m.	m.	m.
September 6	0·220	0·090	0·027	0·045
,, 27	0·345	0·150	0·027	0·080
October 22	0·420	0·152	0·027	0·100

Thus, while the plants exposed to blue light made no progress whatever, those exposed to red increased their height fifteen times. The latter, moreover, acquired an extraordinary degree of sensitiveness. Similar results, but not so strongly marked, were obtained with geraniums and other plants. The fact that the plants exposed to white light grew less rapidly than those which were under red glass, although receiving the same amount of red radiations, seems to suggest that the presence of blue light in the former case not only did not accelerate the growth of the plants, but actually retarded it.

Royal Cornwall Polytechnic Exhibition.—The following are particulars of the classes and prizes for the photographic section:—In all cases state whether the work is professional or amateur, and name process of production. All work sent for competition must have been executed within eighteen months of the date of this Exhibition. *Carte-de-visite* portraits are excluded from exhibition, except when illustrating some special process or novelty. All enlargements for competition must be the work of the exhibitor. Information respecting the photographic department may be obtained from Mr. W. Brooks, Laurel Villa, Wray Park, Reigate (member of the General Committee). *Professional.*—Medals are offered by the Society for meritorious productions in the following subjects:—Outdoor photography: 1, Landscape, not less than 20 by 16 inches; 2, Landscape, 12 by 10 inches and under; 3, *Genre;* 4, Architectural (exterior); 5, Instantaneous, including Marine; 6, Animals; 7, Enlargements. Indoor photography: 1, Portraits, not less than 20 by 16 inches; 2, Portraits, 15 by 12 inches, and under; 3, Home Portraiture; 4, Still Life, Flowers, &c.; 5, Interiors, Agricultural or otherwise; 6, Photomicrographs; 7, Enlargements. *Amateur.*—1, Landscapes; 2, Architectural, exterior or interior; 3, Hand camera work—not less than twelve examples; 4, Instantaneous, including Marine; 5, Still Life; 6, Enlargements. *Photographic Apparatus.*—With a view to offer facilities to manufacturers to bring their specialities prominently before the public in the West of England, the Society purpose this year to apportion space for photographic apparatus generally, including the lantern and its appliances.

Photography and the Royal Family.—At the recent visit of the Prince and Princess of Wales and the other Princesses to Machynlleth, it may be of interest to know that the Princess of Wales was carrying her hand camera about in the Plas Machynlleth (the seat of Lady Londonderry), taking chance groups of the friends as they talked or played croquet on the lawn. That the interest and amusement caused to Royalty by photography and photographers is by no means small, the following amusing incident will show: There were to be two young trees planted in the grounds, one by the Prince of Wales and the other by the Princess. When the royal visitors had, with Lady Londonderry and a few friends, departed to witness the ceremony of planting, the Prince having taken the spade in his hand, a peculiar noise was heard by them. However, they took no notice; but, upon hearing the noise, "as of the lower jaw of a skeleton," repeated several times, the Prince, Princesses, and the nobility collected made for to discover the meaning of these uncanny sounds. Long and loud was the laughter by all when it was found that Mr. B. Pearce and Mr. Fred Coop were concealed in the adjoining bushes, and that it was the snap of their Thornton-Pickard shutters which had caused the investigation. The undaunted photographers snapped off the Royalty when laughing boisterously, and highly amusing were the excellently successful groups produced under such marked difficulties—seven p.m. The two above photographers on the same morning had the honour of photographing the Royal group at the Plas before their temporary departure to Aberystwith to open the University College of Wales, recently built there. Lord Herbert, son of Lady Londonderry, declared that the group referred to could not be better, and that it was a perfect likeness of all. Very gracious were the royal visitors to the photographers, as is further exemplified by the fact that, at the station on Saturday morning, previous to their departure, the Princess sat down in the carriage again at the request of the photographer, and allowed a picture to be taken.

Edison's New Electric Light.—A notable example of the stimulation of invention by new discoveries is found in the latest work of Edison which follows the discovery of Röntgen and the fluoroscope of his own invention. This latest invention is a fluorescing lamp in which is found the promise of the artificial light of the future. The lamp appears to have all the qualities requisite for perfect illumination. The light is mild, but effective; it is diffusive, like daylight. It gives off no perceptible heat, which latter quality goes to show that its economy has no parallel in other kinds of artificial illumination. One form of the lamp consists of a highly exhausted oblong glass bulb, having wires sealed in the ends, each wire being provided with a small plate inside the bulb, one of these plates being inclined, to cause a distribution of the rays over the side of the lamp. The inner surface of the lamp is covered with a granular mineral substance, which is fused on the glass, and is highly fluorescent. When the lamp is excited by connexion with an induction coil, the fluorescent material becomes luminous. Originally Edison used calcium tungstate for his fluorescing material, but, by trial, he found that the vacuum soon deteriorated, and, after a long series of experiments, has discovered a fluorescing material which does not affect the vacuum, while it has a higher efficiency than the calcium tungstate. Mr. Edison thinks that the fluorescing material converts all of the X rays into light. He has a theory as to the manner in which the light is produced. The crystals are

composed of light and heavy particles, and the impact of the waves produces a stress in the crystals which causes the emission of light. Mr. Edison describes these waves as sound waves, because they differ in their mode of vibration from ether waves. Their motion is infinitely more rapid than that of sound waves, with which we are familliar; they are comparable as regards velocity with electric or light waves. As to efficiency, the fluorescing lamp produces light at the rate of 0·3 of a watt per candle power. When this is compared with 3 watts per candle power for incandescent lamps, and ½ watt per candle power for arc lamps, it will be seen that there must be great economy in the fluorescing lamp.—*Scientific American.*

ARE RÖNTGEN RAYS POLARISED?—Mr. J. William Gifford writes to *Nature:* "Mr. L. Casella has made for me a Crookes' tube, having as the anode a platinum window sealed into the end of the tube opposite the cathode, which is the ordinary aluminium disc. Owing to the glass sealing, only a small portion of the platinum, about 3 mm. in diameter, is free to act. The light from all but this portion was screened off by thick glass discs and a brass disc, these having each an aperture in the centre. The result with the fluorescent screen was at first poor, because the vacuum was too low; but, as that got higher, it improved, and I was able to electrograph a part of the hand by the rays given off by this small platinum window in fifteen seconds, the plate being two and a half inches from the window. An ordinary focus tube takes thirty seconds to produce the same effect under similar conditions, but gives better definition. With the platinum window tube, though the bones are defined on the fluorescent screen, there seems to be too much white light, and the difference between bones and flesh is less marked. The tilted platinum of a focus tube apparently reflects most of the cathode rays, but transmits some. Compare the behaviour of the platinum in both tubes with the action of light on glass. With both glass and platinum, part of the rays are transmitted and part reflected, the proportion varying with the angle of incidence; but, with both, those rays which are perpendicular are apparently transmitted. If the glass be tilted at the proper angle, the reflected rays and a small part of the transmitted rays are polarised. Suppose the plate of glass in the position of the platinum window, and the source of light a luminous point within the tube; although most of the transmitted light would be radiated direct from the luminous point, part would be rays which had been polarised by reflection from the walls of the tube. The analogy would still hold good, for we know that, as far as X rays are concerned, glass behaves very similarly to platinum, for these rays are, under suitable conditions, given off by both. These considerations and the appearance of microscopic preparations containing bone undecalcified when examined by low powers and ordinary light under Nicol prisms, lead me to hazard the suggestion that a bare possibility exists of X rays being polarised cathode rays. Were this so, the two kinds of X rays described by several observers would be explained, and we should also understand why those who have tried to polarise these X rays should have failed, the rays being already polarised. If this view is correct, extinction of the X rays should be caused by reflection from a second platinum surface at the proper angle. Whether this would succeed at atmospheric pressure I know not; the experiment should be tried *in vacuo*, and a tube constructed specially for the purpose. The window tube has, at all events, proved that a quantity of cathode rays, with some X rays, may be transmitted through moderately thin platinum under these conditions."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
6.....	Bradford.....	*Development.* G. Swaine.
6.....	South London	*Cameras and their Varied Forms. Lenses, Stands, &c.* C. H. Oakden.
7.....	Brixton and Clapham	Ordinary Meeting.
7.....	Gospel Oak	*Photographic Chemicals.* H. Billingsley.
7.....	Hackney.....	*Exposure.* W. E. Debenham.
8.....	Photographic Club	Members' Open Night.
11.....	Borough Polytechnic.....	Excursion: Bostal Woods or Stratford-on-Avon.
11.....	Darwen	Excursion: Hoghton Tower and District. Leader, Jno. A. Hargreaves.
11.....	Gospel Oak	Excursion: Totteridge and Mill Hill.
11.....	South London	Excursion: Shepperton, for Walton-on-Thames. Leader, C. E. Fortune.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 25,—Mr. R. Beckett in the chair.

The HON. SECRETARY read the annual report of the Committee, together with the balance-sheet, from which it appeared that the Associatian was in a healthy financial condition, with a balance in hand of 39*l.* odd. During the year a heavy loss had been sustained in the death of Mr. Traill Taylor, one of the Trustees, the vacant post being filled by the appointment of Mr. A. Haddon, whose office of Curator is now held by Mr. F. B. Grundy. In consequence of removal from London, Mr. Atkins has resigned the Recordership, and, in recognition of his services, he was elected an honorary member. The Committee regret that Mr. Henderson's offer of five guineas, coupled with a similar amount from the Association, for the most valuable papers read during the session had not been responded to as expected, but Mr. Henderson has consented to the sum being held over for disposal on the same lines at a future date. The Committee also wished to impress upon the members the desirability of their co-operation with the officials in rendering the meetings as attractive and interesting as possible.

Mr. Henderson proposed that the report and balance-sheet be accepted. This was seconded by Mr. Freshwater and carried.

The election of officers and committee for the ensuing year then took place with the following result:—*Trustees:* Messrs. A. Haddon and J. B. B. Wellington.—*Committee:* Messrs. Bayston, R. Beckett, R. P. Drage, T. E. Freshwater, J. E. Hodd, J. S. Teape, E. J. Wall, and W. D. Welford.—*Curator:* Mr. F. B. Grundy.—*Librarian:* Mr. H. C. Rapson.—*Hon. Secretary and Treasurer:* Mr. P. Everitt.

Mr. Bayston showed a print of a "double" taken in an ordinary camera in a very simple manner by the insertion of a suitable piece of card midway between the lens and the plate, which protected one-half of the plate during the first exposure, after which it was shifted across, the subject re-posed, and the second exposure made. If the camera is not moved, hardly any distinction can be seen between the two exposures.

The Hon. Secretary laid on the table the two portraits of the late Mr. Traill Taylor which he had been instructed to frame, and which he had now had done.

The consideration of the alterations to the rules, and further business of the annual meeting were deferred to the next meeting.

PHOTOGRAPHIC CLUB.

JUNE 24,—Mr. Thomas Bedding in the chair.

Mr. Fry passed round some prints upon some defective paper which had been shown at the previous meeting.

Considerable discussion took place upon the probable cause of the defect which had been alleged to be due to the paste with which the labels were attached to the packets of paper, but no definite conclusion was arrived at.

Mr. Haes showed some prints made upon Dr. Liesegang's collodio-chloride paper. The prints were nine years old, and were as good as ever they were.

Mr. FOXLEE said that Mr. Bruce, of Duns, had been using the collodio-chloride process commercially for twenty years. He (Mr. Bruce) had never met with a faded print. He coated his own paper with emulsion purchased commercially—Mr. Foxlee thought from Dr. Liesegang.

Mr. Bridge showed what had been a microscopic picture of himself—made by Mr. Williams—the image of which had entirely disappeared. This was due, it was suggested, to the use of a varnish made with absolute alcohol, which dissolved the collodion and so destroyed the image.

Mr. Isenthall showed some radiograms of large dimensions. The entire arm, the leg from the knee downwards, and the chest and trunk of a man were amongst the examples. The negatives were made on plates about twenty-four inches long.

The subject for discussion which next occupied the meeting was

TONING SILVER PRINTS.

A general talk upon combined toning and fixing baths, the possibilities of toning after fixing, the advantages of adding platinum compounds to the gold bath, and the many technicalities of the various processes in vogue concluded the programme.

Hackney Photographic Society.—June 23, Mr. R. Beckett presiding.—A long and very useful discussion was held on the subjects included in the lectures on *Development* and *Printing with Silver Paper* respectively, given at preceding meetings. Mr. Dean rendered report of the excursion on the preceding Saturday to East Moulsey. Mr. GOSLING showed the results of his experiments as to modifying the focal length of a single-combination achromatic lens by placing lenses of different focal lengths in front. Thus, by using an 8-inch single lens with spectacle lenses of various foci, the following results were obtained: 8-inch single + a 30-inch positive lens = a focus of 6 inches. 8-inch single + a 30-inch negative lens = a focus of 10½ inches. 8-inch single + a 26-inch negative lens = a focus of 12 inches. 8-inch single + a 16-inch negative lens = a focus of 14½ inches. The advantage of the above arrangement was that the effect of an expensive set of casket lenses could be obtained at a cost of only 6*d.* each combination.

North Middlesex Photographic Society.—June 22, Mr. Child Bayley in the chair.—Messrs. MUMMERY and SMITH reported on the outing to Purfleet on Saturday. Mr. H. F. B. Wheeler was unanimously elected a member of the Society. Mr. TILNEY then read an extremely interesting paper entitled

OBSERVATIONS ON PICTURE-MAKING.

By means of sketches, engravings, and lantern slides kindly lent him by Messrs. F. H. Evans, J. Mummery, and S. E. Wall, he showed the reason why a picture pleased, and pointed out what to avoid. He explained the various forms of composition, and traced them out on the screen, criticising the slides as well. There was very little discussion on the paper, Messrs. Johnson, Pither, and MacIntosh making a few remarks, and the CHAIRMAN (Mr. Child Bayley), in tendering his thanks to the lecturer, said that, after the amount of trash and twaddle that had been written and spoken on this subject by incapable persons, it was a genuine pleasure to listen to a trained artist who had so full a knowledge of the subject and the power to impart it. A formal vote of thanks concluded the meeting.

Bradford Photographic Society.—On Saturday, June 20, the members of the Bradford Photographic Society held their first annual competitive excursion to Fountains Abbey, when about twenty-four took advantage of the pleasure-party tickets by the train leaving Bradford at 7.30 a.m., and another detachment (including the President) came on by the afternoon excursion. Altogether nearly 400 exposures were made, one member making forty-four, and another only eight, in cameras in all sizes, from the lordly 12 × 10 down to a quarter of a quarter-plate; in the ingenious little camera made and used by Mr. W. J. Gray. Fountains Abbey is certainly one of the finest ruins in England, and there was ample scope to show what kind of work the members are capable of turning out, and the ruins are so extensive that a full day can be spent most advantageously. One of the Vice-Presidents had thoughtfully provided a commodious yet portable changing tent, which was much appreciated, and we should certainly advise all societies visiting here to provide some such

arrangement and take plenty of plates. The early part of the day being very wet, the time was agreeably occupied in photographing the very fine cloisters, and in this way not much time was lost. The Abbey was taken from all points of view, good and bad, but the wet morning prevented certain portions being photographed under the most suitable conditions, and, there being plenty of wind, the foliage was difficult to manage. Certain accidents or omissions were, of course, inevitable. One gentleman had forgotten his tripod screw, and another had camera, lens, three dozen plates, but had left his tripod at home. The prizes offered are a silver medal, a bronze medal, framed photographs given by a Vice-President; *The Photographic Reference Book* given by another Vice-President; another, Society's certificate. The competitors are allowed until July 20 to get up their prints, but it is not yet decided who is to judge them. The Society is making headway, and the new Committee certainly are justifying their existence, and at almost every meeting two or more new members are added to the number; and, although the weather has been so very sultry, the Monday evenings are better attended than ever.

Photographic Society of Japan.—The Annual Meeting of the above-mentioned Society, for the year ending May, 1896, was held at the College of Science, Imperial University, Tokyo, on Friday, the 22nd inst., at 4.30 p.m. The Secretaries being called on for their report, the following was read:—During the past year the Society has been in a transition state, and has suffered to a certain extent in consequence. Though we have had few meetings and only one field day, there has probably been no year when the individual members have been more active than during the present one. Some of our members have carried on investigations and produced results which deserve a wide publication. The vital question, whether we shall have a home of our own, after having been referred to a competent committee, seems now to be verging towards an affirmative conclusion, and, should the plans, which are already anticipated, be carried out, we are in a way to increase even our old reputation. We are, as it seems, to advance during the present year and coming years by strictly uniting our forces and moving onwards towards better results. The Treasurers were then called on for their report. Mr. A. J. Hare explained that, in the absence of his colleague in the Treasurership, Mr. S. Kajima, jun., who was travelling in Europe, it was not possible to make out a balance-sheet. He explained, however, in general terms the financial condition of the Society. Although all the expenses of the past year came out of money collected by him (Mr. A. J. Hare) as Foreign Treasurer, he had still a balance of cash in the bank of 94·04 dollars, and this though he had to confess to remissness in collecting subscriptions. The balance in the hands of Mr. Kajima at the end of the last financial year had been 235·455 dollars, and must be more now, as it had not been drawn on at all. The officers of the Society then resigned. It was duly proposed, seconded, and carried, that, apart from the Treasurer—the Treasurership being modified on account of alteration of rules—the officers should all be re-elected. It having been announced that Sir Ernest Satow would be willing to act as Vice-President if elected, he was duly proposed, seconded, and unanimously elected a Vice-President of the Society. The question of the Treasurership then came up, and Mr. A. J. Hare, after making some objections, agreed to take the post if elected. He was duly proposed, seconded, and unanimously elected. In accordance with instructions from the Chairman, the following document, a copy of which will be sent to each member of the Society, was read:—"*Proposed Permanent Quarters for the Photographic Society of Japan.*—During the last few years the practice of photography has very greatly increased in this country. The amateur class may be said to have come into existence as an actual body, and it is coming to be recognised that, in the hands of those who have the necessary taste and artistic knowledge, photography is more than a science and a craft—it is a fine art. The greatest difficulty there has been to contend against, up to the present time has risen from the want of means of readily acquiring the necessary technical knowledge, and of having access to publications describing the latest processes, appliances, &c. The Photographic Society of Japan has filled this want so far as possible since the beginning of its existence, but it has been sadly handicapped for want of any permanent quarters. Large numbers of periodicals and books are received by the Society, and many samples of goods and useful pieces of apparatus, but there is no place in which these can be deposited so as to be available to members. In both Europe and America there are photographic societies having permanent quarters. Some of these societies are purely for artistic and scientific purposes, others combine the social element with these, and are of the nature of clubs. The Committee of the Photographic Society of Japan considers that the time has now come when the Society should establish itself in permanent quarters, which shall include dark rooms, enlarging rooms, meeting room, and reading room. In the last-mentioned there will be deposited the leading photographic periodicals of Europe and America, and the beginning of a photographic library which will, it is hoped, in time become extensive." The Committee instructed Mr. Isawa to prepare a design for such a building. There were exhibited during the meeting, by Dr. A. Wood, a very fine enlargement of a laughing girl taken whilst wading at Shiwo shi, the shell-fishing carnival that takes place at Shinagawa every spring; by Mr. T. Konishi, a casket containing a variety of lenses by Goerz; and by Mr. W. K. Burton, a stereoscopic view of the lower end of the ice cave at Shoji, taken, along with Dr. Wood, by magnesium light. The negatives had been made in two hand cameras placed side by side, the lenses being of different type and different focal length, but positive transparencies of the same, and the proper stereoscopic size, had been produced, and the effect was quite good. The prismatic effect of the magnesium light internally reflected and refracted was particularly well rendered, because the stereoscope being a cheap one had lenses not corrected for chromatic aberration. The business part of the meeting having ended, the members and visitors moved into the large hall of the College, when Professor K. Yamakawa, Ph.B., Director of the College, gave a lecture on, and demonstration of, the work of the Röntgen X rays. In spite of the vilest of weather, the attendance was good. The demonstration went off with perfect success, and was of extreme interest. The lecture included a description of original investigations by Professor Yamakawa concerning reflection and refraction of X rays.

Patent News.

The following applications for Patents were made between June 17 and June 24, 1896:—

Shutters.—No. 13,160. "Improvements in Shutters for Photographic Cameras." J. W. Jeyes and A. L. Adams.

Cameras.—No. 13,284. "Improvements in or relating to Photographic Cameras or Film-exposing Apparatus." Communicated by T. H. Blair. A. J. Boult.

Shutter.—No. 13,324. "An Improved Time and Instantaneous Roller-blind Shutter for Photographic Purposes." H. P. Tattersall.

Kinetoscopy.—No. 13,380. "Photographic Apparatus for Taking Pictures on Films and Projecting Apparatus for Displaying the Pictures on a Photographic Screen." G. Richards.

Cameras.—No. 13,425. "An Improvement to Photographic Cameras." J. Pearse.

Kinetoscopy.—No. 13,642. "Improvements in or relating to Apparatus for Use in Receiving and Projecting Photographic Images." Complete specification. A. F. Parnaland.

Cameras and Lanterns.—No. 13,674. "Improvements in or connected with Cameras and Optical Lanterns." A. Wrench.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE N. A. P. P. AND THE CONVENTION.

To the Editors.

Gentlemen,—Allow me space to say, that, as the National Convention is near (July 13), I urge all professional photographers who can spare the time, to rally round Mr. H. P. Robinson, the President for the year, and give him a hearty welcome. His writings from time to time have mostly been for the studio and for professional photographers.

I may say personally I have derived more benefit from his repeated hints as to how to conduct a studio, and manage sitters (the latter a science in itself), than from any other source.

The Convention ought this year to be a reunion of all classes, whether professional or otherwise.

The N.A.P.P., I think, have wisely arranged their outing at the same time, and from a letter I have had from Mr. Drage, the ever-active Convention Secretary, there will, I hope, be a record attendance. Just one hint more, Will members of the profession bring with them goodly specimens of their work, platinotype, and silver portraits, and views, &c.—I am, yours, &c. Thomas Fall.

9 & 10, *Baker-street, W.*

"PHOTOGRAMS" AGAIN.

To the Editors.

Gentlemen,—I regret to have to correct an egregious mistake made by one of your contemporaries, which I fear is deliberate, I wont say mischievously deliberate.

The paper to which I allude announces that at the Convention there will be an exhibition of 100 pictorial *photograms*, selected by H. P. Robinson. Now, there is no authority whatever for any such announcement in any document issued by the Council, and I am quite precisely the last person in the world to have anything to do with "photograms," a word which I feel dishonours our art. I complain with great reluctance so near our festive time, but it is just possible that, if I made no protest, my friends would assume that I had accepted the word, and may desert me in disgust and there would be no show. Let me assure them that to this little exhibition nothing but "photographs" will be admitted, and I can only express my regret that they have, either mischievously or ignorantly, been called photograms.

In ordinary life it is not considered very well behaved to "call names;" perhaps it is different in some journalistic announcements.

H. P. Robinson.

MR. CHILD BAYLEY ON ART.

To the Editors.

Gentlemen,—"Cosmos," in last week's British Journal of Photography, seems a little surprised that I have not replied to the various criticisms upon a paper read by me recently before the Photographic Club. My reason for not troubling you with a letter on the subject was

that so far I had seen little or nothing to reply to. Mr. H. P. Robinson, it is true, stated the following week that I should in the future alter my opinions therein expressed, and be sorry I had put them to paper. It is quite possible, though I trust not probable, that I shall. At any rate, Mr. Robinson has grasped the main idea of my paper to write about the subject one knows most about, and in talking of changes of opinion or of a sudden intellectual right-about-face, he is, of course, quite at home. I, too, "have known similar cases." When Mr. Robinson, however, leaves this familiar ground, and endeavours to argue that the improvement in pictorial photography has taken place since the institution of the Linked Ring, and is therefore due to it, he is dealing more or less with a science, logic, and shows, as indeed he often asserts, that this is not his *forte*. The improvement has taken place since the institution of the Linked Ring, since what I have heard described as the "purification" of another Society, since the affiliation of photographic societies, since the Institution of County Councils, and since the sinking of H.M.S. *Victoria*, and is *therefore*, no doubt, due to these occurrences. As I never said it was or wasn't, this may pass.

If your next correspondent be the talented gentleman whose pictures both in Pall Mall and Piccadilly I have often admired, he is quite consistent in deprecating, by innuendo, the fact that I wrote of matters with which I might be acquainted rather than of societies and exhibitions of which I was entirely ignorant, since he follows out this rule by producing photographic pictures, but writing on the law of averages. If the figures he quotes mean anything, they indicate clearly enough that a member of the Linked Ring stands between three and four hundred times the chance that one of the twenty thousand or so outsiders do, of getting a picture hung at the Salon.

Of other criticism I have little to complain. One gentleman connected with the press compares your humble servant with Mr. Chamberlain and with Lord Salisbury, because, presumably, they and the body they belong to are subject to repeated attacks from the party who recently suffered so heavily at the ballot boxes. The comparison may be flattering, but, when coupled with a column and a half of abuse, which is supposed "to let him off lightly," was surely unnecessary, especially as my paper was considered so dangerous that it had to be diluted by passage through my critic's brain, before in a travestied condition he put it before his readers.

As far as a definite reply is concerned, I would refer those who think it necessary to the paper itself—it contains all the reply I have to make upon points raised by myself, although, of course, no reference will be found in it to opinions saddled on me by my critics to afford them opportunities for discussion. I should like to thank "F. B." for his expression of opinion, as well as several gentlemen who have written direct to myself to a similar effect. Mr. Robinson, I trust, acquits me of "spitefulness" towards himself, with which I have been charged; it would be both unreasonable and ungrateful if I entertained any such feeling, which I don't.

R. Child Bayley.

PHOTOGRAPHING AT THE NATIONAL GALLERY.

To the Editors.

Gentlemen,—*Apropos* of the last paragraph of Mr. Newman's pathetic letter (p. 416 of your last), it may interest your readers to know that the Continental firm in question have announced the issue of an *illustrated* work on the National collection, to which Mr. Eastlake has kindly offered to contribute literary assistance.

Another interesting item is that the same firm is offering a series of small carbon reproductions of the National collection (probably printed in Germany), and are underselling the modest price hitherto asked by the Englishman here, by some 33⅓ per cent. Of course, in the "Land of the Free" all this is perfectly legitimate, but it seems to be slowly and gradually drawing on the minds of the public that far too many facilities are given here to foreign enterprise.

The question has already been before Parliament, but with abortive results. I hope on the next occasion it will be brought forward in a form that will secure its deserved attention.—I am, yours, &c., J. Liddy.

34, *Tunley-road, Craven Park, N.W.*

RE THE AFFILIATION OF PHOTOGRAPHIC SOCIETIES.

To the Editors.

Gentlemen,—May I claim space to refer to the above matter now the excitement exhibited regarding it in several quarters appears to have bubbled itself out?

The object of the movement, as I understand it, is for the benefit of those societies affiliated. Each such society elects two delegates to look after its interests. Any failure of any particular society to reap in full such benefits as are available is the failure of its own delegates to do the duty entrusted to them, any failure of the scheme as a whole, again, being simply the individual failure of each delegate.

Is it a failure as a whole? or need it be? Speaking as a delegate on behalf of the Society I have the honour to represent, I should say, certainly not. Taking up the past year, we have had, through the Affiliation scheme, at least five or six important lectures and demonstrations given us by well-known workers, and in return fifteen or sixteen lectures and lantern shows have been given by our members before other affiliated societies. These figures are well within the mark. Again, our members saved 1*l.* 5*s.* alone on admission tickets to the last Pall Mall Exhibition. Then we have had twenty-four numbers of the Royal Photographic Society's *Journal*, representing a cash value of 1*l.* 4*s.* Again, such of our members as were interested in the subjects attended the series of lectures just concluded, and paid for admission at the rate of twopence per lecture. But enough of this. Our subscription for these and other benefits is one guinea per annum. We are told in the old Book "to such as ask shall be given;" and, in regard to this scheme it is certainly no exception to the rule that "self help is the best help," and it is just this—Each society is supposed to elect representatives to do for them, viz., look after their welfare.

So far what has been said has been so said as a delegate. Now I would crave your indulgence yet a little further, that I may, as Chairman of this scheme, make one or two statements regarding it.

The series of six lectures recently given on the subject of *Photography with the Bichromate Salts* are to be published in pamphlet form, and copies will be sent each affiliated society free.

In order to extend the series of papers, lectures, &c., available for use of our societies, commissions have been placed for six fully illustrated lectures, being prepared on the following subjects:—

Pictorial Photography, by Mr. A. Horsley Hinton; Lantern Slide-making, by Mr. John A. Hodges; Negative-making; Architectural Photography, by Mr. H. W. Bennett; Intensification and Reduction, by Mr. J. McIntosh; Hand-camera Work, by Mr. W. Thomas.

These lectures, the first five at any rate of which certainly are in the hands of gentlemen eminently capable of handling their respective subjects, will be ready for circulation among affiliated societies early in October, and, as funds will allow, others will follow; but, for one year's work, twelve important lectures by experts looks somewhat unlike that moribund condition of things some would persuade the world at large exists within the camp of affiliated societies.

That there exists ample call for some such organization is clear. What we want is help. We want workers; for such there is room. Mere idle vapouring about other people's failures we have no room for, and I have taken the perhaps uncalled-for course of troubling you and your readers with this somewhat lengthy letter in order that those societies scattered about this country of ours, who only come in touch with matters of this kind through the photographic papers, may know that, if the good ship *Affiliation* is to sink, she does so "scuttled," and the gallant little band of delegates who have stood round me since my election to the chair are determined, when the end comes, if it does come, we go down with flag flying, and firing our last broadside, leaving the responsibility to attach where it should.

But are we doomed? The need for existence is still with us, and I would ask each society affiliated to see that those it elects as representatives fulfil the functions entrusted to their hands. To unaffiliated Societies at all interested in this or some similar movement I would commend the matter to their careful consideration, "for many littles make much," and with funds sufficient to work on a great deal of the trouble many societies find in providing for programmes, &c., might be lessened.

Apologising again for taking up so much of your space,—I am, yours, &c., W. Thomas, *Chairman.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

Photographs Registered:—

Mrs. J. E. Oatey, Wadebridge, Cornwall.—*Two photographs of Albert J. Henwood, Padstow, Cornwall.*

Richard Bailey, 35, Storey-square, Barrow-in-Furness, Lancashire.—*Photograph of H.M.S. "Powerful" in the Devonshire Dock, Barrow-in-Furness.*

Frank Coghlan, 31, Carlisle-road, Londonderry.—*Photograph of head and shoulders of the Rev. Denis Quigley, C.C., Londonderry. Photograph of the Rev. Denis Quigley, C.C., Londonderry. Three-quarter length cabinet.*

John Owen, 49, Broad-street, Newtown, North Wales.—*Photograph of Plas Machynlleth, with group of Royal party. Three photographs of group of Royal party at Plas Machynlleth. Photograph of the Royal procession at Machynlleth, June 25, 1896.*

George Taylor, 5, South-road, Bishop Auckland.—*Photograph of Bishop Auckland Football Team, winners of the English Association Amateur Challenge Cup, 1895–6. Photograph of Bishop Auckland Football Team and officials of the Club, winners of the English Association Amateur Challenge Cup, 1895–6.*

RECEIVED.—T. S. BRUCE; SOLIO; F. COGHLAN; and others. In our next.

A. LOMAN.—Sorry we are unable to print your letter as it stands.

A. H. CADE.—The firm, we believe, is a respectable one. Probably they are offering bromide enlargements.

ACETO asks where calcium carbide can be obtained, and the price?—In reply: Almost any dealer will procure it for you. The price ranges between 4*d.* and 1*s.* per pound.

ASSISTANTS AND THEIR GRIEVANCES.—JOHN A. RANDALL; SIDNEY LYDFORD; G. C. LAWS. We withhold your letters, as the subject has now been fully ventilated. Thanks, nevertheless.

VARNISH FOR NEGATIVES.—C. BIRD. As the varnish dries with a more or less matt surface when applied cold, try warming the plate before its application, and dry with a moderate heat.

ANILINE DYES.—W. A. T. If the colours you propose to use run, and we doubt if they will, employ those only soluble in alcohol. Why not use the colours specially sold for the purpose? there is no difficulty with them.

STRIPPING COLLODION NEGATIVES.—T. BENDON. It is quite a matter of opinion as to which is the best, French chalk or beeswax, for preparing the glass with; both answer well if properly applied. The former is perhaps the least trouble in application.

EXPIRATION OF AGREEMENT.—B. W. As the agreement was for a certain and definite term, no notice of its termination is necessary from either side. It might, however, be courteous to notify some little time ahead when it terminates, as the fact might possibly be overlooked.

SALE OF BUSINESS.—SOLD. Taking your statement as being correct, there is no doubt you have been taken in; but your difficulty will be in proving that the amount the books show was not taken, or that it was not taken as *bonâ-fide* business. If you can show that, then you will succeed in obtaining a return of the money or a portion of it.

SILVERING MIRRORS.—W. P. D. writes: "Can you inform us how to silver mirrors used in process work"—Martin's method is generally considered the best, and it is given on page 879 of the ALMANAC for the current year. Silvering mirrors is a very simple operation, though it requires some little practice to do it with certainty.

STAINED CLOTHES.—J. KINSLEY says: "Having unfortunately spilt pyrogallic acid on a light pair of trousers, will you kindly let me know which is the best means or way to remove it?"—We know of no way of taking out the stain without also interfering with the original dye of the fabric. The best way will be to send the garment to a dyer's to be dyed a darker colour.

EVELOPER.—DEVELOPER says: "I have been taking several views lately, and I cannot settle to a developer. Would you please state through your paper which developer would be the best—pyro ammonia or pyro soda—for good brisk negatives that are wanted for views?"—In reply: You had better employ whatever developer is recommended for the particular brands of plates you use.

PYROGALLIC ACID DEVELOPER FOR COLLODION NEGATIVES.—BRADFORD. Yes, wet-collodion negatives can be developed with pyrogallic acid acidified with acetic acid. Indeed, that was the developer that was always used in the early days of the process, when only iodised collodion was used. When bromo-iodised collodion was introduced, iron developer was found better, if the image was afterwards intensified with pyro and silver.

ENLARGING ON BROMIDE PAPER.—J. CARPENTER says: "Enclosed please find two bromide enlargements to show what I complain of. You will see they are of a cold and inky tone, and I can get no other. I have tried different papers, but they are all alike. I use the ferrous-oxalate developer. Can you help me with a hint or two?"—The cold tone is fully accounted for by under-exposure and forced development. Give longer exposure—double at least—and more satisfactory tones will be obtained.

A LOVERS' QUARREL.—IN A FIX says: "I had a young man and woman come to have their photographs taken together, for which the young man paid, and then the young man paid for six *cartes* of the young woman by herself. Since then they have fallen out, and the young woman forbids me giving the single photographs to the young man, and the young man demands them because he has paid for them. Will you let me know the best thing to do in the matter?"—Legally, we believe, as you did not receive payment from the young woman, you are entitled to let the young man have the photographs; but we should advise you to return the money, and decline to part with the photographs to either party until the quarrel has been smoothed over—such quarrels usually are.

PROCESS BLOCKS.—COUNTRY TYPO says: "One of my customers has supplied me with what he calls 'process blocks' to use in printing some hand bills for him at a cheap rate. I sent them in, and he has returned them, as the illustrations are so bad, and he shows me the proofs he received with the blocks, but they are printed on a very fine-surfaced and costly paper. Such impressions I find it impossible to get on the common paper I have to use. Is this the case with process blocks generally?"—Yes. Fine process blocks are quite unadapted for rough printing on common paper. It is a pity that you did not supply proofs, and explain that they were the best that the blocks would yield under the circumstances. Had your customer supplied the paper, you would have had a better case in the County Court than we fear you have now.

EMBOSSING PRINTS.—ENAMEL asks: "Where can I obtain masks or dies suitable for embossing enamelled prints? I propose to do several at one time, and use the ordinary letterpress to obtain the pressure. I do not see anything of the kind in dealers' lists, excepting so-called embossing presses, which do not meet my views either in price or practical value."—All who supply embossing presses will, doubtless, supply the masks and dies without the presses, and will, doubtless, do so cheaper than any ordinary brass-worker would make them to order. Try such houses as Marion's, Adams', Fallowfield', &c.

BOOK ON PHOTOGRAPHIC CHEMISTRY.—H. K. E. says: "I have Meldola's *Chemistry of Photography;* but, as I have not had any instruction in chemistry, I find the work too far advanced, and shall be pleased and obliged if you will recommend a suitable work that would be a 'lead up' to the one mentioned. If such a one is issued, one that will teach elementary chemistry, but principally as applied to photography, is, I think, the one I want."—In reply: There is really no book which entirely meets our correspondent's requirements. A book on the elements of organic and inorganic chemistry (to be obtained of any educational bookseller), Leaper's *Materia Photographica* (Iliffe, Coventry), Hardwich's *Photographic Chemistry* (J. & A. Churchill), will, however, probably supply between them a good introduction to Meldola's book.

MOUNTING STEREOSCOPIC SLIDES.—A. E. M. To answer your letter of eight closely written pages in detail would involve the occupation of far more space than we could spare. You had better consult the 1887 volume of the ALMANAC, where the late Mr. Traill Taylor deals with the subject of *Stereoscopic Photography* in a very full manner. In the meanwhile, the following replies to your queries suggested by the prints you enclose may be of service to you. 1. Too wide apart; you have them three and a half inches; they should not exceed three inches, and are better if only separated two and three-quarters. 2. No wonder you do not get a good effect with this slide—the picture has not been transposed in mounting. 3. Clearly the nearer the subject the nearer should be the centres of the lenses; thus, in taking portraits of a sitter removed from the camera only seven or eight feet, a separation of two and a half inches is ample. 4. Donnadieu's book has not been translated into English.

NEIGHBOURS.—AMATEUR writes as follows: "My next-door neighbour and I are not on very good terms. I have put up a studio in my garden, in which I intend, eventually, to carry on a portrait business. When I commenced to build he tried to stop the erection, but the District Council would not hear of it, as they said it was quite within their by-laws. Now my neighbour is building up his side wall, and adding another room or two to his house, which will quite stop out my principal side light, and this, he says, is his main object. Can I stop him by any process less costly than an injunction in Chancery?"—No; nor by an injunction in Chancery. Any one is entitled to erect anything he likes on his own premises, provided it does not infringe the Building Act. If your studio had been up sufficiently long—not less than twenty years—to entitle you to "Ancient Lights," the case would be different. Then the Court of Chancery would give you redress; as it is, you have none.

ANHYDROUS SODIUM SULPHITE.—C. H. C. says: "On account of the tendency of the crystallised form of sulphite of sodium to decompose by heat, and on account of the small quantities used by most amateurs, requiring frequently the loss of half-a-pound bottle or more, I have been trying for some time to use the chemical in its dried and powdered form, in which condition it seems to keep perfectly and to be unaffected by heat. It is difficult, however, to know what quantity to use in place of the crystals, and I am unable to get an answer to the query here. You will greatly oblige if you will give some definite rule or formula by which, the proper quantity of the crystals being stated, the equivalent quantity of the dry chemical can be ascertained."—We presume that our correspondent means that he is using anhydrous sodium sulphite. In that case, as, roughly speaking, the ordinary sulphite has seven parts of water of crystallisation, about half the quantity by weight of the anhydrous salt should be substituted for it.

PRINTING TROUBLES.—PAPER says: "Lately, in fact for some months past, I have been troubled with wretched ready-sensitised paper (sample enclosed), and write to ask if you will be kind enough to give your opinion on the following:—Cause of mealiness, whether it is due to sensitising or if it is, as the traveller says, 'already in the paper, when purchased by their firm?' Also, can you recommend a thorough good paper? If not, will you be kind enough to say the best means to keep paper which you make yourself, as I find mine has a decided tendency to turn yellow before the evening, when I tone? Would the bath being slightly acid help me? The paper I use takes a lot of gold and also a fearful time to tone, and the prints, when finished, are really fit only for the waste-paper basket."—Without trying the paper, in the condition it is received by the sensitisers, we cannot, of course, say whether it is their fault or that of the albumenisers, or the makers of the raw paper. It is against our rule to recommend any particular maker's wares. The sensitising bath should be decidedly acid, or the paper will not keep this weather. If the paper, both before and after printing, be stored between sheets of blotting-paper that has been moistened with a solution of carbonate of soda, and allowed to dry, its whiteness will be retained for a much longer time. The print sent seems very much as if the paper was in an abnormally dry state when it was printed; if so, that might account for the mealiness and the length of time taken in toning. Try the effect of placing the pads and backs of the frames in a damp cellar for twenty-four hours, and the paper in the same place, for a few hours before printing. That will possibly get you out of your difficulty.

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EX CATHEDRÂ.

We have received the prospectus, dated May, 1896, of the Institute of Photographic Artists "to be incorporated." The Institute, through its President, invites professional photographers to become members. The leading objects of the Institute are, briefly: To provide for (*a*) an organization of photographic artists, &c.; (*b*) the better definition and protection of the profession by the issue of certificates of membership, examination of pupils, &c.; (*c*) opportunities for intercourse, reading of papers, lectures, &c.; (*e*) the administration of a charitable fund; (*g*) and "other lawful things."

* * *

Membership is open to professional photographers, and their assistants may become "students" of the Institute. A London Fellow is asked to pay 2*l.* 2*s.* a year subscription, and 2*l.* 2*s.* as an entrance fee. Then there are Associates, who pay half these sums, and country Fellows and Associates. Fellows may put F.I.P.A. after their names; Associates, A.I.P.A. But the Institute does not intend to grant degrees. We gather from the proposed Memorandum of Association that, *inter alia*, the President and Secretary are to hold office in virtue of an agreement which has already been prepared and made between those officials and the Company.

* *

The prospectus is backed by, among other names, that of the President, Luwee Harris, Esq., F.I.A.S., whose only address is vaguely given as South Kensington; and that of the Vice-President, E. L. Toller, Esq., F.I.S.E., who just as vaguely hails from East Dulwich; while, of the Provisional Council, H. H. Robinson, Esq., F.S.I., merely dates from Brondesbury. The Standing *Council* (*sic*), Bankers, Organizing Secretary, and Secretary are named, but, while the latter official is said to live at West Brompton (which, like South Kensington, is a large suburb to date from so unprecisely), the offices are set down as at 61 & 62, Chancery-lane, W.C.

* * *

We are sorry to have to point out that the ground proposed to be covered by the Institute of Photographic Artists is already occupied more or less by existing photographic bodies, so that the necessity for the foundation of the Institute has possibly not been established. We are unacquainted with the names of the gentlemen who are promoting the Institute—a fact which we state for the information of those of our readers who may have received solicitations to become members. As to the scheme itself, we decline to express any opinions; but we venture to say that, if the Institute secures a membership in the exact ratio of its intrinsic value and possibilities, nobody will have any just cause for complaint.

* * *

The presence on our table of Messrs. Sands, Hunter, & Co.'s second-hand list of photographic apparatus gives us the opportunity of stating, in answer to some questions that have reached us this week, as well as for the benefit of our other readers, that this firm also makes a speciality of lending out cameras, lenses, &c. on hire. The charges appear to be very reasonable, and the address of Messrs. Sands, Hunter, & Co., is 20, Cranbourn-street, Leicester-square, W.C.

* * *

Last week, at the bazaar held at Queen's Hall, Regent-street, in aid of the Actors' Orphanage Fund (when, by the way, let us ask, will photographers and their assistants take the formation of a similar fund in hand?) photography of the

"while-you-wait order" was one of the means adopted by the fair organizers of the bazaar for increasing the profits. This photographic department was under the control of the charming Miss Letty Lind, with professional assistance, and a "Duplex" machine, the invention of Mr. L. Nievsky, was used. An example of the pictures thus (automatically) produced is before us, and, though the prices charged, in the name of charity, were such as would make a photographer very envious, there is no reason to be dissatisfied with the quality of the results, which are good examples of this class of tintype, the more especially as the portraits were taken in a balcony lighted from the side only.

* * *

A PROFESSIONAL reader, Mr. Frank Coghlan, of 31, Carlisle-road, Londonderry, draws our attention to the prospectus of a midsummer *fête* held in his town on June 25. Among the attractions is listed, "Artistic photography by the following ladies and gentlemen." Here are given the names of seven young ladies (they are all "misses") and eight gentlemen, who undertook to deliver photographs within one week at the prices of one shilling each for cabinets, and sixpence each for *cartes-de-visite*. We do not gather from the prospectus that the *fête* was held on behalf of any charitable institution, but we presume it was. Our correspondent thinks we should comment strongly on this matter, and condemn the principle; "if not, amateurs will shortly drive professionals out of the field." We, however, prefer to dismiss these suggestions with the remark that, as a rule, professional photographers are amply avenged by the quality of the results turned out by amateurs on these and similar occasions.

* * *

AN announcement, published in our advertisement columns last week regarding the photographing of 210 babies in seven hours with a hand camera, has brought us a communication on the subject from Mr. Owen Brooks, Photographer, of 83, Dewsbury-road, Leeds, who desires to correct Mr. Jenkinson, of Broken-hill, when he thinks no one has ever taken more babies in one day in a studio, and it would be utterly impossible with an ordinary camera. "In May of 1892, I advertised that, on the 30th and 31st, for seven hours each day (from nine to one and one till five), I would take all babies free, and give one cabinet to each mother. In the two days we took 625 babies' photographs, using an ordinary camera. For this, on June 18, 1892, I was awarded the 'Sloper Award of Merit' and the title of 'Champion Baby Photographer.'"

* * *

WE are pleased to give Mr. Brooks the opportunity of informing our readers by what feat of photographic dexterity he acquired the two distinctions that have been conferred upon him. Of course, like other champions, he must be prepared to maintain his title against all comers, and, as a result of this publicity of his powers, we should not be surprised to find that title, honourable as it is, subjected to the challenge of some ambitious rival. But, seriously, are these methods of attracting business profitable, and do they not savour somewhat of what our brother photographic editors in America term "Cheap John"-ism?

RÖNTGEN WORK FOR PROFIT.

So much has now been written on this topic that photographers are beginning to ask, "Is there money in it?" a sure sign of growing interest. The question, however, is one that cannot be answered with a plain "yes" or "no." Everything depends upon surroundings. At the outset it seems to be found that few "sitters" are to be had who will give a paying fee out of pure personal or scientific interest for any Röntgen picture of any limb or portion of their body. If a fee is to be had, it will simply be from those who require surgical diagnosis of injury, malformation, or disease of internal structures, such as can be given by this means alone. At present the main source of supply of "New Light" pictures is, firstly, one or other of the surgeons who have taken up the practice of Röntgen work as either an interesting study or for actual use in their profession. Secondly, there is also over the country a large number of scientific enthusiasts who have given great attention to the subject, purchased valuable apparatus, and made themselves thoroughly *au fait* in taking these electro-sciographs, and they have been utilised by resident surgeons for obtaining the desired representations of the lesions of such portions of their patient's frame as they are desirous of investigating. This is probably done without charge, and the professional photographer will be apt to imagine that they would interfere with any possible profit he might make.

Further, the use of the fluorescent screen lessens the need for photographic intervention, so many cases being at once diagnosed when the fluorescent picture is seen. It will, however, if the photographer is to make money out of the process, be just as easy for him to either let his surgeon clients observe the fluorescent picture alone, or to take a negative as a permanent record. There would need to be little or no difference in the fee to be charged, seeing that the capital expenditure is the same, and the time needed for putting the apparatus in working condition not much less in either case.

These preliminary aspects of the subject being duly considered, the photographer is in as good a position as possible for discovering for himself whether there is anything to be made out of Röntgen ray work. He has first to consider the capital expenditure involved, the cost of wear and tear, the probability of sitters. Our own opinion, given with every reserve, is that there ought to be, in fairly large centres of population, quite a sufficient number of cases to make it pay; and, of course, the mere bringing of patients as sitters would aid in stirring business. We hope that ere long there will be a sufficient number of professional workers who will be able to give us the benefit of their actual experience, and we should be very pleased to have the opportunity of publishing any remarks they could make.

The subject of outlay has already been treated by one of of our contributors, whose figures may be relied upon, and, if even we substitute for the Grove cells the more expensive well-known bichromate battery, with the removable elements, the best form of which is sold at about 4*l*., we find 15*l*. or 16*l*. represents the needful outlay with a three-inch spark coil. This size is a really good working instrument, moderately quick in action; but, if deep structures are to be sciographed, a five or six-inch spark coil must be used, and it would increase the first outlay by from 5*l*. to 10*l*.

These sums do not include the fluorescent screen, and it cannot be doubted that the best opinion runs in favour of those made with platino-cyanide salts. These substances are just about as dear as, or probably a little dearer than, chloride of gold, and some conception of the cost will be found when it is stated that nearly an ounce would be required for a 12 × 10 screen.

The tungstates are chosen by some workers, but the ordinary

kind of calcium tungstate does not answer in the hands of many workers. Messrs. Hopkins & Williams, however, sell a special kind, at about four times the price of their ordinary description.

Mr. Edison's screens, so much talked of, do not seem to have been tried to any practical extent. In using fluorescent screens it is desirable to take the sciograph on a celluloid film, for it is the general opinion that, if the screen is placed between hand and plate, an unpleasant amount of granularity is produced; but, by placing the fluorescent tablet on the table, then the celluloid film, sensitised side towards the tablet, and, lastly, the object to be sciographed on the top, the best effect will be obtained, the thickness of the celluloid producing no appreciable diminution of sharpness. The use of the screen by the unlversal consensus of opinion greatly reduces the exposure.

The mode of employing the screen simply as an exhibition surface is self-explanatory so long as it is remembered that the observer should be in complete darkness when making his observations. With regard to the pattern of Crookes' tube to select, the general verdict is unanimously in favour of the Jackson pattern, both for the sharpness of image and rapidity of exposure. It must be observed, however, that already several important applications of modifications of the principle of this tube have been described, and, as time progresses, we are likely to have further improvements. If any one possess one of the elder patterns of Crookes' tube, he can, of course, improve its sharpness just exactly as he would the defining power of a bad lens by the introduction of a diaphragm, which can be satisfactorily made by punching an aperture in a sheet of lead. This, as we need not observe, while increasing sharpness by reducing the emitting area, increases the exposure *pari passu*, and not at the rate of a lens diaphragm.

Finally, we would say that, in fixing his charges, the photographer must bear in mind that much time is consumed in the work, and the tubes, even apart from inevitable breakages and damages, will not last for ever; but, whether he find the adventure at once profitable or not, it would undoubtedly be a most excellent advertisement, and thus indirectly a source of profit.

DEVELOPING FORMULÆ.

It may seem rather late in the day to refer to a matter that would seem to have been thoroughly threshed out years ago, but it is probably because the subject is so apparently well understood that the desirability of once more calling attention to it arises. The circumstances that led to our now referring to the matter are as follow.

A short time back a number of negatives were submitted to us with a view to our expressing an opinion as to "what was the matter with them," and the verdict given without any hesitation was that they were much under-exposed. This was also the view of the owner of the negatives, but it was not shared by the makers of the plates, and hence the appeal to us. The plates were one of the leading brands of the highest rapidity, the exposures were all made out of doors, and were of the ordinary every-day run of snap-shot subjects, averaging about one-tenth of a second. So far there was nothing whatever to account for the results, for, with those or even much slower plates, the exposures ought to have been ample. A couple of the plates were given us to try, and under precisely similar conditions gave two faultless negatives, remarkable for the brilliancy and crispness of their detail, and their general air of "robustness," whereas those previously exhibited had been thick and muddy, and utterly devoid of any half-tone, to say nothing of shadow detail.

The conditions, we repeat, were identical, so far, at least, as choice of subjects and exposure were concerned, but development remained to be considered. The faulty negatives had been produced by means of the maker's own formula, ours were developed according to our own judgment of the treatment required under the circumstances and knowing the general characteristics of the plates. It may seem absurd to say it, but the cause of failure consisted solely in adhering too closely to the printed instructions issued with the plates.

At the present time, in the competition for the highest possible degree of rapidity attainable, it is perhaps quite true to say that more depends upon the development than upon the plate, or, at least, that the most rapid plate in reality may prove in practice much slower than it really is if not properly developed. Plate-makers therefore have worked their developing formulæ out in such a manner as to get the very utmost out of a plate under the most trying conditions. We are speaking of the ultra-rapid brands now obtainable, which in fact may be said to embody in their instructions the formulæ calculated for working the plates at high pressure, or under the least favourable conditions.

For instance, we read of plates speeded as high as 200, 300, and even 400 Hurter & Driffield, figures which, to the majority of workers, are practically meaningless, but may be faintly grasped when we say that on a bright winter day with a plate marked 50 Hurter & Driffield, and the lens working at *f*-22, we have had no difficulty in taking "instantaneous" outdoor groops in about one-tenth of a second. If we compare the value of the light in, say, January with the present time, it is almost impossible to estimate what would be the corresponding exposure requisite under similar conditions with a plate speeded at 400 Hurter & Driffield, in fact, for such work such a plate is not only unnecessary, but is actually a nuisance. The class of work for which such films are specially adapted is chiefly confined to rapid portraiture under adverse conditions of light, interiors and suchlike, when they undoubtedly prove most valuable aids, and it is in connexion with this kind of work when the full powers of the plate are required that the formulæ are calculated.

But, when plates of this degree of rapidity are applied to ordinary, every-day work, it savours somewhat of the use of the steam hammer to crack a filbert; and, though such application is perfectly possible, it necessitates something more than ordinary care to ensure success. In the case of the negatives to which we have referred, the plates were not of anything like the abnormal rapidity just spoken of, but something like 150 by the Hurter & Driffield measurement, a sufficiently high degree of rapidity, however, to require more than ordinary care when employed for well-lighted outdoor subjects, with even very short exposures; and yet, when we came to compare notes in the matter of development, we found that our unsuccessful friend had been using no less than two and a half times the quantity of alkali, and one-fourth the restraining bromide that we had ourselves employed in producing successful negatives.

The moral of this is that, although it is always a commendable practice to follow the instructions given with any make of plates, it is equally desirable that some judgment should be exercised, and in this connexion it should always be borne in mind, as has been frequently pointed out in our columns—and elsewhere—that the maker's formula generally

represents the strongest possible form of developer the plates will stand, when necessary; and that, for ordinary work, when the pressure of conditions is not great, it may be, and indeed should be, considerably modified.

Looked at from this point of view, there is scarcely a published developing formula of the present day that will not bear to have the proportion of restraining bromide at least doubled for ordinary work, and the alkali probably, at the same time, considerably curtailed. The worst that can happen, if this course be followed, is a slightly prolonged development, while, in case the exposure shall have been misjudged, there is a much wider margin for correction than would be possible if the developer were working at its utmost power.

The Guildhall Exhibition.—The loan collection of pictures in the Corporation's Art Gallery is attracting a large number of visitors, particularly on Sundays. We may remind our readers who have not yet visited the Exhibition, and intend doing so, that it closes at the end of the current month. The show is open from ten till seven on week days, and from three till seven on Sundays.

X Rays: Further Discovery.—The latest discovery, if it is possible to get "the latest" into print before a later is discovered, in connexion with the Röntgen rays, comes from Berlin. It is said that a physician there has found that the stomach and intestines can be photographed by the aid of the X rays, provided they contain solutions of metallic salts; which, he says, he finds just as impenetrable to the rays as the metals themselves. The bones, which are composed chiefly of lime, are the most impervious by the rays, of all parts of the body and it is now claimed that preparations of lime, even including lime water, are equally as opaque to them. This discovery ought, if it be as stated, to lead to further useful developments of X ray photography.

An Interesting Photograph.—Li Hung Chang is just now "the lion" on the Continent. It appears that, on his visit to that veteran statesman, Prince Bismarck, at his residence at Friedrichsruh, the two were photographed while sitting together on the terrace. The photograph has since been published in Berlin, and, we are informed, is meeting with a ready sale there. As the Celestial statesman will shortly be in this country, there is no question that enterprising portraitists here will be soliciting sittings from him, but how many will be accorded remains to be seen; also, whether the portrait will be much in demand by the British public. As a rule, the Chinese are not, or were not, much given to having themselves photographed, and generally sit with reluctance.

International Copyright.—The eighteenth congress of the International Literary and Artistic Association will be held at Berne, from August 22 to August 29. The proceedings will turn more especially on the question of literary and artistic copyright, and photography will not be overlooked. The international copyright law has been a great boon to painters, as well as photographers, in preventing the piracy of their works in foreign countries—or at least in those which are signatories to the Berne Convention of 1887, and they include the greater number on the Continent. English artists now suffer most from the piracy of their works at the hands of America. There their work is pirated in the most unscrupulous manner conceivable, as many English and Continental publishers know to their cost.

The Jackson Polar Expedition.—The steam yacht *Windward*, which started from Vardö to Franz Joseph Land one day last week, presented a very interesting appearance on her decks. In one part were stalled several teams of reindeer, in another a number of sheep, while amidships were stowed a large quantity of provender for them and stores generally. Huge ice saws and drills for clearing a way through the ice were very prominent on board. It is anticipated that the expedition will be in communication with Mr. Jackson by the end of this month or the beginning of next at the latest. It is to be hoped that this expedition, which has been so considerately planned, will be more successful, photographically and otherwise, than several that have preceded it. Many are also anxiously looking forward to the results of the balloon expedition to the Pole, as well as to the safe return of the intrepid voyagers.

The Royal Wedding.—The forthcoming wedding of the Princess Maud of Wales with Prince Charles of Denmark has been a good thing for those who have negatives of the royal pair, or of one or other of them. We are given to understand, through the trade, that the sale of the portraits has been exceedingly large ever since the announcement of the engagement was made, and still continues. This is, no doubt, due to the fact that the marriage is popular, and also that the Princess Maud, like all the Princesses of Wales, is a general favourite with the British public. It is announced that, after the wedding, there will be a grand procession of the royal party, which will include the Prince and Princess of Wales, the King and Queen of Denmark, and others of the Royal Family, from Buckingham Palace to Marlborough House, by way of St. James's-street and Piccadilly. As the time of day and season of the year will be propitious for rapid photography, there is little doubt that plenty of cameras will be seen on the route. W may call attention to the fact that cameras, even hand cameras they are seen, are not allowed in the park without a permit.

Chelsea Reach.—The London County Council does not seem to be adding to its popularity by the way it spends some, at least, of the ratepayers' money. Certainly it does not amongst artists and admirers of the picturesque generally. Just recently there was a general outcry by artists and residents in the neighbourhood, as well as the public generally, as to the way it proposed to despoil the beauties of Hampstead Heath by clearing off furze bushes, levelling up its hollows, and cutting it up with gravelled walks, according to the usual "taste" of the Council. Now it proposes to destroy the picturesqueness of Chelsea Reach, which has always been a happy hunting ground for artists, and several letters protesting against the scheme have appeared in the "dailies." Where boats and barges with their brown sails are, there can good pictures be made, even though they lie, at low water, on evil-smelling mud banks, as every photographer knows quite well. There is, however, also the question of utility, which must receive consideration. Many of our older readers will remember the picturesqueness of the Thames banks before the Victoria and Albert Embankments were constructed. The latter became necessary to preserve the great highway; but whether the same is the case with Chelsea Reach is very questionable. Baths it is considered by the Council are required at this point, and to provide them there must be an embankment, which will, of course, quite do away with the beauties of the Reach. London, and the Thames banks in its vicinity, can now ill spare any of its remaining beauty spots, and we would fain hope that this one may yet be spared us; but, in this utilitarian age, the useful generally receives more consideration than the æsthetic; though this does not always apply to the London County Council. It, in its "taste," would often destroy the latter without in any way contributing to the former—the spoliation of Hampstead Heath, to wit.

PHOTO-MECHANICAL NOTES.

THERE has always been a great deal of mystery, which, indeed, still exists, as to who was the actual inventor of the fish-glue process for half-tone printing, and what led to the use of such an odd substance. The process has been variously ascribed to Mr. F. E. Ives, Mr. Max Levy, Mr. M. Wolfe, Mr. W. H. Hyslop, Herr Heimbecker, and other American workers; but it has always been thought that Mr. Ives had the best claim to the origination of it. That gentle-

man, however, recently stated this to be a mistake, at least so far as the use of fish glue is concerned. Mr. Ives certainly did bring into use a process of burning in an "enamel" resist on copper plates in half-tone photo-engraving. He says the process was developed under his personal supervision, and was used for some years for producing blocks from his negatives before any one else adopted a similar method: it was not, however, his invention, but a modification of a French photogravure process, the formula for which was found in an old year-book. The man who did most of the work of experimenting and developing the process was an Englishman named Purton. The use of fish glue was introduced some years after the method was started, the material at first employed being a mixture of albumen and gum arabic with a little honey or glycerine to make the film hygroscopic, development being effected originally by dusting with a powdered tin salt, which prevented the formation of the hard "enamel" by heat on those parts where it adhered. The use of the tin salt was afterwards abandoned, and the washing out relied on for forming the image.

From this it appears Mr. Ives makes no claim for fish glue, nor do I believe either Mr. Levy or Mr. Wolfe, both of whose processes are understood to be on the gum basis. Either Hyslop or Heimbecker have a better claim, but I cannot say whether either were originators of the fish glue or that they only took it up after the secret leaked out. Certainly they both exploited fish glue, and their names are the only ones I have publicly heard of. Hyslop placed an "enamel" on the market, which I have tried, and do not think is anything else but a clarified fish glue, though it is essentially different in appearance to the Le Page's Clarified Fish Glue. He eventually published his formula. Heimbecker never owned up to the use of fish glue, though the stuff be supplied for the use of those who paid him for the formula was very suspiciously like it. His process was eventually exploded by one of his pupils publishing it in an American trade journal. It was the well-known formula of 2 ounces of glue, 2 whites of eggs, 4 ounces of water, and 120 grains of ammonium bichromate. About that time every half-tone worker appeared to have a secret enamel process to sell, and many were sold. This applied both to the process and to the people who bought it in many cases. I heard of one amusing case in which two operators each had an enamel process, which neither of them could work, though neither would admit it. They each believed that, if the two formulæ were compared, they would reveal something which was wanting on both sides, and eventually they agreed to exchange formulæ, upon which it turned out that both had the same thing, and both had evidently derived it from the same source viz., some trade journal.

In spite of these supposititious processes, there were on the market then, and for a year or two previous to any publication of an enamel process, some practical formulæ offered for sale by makers of screens and dealers in process appliances, and many firms, both in America and in this country, derived their earliest knowledge of the enamel process from these sources. It was found that it was not so much the formula as the manner of working it that was the valuable part of the secret, and here was where the vendors of the processes scored over the professed formulæ that were published. Many who had tried the published formulæ, and could not work them, eventually bought the instructions. The process, in fact, depended a good deal upon experience or practice, the method being so novel that operators could not be induced to shake off the habits of working and adapt themselves to the new conditions. Most of the successful enamel workers of the present day can look back on some disheartening early struggles to master the tricks of the process. They had to find out how to meet the varying viscidity and tenacity of the glue, the conditions of climatic changes, the values of bichromate in the solution, the suitability of the negative, the best methods of coating and drying, the extent to which to carry the burning in, the best method of etching, and a hundred other little things which go to make the success of the process. A great many of these points could hardly be imparted in written or printed instructions. They are just the sort of things which can only be picked up by seeing a practical man at work day by day meeting all the little difficulties as they cropped up.

Of formulæ there have been, I was going to say, hundreds published, but they hardly run to that extent. Yet the *Photographische Correspondenz*, a few months ago, tabulated comparatively twenty-four different ones, collected from various sources, and Cronenberg, in his recently published book, *Half-tone on the American Basis*, gives seven distinct formulæ. It must be seen when compared in this way that they all bear a strong family likeness. In the *Photographische Correspondenz* batch fifteen out of the twenty-four contain ordinary fish glue, three give clarified glue, and the remainder introduce a little variety with albumen (dried or fresh), gum arabic, gelatine, Cologne glue, and white glue. Sixteen formulæ give fresh egg albumen in addition to the glue, whilst only one gives albumen alone. Three give gum in addition to glue or albumen. Twenty-one formulæ out of twenty-four contain ammonium bichromate in preference to the potassium salt.

Taking the first twelve fish-glue formulæ, I find the average components to be about as follows:—

Fish glue (ordinary)	500 parts.
Egg albumen	400 „
Ammonium bichromate	37 „
Water	1000 „

This comes to pretty much the same thing as the practical formulæ in general use. There is no standard formula, because a standard would be impossible when it is well known that the glue varies in viscidity, and that sometimes it will take a larger proportion of bichromate than at other times.

A typical formula for the gum process is the following, published in 1893 along with perhaps the first fish-glue formula seen in print:—

Gum arabic (finest)	1 ounce.
Saturated sol. bichromate of ammonia	1 „
Chromic acid	10 grains.
Water	10 ounces.

The glue formula given was:—

Glue	2 ounces.
Eggs (whites)	2 „
Water	4 „
Bichromate of ammonia	120 grains.

These were published in the American *Artist Printer*, and have been extensively copied therefrom by various publications.

A modification introduced by A. C. Austin, under the title of the Adamantine Process, consisted simply of introducing well-ground lamp-black into the bichromate fish-glue solution. Others have introduced aniline dye into the solution, but this did not improve the printing quality, and it washed out before development was complete The best way has always been to stain the image with the aniline dye in the course of development.

It may be mentioned that the gum process has never been considered suitable for zinc etching, on account of the high temperature required for fully burning in the enamel. On copper it goes very well, but it is more difficult to manage in many ways than fish glue. It may be doubted whether the enamel process at its best is suitable for zinc. The intense heating changes the character of the zinc, making it soft and coarsely granular, but it is worked, nevertheless, by many on this metal.

The whole subject of these enamel processes is exceedingly interesting at the present moment, and there is a great amount of scattered information on the subject which would be valuable if brought to a focus. I hope to make some further points the subject of a subsequent article in these pages. WILLIAM GAMBLE.

MECHANICAL AIDS IN PRINT-WASHING.

I AM glad to notice, in the report of a recent meeting of the London and Provincial Photographic Association that Professor Stebbing has drawn attention to the method of print-washing that I described in an article on page 581 of last year's volume, and I am only sur-

prised that its simplicity and efficiency have not brought it into more general use. If reiteration of its good points will have any effect in bringing it into use, that must be my excuse for once more directing attention to it at a time of year when *rapid* and thorough washing are of the very highest importance.

All users of gelatino-chloride and collodio-chloride papers must be too well aware of the fact that these will not bear with impunity the same amount of rough usage that is permissible with albumen, although it is at least equally necessary to remove all soluble matter from them. Prolonged soaking in still water, with the prints massed together in contact, is worse than useless, and the old-fashioned style of mechanical washers is scarcely safe with the extremely tender modern films. The only course open for adoption is therefore the plan usually followed, of changing the prints singly from one vessel of water to another, and this necessarily involves constant attention, or practically so, during the whole period of washing, for, as soon as that attention is taken off, the prints settle down in contact with one another, and the process of diffusion, to all intents and purposes, ceases.

But under proper conditions, where diffusion can proceed freely, simple soaking in even perfectly still water, changed at intervals, is in every way as effective as the most violent *frictional* washing; indeed, it is better, for, no matter how powerful a stream of water may be directed on to the prints, it has little effect beyond cleaning the surface, the salts contained in the body of the paper, and in the sensitive films, being only removed by gradual diffusion. The simple apparatus described by Professor Stebbing and myself provides the necessary conditions, by keeping the prints rigidly separate, and at the same time permits the water to be either gradually and constantly changed, or the tank to be completely emptied and refilled instantly at intervals, without the necessity for handling each individual print.

All that is required is a tank or vessel somewhat deeper than the ordinary "deep" porcelain dishes; the washing tanks used for negatives will answer perfectly, but I prefer a deep wooden tray built up of ordinary flooring boards, which, with a very ordinary amount of care and ingenuity, can be made perfectly watertight. This has the advantage that, for a few pence, a tray of large dimensions can be made to accommodate trays which will each hold several prints, and so save the necessity for constructing a large number of individual trays. For the rest, these trays consist of light frames of wood, not necessarily more than a quarter or three-eighths of an inch deep, over which is stretched some sort of netting or open fabric, to convert them into a sort of sieve. A friend of my own uses strips of light cane, fastened together at the corners, Oxford frame fashion, and strung across after the manner of a tennis racquet, with stout ordinary thread. If of large size, these frames may be subdivided into separate cells for each single print; a frame measuring fourteen or fifteen inches square will then hold half a dozen half-plate prints.

In use the frames are filled with prints and piled one on top of another in the washing tank with a weight of some sort to prevent them floating up. The tank is then filled with water, and the prints left to soak, each one being freely exposed on both sides to the full action of the water. The tank may be provided with a syphon or overflow pipe to allow of a continuous change of water, or it may be emptied bodily at intervals by simply lifting out the whole block of trays and refilling, this plan ensuring a thorough and complete change of water. A very slight movement or agitation of the block of trays will set the water in motion over the whole surface of the prints, both back and front, and, in fact, the washing proceeds in the most thorough manner possible with a minimum of attention.

Professor Stebbing speaks of the prints being thoroughly washed with a very small quantity of water if left all night; but, though I do not say this is an injurious length of soaking, it is not desirable at the present season with gelatino-chloride paper, especially if unalumed. Practically I find an hour with a gradually changing current of water, or six or eight changes bodily, at intervals of a few minutes, will effectually remove all soluble salts, and during very hot weather I think it is indisputable that rapid washing, if thorough, is in every way desirable.

W. B. Bolton.

DYES AND PIGMENTS IN PRACTICAL PHOTOGRAPHY.

II.

2. *Pigments for Carbon Tissue.*—Pigments for the carbon process require special qualities in addition to the usual considerations of permanency. Being themselves chemical compounds with specific reactions, we have to consider their behaviour in the presence of potassium bichromate, and with the gelatine or other colloid medium employed. Of secondary, but by no means of small, importance is the degree of cohesion of the particles when the pigment is finely powdered and mixed with gelatine, and their consequent freedom from any tendency to agglomerate, instead of remaining evenly distributed through the film. This granulation is an insuperable objection to the use of certain pigments, which would otherwise be of service. The use of ordinary lamp-black, for example, has for this reason been abandoned by many workers in favour of Indian ink.

Great care must be taken not to use any pigment containing fatty matters, even in a minute degree, as these tend to form insoluble substances with gelatine and potassium bichromate. Ordinary lamp-black must, therefore, be purified from any greasy matter by washing first in benzole, and afterwards in a strong solution of potash or ammonia. Some pigments produce this insolubility of bichromated gelatine, even when pure, as, for example, the mercury compounds and many of the lakes containing a base of alumina or zinc.

The cold, black tone of pure carbon is changed to a disagreeable tint by admixture with the green alteration product of potassium bichromate. It is, therefore, necessary to add to the black some warm pigment to neutralise this effect. In the early days of the carbon process, both carmine and cochineal were used for this purpose, the fugitive character of which pigments greatly imperilled the reputation of the carbon process for permanency, since it was found that the rich, warm, photographic black thus obtained speedily relapsed into a greenish-black mixture of carbon and chromic oxide. The substitution of alizarine for carmine speedily overcame this defect, which is also obviated by Monckhoven's suggestion to use for admixture with carbon the ferric oxide precipitated in a spongy state from a ferric chloride solution. The greenish colour of the chromic oxide produced in carbon tissue becomes of still greater consequence when delicate shades of mauve or rose madder are used as pigments. For this reason it is necessary, when using these colours, to add as little bichromate as possible, and to make up for the deficiency by more prolonged exposure.

The use of the madder lakes also is not unattended with difficulty, for the permanency of this pigment seems to depend, to some extent, on the amount of alumina used to precipitate the lake; but, if enough alumina is added to ensure permanency, the pigment reacts upon the bichromated gelatine, rendering it insoluble.

This difficulty has been overcome by adding, in the first place, only just enough alumina to precipitate the lake, and then substituting another base, such as a salt of lime or magnesia, in sufficient quantity to make the colour permanent. To secure the best results, therefore, special precautions have to be taken in the preparation of lakes, some of which are found to be too soluble, and liable to stain the collodion in the single-transfer process, or else to dissolve out in the alum bath.

When using enamel papers in the carbon process, the enamel pigment should consist of some inert substance, such as kaolin; for zinc oxide, barium sulphate, and lead carbonate, are all liable to become stained by double decomposition with the bichromate.

It is often useful to employ double-tinted films for carbon work, the upper stratum containing sepia, and the lower one purple. By single transfer the films are reversed, and an image in sepia on a purple ground is produced. By this means a greater depth of tone is to be obtained than when a single colour is used. Landscapes should be in two colours of a somewhat similar nature, such as dark brown and sepia, or purple and violet. Mountainous scenes may have a lower shade of dark sepia and an upper layer of blue. By having a warm, thin, brown tone on top, and a very dark tone below, we get, not only delicate half-tones, but deep black shadows in addition.

A wide range of colours is available for the manufacture of pigmented carbon tissue, and it is possible, in many cases, to reproduce works of art in the original monochrome in which they were drawn. This is especially the case with red chalk drawings, pencil sketches, and wash drawings in Indian ink or sepia. Unfortunately, there is a very great variation in the proportion of colouring matter in commercial samples of the various pigments, and consequently great discrepancies exist in the various formulæ which have been proposed for the production of different tones. These discrepancies

are easily intolligible when it is considered that the proportion of carbon in different samples of Indian ink has been found to vary between twenty and sixty per cent. The following tables, therefore, must be regarded as giving only approximate quantities in grammes per kilogramme of gelatine:—

	Reddish-brown Tones.			Photo-tones (Purple).		Red Chalk.	Dark Brown.
Lamp-black ...	6	5	5	—	—	—	—
Indian ink ...	—	—	—	4	3	4	—
Bone black ...	—	—	—	4	3	—	15
Burnt sienna ...	12	10	15	—	—	3	—
Raw sienna ...	4	—	5	—	—	—	—
Purpurin ...	8	—	10	—	—	—	—
Prussian blue	0·5	5	0·5	—	—	—	—
Alizarine ...	—	10	—	—	—	—	—
Rose madder ...	—	—	—	3	3	—	—
Indian red ...	—	—	—	5	—	—	—
English red ...	—	—	—	—	—	2	3
Vandyke brown	—	—	—	—	—	—	2
Indigo	—	—	—	—	—	—	1

With regard to the purity of these pigments and their reaction with each other, inferior samples often lead to troubles. *Lamp-black* often contains a large quantity of ammonia, and Indian inks may be adulterated with earthy impurities. Both *Indian red* and *English red*, as now frequently prepared, contain a trace of sulphuric acid sufficient to destroy other colours such as indigo. Both *Vandyke brown* and *sepia* have recently been proved to be somewhat wanting in stability, and Professor Church has shown that a year's exposure to sunshine causes an appreciable change in colour even of the *madders*. *Prussian blue* and *indigo* are liable to oxidation by the bichromate.

To prepare the colours, it is necessary to grind them very fine on a slab with a muller, and make into a paste with a little gelatine to ensure perfect admixture with the main quantity of gelatine. For transparencies even greater care in grinding is necessary, and the pigmented gelatine must be filtered before using. Since the finest state of subdivision is necessary, it is not safe to use powdered pigments which have been kept long, on account of their tendency to aggregation. If required to be kept, it is better to mix them up with a little gelatine and let them set and dry completely, after which they can at any time be redissolved for use without the risk of agglomeration.

Ceramic Pigments.—The action of heat in the process of firing enamels precludes the use not only of organic colouring matters, which would carbonise, but also of those mineral pigments which are altered in tone at high temperatures, such as viridian, the hydrated oxide of chromium (which loses its water of hydration on heating), and volatile pigments like vermilion.

Obernetter has shown that the quality of the colour is liable to be affected by the action of potassium bichromate. This is especially noticeable when lead fluxes are used, yellow lead chromate being formed, and the resulting colour of the enamel modified in consequence. As enamel pigments usually consist of metallic oxides, which are especially susceptible to the action of acids, no powder image should be washed in acids, but rather with an alkali, such as soda, which is not only harmless in its action on the colours, but also dissolves any lead chromate which may have formed.

The action of the flux is also to be considered. Certain enamel colours, notably manganese dioxide, require alkaline fluxes, such as borax, which, however, are not always suitable, as they cause some colours to run. Lead fluxes are not so suitable for such colours as gold, purple, and cobalt blue as for the darker shades produced by the oxides of iron and antimony.

Ceramic colours are usually sold with the flux already added, the underglaze colours containing less flux than overglaze colours. If the colours are prepared specially, it must be remembered that the different oxides have different fusing points, and that the proportion of flux must be varied accordingly. If the carbon process is used for the production of the enamel, the proportion of gelatine must be increased sufficiently to hold the heavier pigments in suspension. Sometimes a little carbonaceous matter is beneficial to prevent peroxidation of protoxide colours, with a consequent loss of colour. This is especially the case with the red oxide of copper, but any carbonaceous matter is to be avoided with peroxide colours, on account of the danger of reduction to a lower degree of oxidation.

The following are the pigments recommended for the various enamel colours:—

Black.—Protoxide of iron, or manganese dioxide, with a trace of cobalt oxide, a mixture of equal parts of copper oxide, cobalt oxide, and manganese dioxide may be used.

Brown.—As above, using oxide of antimony in place of cobalt.

Purple.—Oxide of gold and manganese dioxide.

Blue.—Oxide of cobalt either alone or toned down with zinc oxide.

Yellow.—Antimoniate of lead (Naples yellow).

Green.—Chromic oxide and oxides of copper and cobalt.

Violet.—Manganese dioxide and purple of cassius.

Orange.—Red oxide of iron and oxide of antimony.

Red.—Protoxide of copper.

White.—Oxide of tin.

The flux for the ground of the enamel may be coloured in imitation of various gems by suitable admixtures of the above substances. The process of firing converts the metallic oxides into corresponding silicates. The composition of the two typical forms of flux is as follows:—

1. White Enamel.

Lead oxide	10 parts.
Tin oxide	3 „
Powdered quartz	10 „
Common salt	2 „

2. Transparent Flux or Strass.

Powdered quartz	1600 grains.
Borax	560 „
White lead	3200 „
Manganese dioxide	1 grain.

J. Vincent Elsden.

OUTSIDE STUDIO WORK.

II.

In a previous article reference was made to the great difference that existed between operating inside a studio and the all-round working of an outside operator, who has to undertake at times subjects requiring special apparatus for his work. To attempt to detail even a small portion of what may be termed special jobs of this kind would indeed be difficult. Mention, however, may be made of those subjects which require the camera being held in a vertical position; in this class we find ancient gravestones bearing inscriptions; these are often required to be photographed by antiquarians and others for the purpose of book illustrations. In work of this kind an ordinary tripod is of no use whatever unless the subject be of very small dimensions; and when such has to be undertaken, special staging must be employed, whereby the camera can be elevated to the required height and placed in a suitable position, the lens pointing downwards. To permit this being done with any degree of comfort or security, specially arranged clamping boards to carry the camera should be provided; these are two boards joined at one side by strong hinges having an eyelet in one of them, through which the camera screw passes to bind the camera; at the downmost end of this is placed a ledge of wood about three inches broad, this acts as an extra support for the front of the camera to rest upon, and relieves the extra strain thrown upon the binding screw of the camera. When such is used in this upright position, guy rods or laths are then nailed temporarily from the upright board, carrying the camera to the sides of the baseboard, resting flat on the staging, to enable which being kept absolutely steady, the service of a fifty-six pound weight will be found about as handy as anything to employ if it can be easily procured; if not, a good heavy weight of some description or other must be substituted; to balance the weight of the camera, some heavy stones are useful when more handy articles are not forthcoming.

Once an operator has so arranged his staging and a support or tripod for his camera, whereby such can be made to point downwards, he has overcome the chief difficulties in this work when such has to be performed in the open air; alas, however, such jobs have sometimes to be undertaken in interior situations where the light is very bad, in fact, quite unsuitable for photography unless recourse be had to some means of artificial lighting.

I remember one instance where the difficulties in lighting a very old tombstone were so great, that several experiments had to to be made both with slow combustion powder and also the use of lime-light jets; eventually satisfactory results were obtained by burning a plentiful supply of magnesium ribbon at several points to the side and above the camera.

I find that, as a rule, antiquarians are very particular about the correct representation of every figure or inscription such tombstones contain, hence the need for a careful preparation of the stone before

hand. I strongly advise any one having such a commission to undertake to make it distinctly understood that such cleaning, or clearing away of the dirt and rubbish of years, is in no way the duty of the photographer, but is entirely devolving on those who desire the work being performed.

To enable this being done properly is by no means so easy as many might imagine, and in some instances means a deal of bother to get even permission to lay a finger on such stones; for instance, special permission even to photograph inside our Glasgow Cathedral has to be obtained from the Commissioners of Woods and Forests in Edinburgh. Antiquarians, however, never object to spare any amount of trouble in endeavouring to decipher the most minute letterings or marks, and the services of a competent mason are nearly always required; this relieves the photographer of a large amount of risk and trouble, and should be always specially agreed upon when terms are being arranged.

When such tombstones are situated in the open air, then the work is not nearly so difficult of execution, and generally resolves into the erection of suitable fixings and the selection of the best time of day for exposure; the best result I ever saw obtained was late in the evening, when the shadows were long and low. It is wonderful what a lens and a sensitive plate will bring into view in work of this kind. I have known instances where very important detail has been divulged that was of the utmost importance to the antiquarian, and from which some very interesting deductions were made that were never thought of previously.

At the present time a heated discussion is going on between some learned gentlemen as to the burial place of one of our ancient Scottish kings, and photography has lent valuable aid in deciphering an almost obliterated inscription, upon which much depends in the way of settling a very crucial point in the argument.

The using of a camera in a vertical position to photograph numerous small objects has recently been brought prominently before the public by means of a description of a useful piece of apparatus that is now upon the market for serious outside work of the kind I have described; however, all tripods are simply useless, there is nothing better than a couple of good tressels with stout plankings thrown over them, and the flap to carry the camera as I have described.

T. N. Armstrong.

OBSERVATIONS ON PICTURE-MAKING.*

It must not be thought, however, that unity of subject can only be expressed by the singleness and isolation of the chief elements, as in the case of the mills we saw. We may have groups and masses acting as the prominent features of a scene, and these may perhaps extend over a larger portion of the area, as in the case of battle pictures. Unity of subject is really very much a mental matter and amounts to very much the same thing as unity of idea. In this reproduction of *The Lion Hunt*, by Rubens, there is no one figure that is more pronounced than another, unless, indeed, it be the warrior in the centre who is about to strike the lion with his sword. There are seven men and six animals; but only one idea—the capture and slaughter of the lion. The ground, the distance, and the sky are quite unimportant, the picture being entirely filled with the motive, which finds expression in the bustle and confusion of the episode.

The principle of massing is essential to such effects as these. A composition that is scattered is in the same degree weak, and therefore not so well able to do its work.

This view of fishing boats, by Mr. Mummery, is very satisfactorily composed, because the boats are fairly well massed. If you can conceive them more apart from each other, you will find that they would "fight," as we say. By massing them, or, rather, catching the moment when they massed themselves, which is the same thing, the operator gained unity for them, and therefore strength: we are able to think of them as *boats*, rather than as *three boats*. Their lines also come very happily: their slanting booms round off the right angles formed by the masts with the hulls and lead to the row boat in tow, tying it, or holding it, so to speak, to the mass. You will notice that the boats together make a wedge-shaped form, and the waves also are at a suitable line, opposing and balancing the line of the booms.

This pretty scene is another of Mr. Wall's. The landscape composes well, but the whole suffers from a want of massing. Had the operator exposed the plate when the ferry boat was nearer the trees, under which, if I mistake not, the landing stage is placed, the whole would have gained in strength, and, as a composition, it would have been finer. The interest would then have been massed together, for the trees constitute the chief interest in the landscape, and this should have been enhanced by the boat, which, in its present position, detracts from it.

The next slide shows what is meant in a highly satisfactory way. It will be apparent to all that, although there is an abundance of points of interest in this picture, there is, nevertheless, no rivalry between them. The steamers are primary, the barges secondary, the Tower bridge and the tugs are tertiary, and the mind is content with this arrangement, which allows the eye to be carried round in a crescent-like path from one object to another in the true order of its importance. No painter could improve on the composition of this. The horizontal lines of the bridge are well borne out by the barges at each side of the picture—an arrangement which keeps the whole restful and broad, in spite of the bustle and life of the scene. This slide is also lent by Mr. Wall.

I spoke just now of a wedge-shaped form in the picture of the boats, and also of a crescent shape in this slide. It will be found that most well-massed compositions suggest some shape to the mind, and this is a distinct advantage provided that the shape is no more than merely suggested. Thus we may have crescents, wedge shapes, spirals, S shapes, pyramidical forms, and numberless others that defy all nomenclature.

We now come to a pair, by the same artist, which show an alternative arrangement of similar elements. It is extremely interesting to get in this way two different compositions of the same subject, and much more is likely to be gleaned from them. The first one shows a very agreeable composition, taking the form of what, in copy books, is called a pot-hook. This form starts in the tree, runs down through the group of girls, then up through the cottage, and down again to finish in the man's figure. It is all very nice, only the group and the cottage struggle for a first place, and the parts are all similar in *weight*, as we say. Here, however, is another version; to my mind a better one. The cottage, by being a larger mass, becomes undoubtedly the motive of the picture, and we feel glad to have the matter settled. There is still sufficient of the pot-hook composition left, and, in addition, a great gain in breadth. We have a much finer sky, and a broad foreground, giving relief and charm to the smaller and richer parts, and this foreground is just sufficiently broken by the shadows and pebbles to prevent its looking empty; moreover, although this touches another matter entirely, the group is capital in its go and happy lack of self-consciousness.

Before we leave the subject of massing we will look at two more pictures, the first by Mr. Wall and the second by Mr. Evans. They both show that a composition may be massed to any extent, and yet be neither heavy nor dense. The delicacy of these trees and the exquisite variety of colour and wealth of detail in them will commend the picture to you, and I need say nothing of the charm of the other portions.

This is Lincoln Cathedral, seen through the trees of the Vicar's close. No one would choose such a point to view the place itself, but such an object was not in the operator's mind. His was a more subtle one. You will notice that the trees and the near houses make roughly a right angle of rather strong tone, and that the towers of the Cathedral do the same in a much more delicate colour. This is a coincidence which we can forgive the artist for making actual by backing up the thin dark stems of the trees by the broad light mass of the towers, for such a treatment, besides being an agreeable bit of pleasantry, softens the trees, gives value by contrasts to the towers, and gains solidity by massing for the upper part of the picture. In this slide we can also find an example of *repetition* in the gable of the house being overtopped by the larger one of the fane; further, an example also of what, for want of a better term, I call *building up*, which is something akin to massing, but not quite the same thing. It is seen here that the mass made by the small gable and all to the right of it, supports the larger gable and its neighbouring masses, and superimposed upon this again is the tall tower; and the whole of this mass is strengthened by the trees in front, which to the right have a similar boundary of mass to complete a pyramidal form.

But this *building up* is better exemplified in the next slide, a charming view of Belaugh Church, well beloved by visitors to the Broads. From the house and the deep shadows below we have a steady and determined building up of the mass until the church tower tops it all, gaining sublimity from its position, to which all other elements in the picture perforce contribute. If only some advantage could have been taken of a variety in colour or tone in the water, or even a small boat, thus to secure interest to the lower portion and possibly break the line, the picture would have been all the finer for it, I think. Perhaps a wherry with the sail down would not have been too overpowering for the church.

Let us now give a thought or two to *balance*. The term explains itself. Perfect balance, as it appears in absolutely symmetrical designs like those of the decorator, is not desirable in landscape art; for the

* Concluded from page 426.

reason, I imagine, that such a thing never occurred in nature, except as the result of modification by artifice.

Some figure subjects have been so composed, particularly the Early Italian altar paintings, in which it was necessary to be severe, impressive, and unlicensed; but paintings of this kind, like that also of Mr. T. C. Gotch in the present Royal Academy Exhibition, though realistic in detail, are, nevertheless, quite decorative in intention and effect. Symmetry, then, we must leave to the decorator—the ornamentalist, as some call him—and the architect. Where we employ balance, it must be of that sort only which exists in the impressions of the mind, and is too subtle to submit to measure or calculation, a compensation, as much as anything, demanding that what is weak must be opposed by a smaller amount of what is strong, or *vice versâ*. If the elements of a picture are symmetrically balanced, as would be if three trees of about the same character were placed in a row, the result would be tame, for this reason: objects that are at equal distance each from the other have a minimum of relationship to each other: there is a baldness and independence in their relative positions which awakens no interest in the mind, and the inter-spaces tell with a boring monotony. Iron railings that have no redeeming ornamental work are a sufficient instance of this. A gate is better, because the parts are usually bound together or enclosed, but this trenches upon another principle. If three objects, say, stand thus each upon its own merits and tell no tale, we feel impelled to move one. In so doing we certainly make a greater estrangement from one of those remaining, but we make also a nearer approach to the third, and thus a relationship is effected which is no longer bald. There is a tale being told, and we have, moreover, a variety in the interspaces. Here is a very fine picture of Mr. Evans's which just, and only just, escapes the unhappy arrangement I allude to. It is saved, firstly, by the further beech having a smooth trunk, which makes a slight difference in the three chief items; secondly, by the middle tree having another trunk either adjoining or quite close to it, which, with the third trunk seen beyond, helps to make a *mass* of the second and third trees and what is between them. Thus the idea of *three beeches* is somewhat modified in our minds into a *group of beeches* with *one knobbly beech in front*, which is better. In the next slide by Mr. Mummery, where the lighting, foreground, balance of light and shade, and other qualities are surprisingly fine, we find the same symmetrical disposition of the trees, which, to my mind, mars an otherwise lovely thing. One cannot help looking at the trunks in a one-two-three, three-two-one sort of way. The weight of the foremost as compared with the others would be sufficient to put matters right were not the two spaces between so similar in character and tone. Perhaps a slight change in the point of view might have made all the difference. A draughtsman would probably have altered the relative positions of the trees, or placed a figure or two in one of the spaces.

Here, however, we have balance without symmetry—a marked success—two groups of upright trees, with a straggling one nearly in the centre. The two groups obey another profound law of beauty, which is *similarity with a difference*—a most valuable principle to keep in mind. The whole arrangement here is not too central. The middle tree really springs from the right-hand group and leans over to the left one, thus having a sympathy with each and uniting both—exactly what iron railings do not do for each other. This slide and the next are both by Mr. Evans, taken in the New Forest, and at last we get the best composition of all; the single tree sufficiently opposing the line of trees which runs right into the heart of the picture. There is a distinct S shape to be seen along by the roots of the line of trees. This belongs to the province of line composition, the advantages of which are, that continuity of parts is preserved, items are connected which would otherwise be patchy, and the contours and boundaries of parts can be made to express strength, vigour, grace, or movement by its help. Here, for instance, Mr. Evans has taken in the path in the foreground on purpose that it may be traced meandering throughout the whole depth of the landscape. The power and charm of the sweep which the sinuous line takes must be felt by all. Nevertheless, there is not much interest below the trees. The scene is not a wild one; if it were, there would probably be undergrowth or bracken in the foreground. The evidence of cultivation in a wide drive of this sort suggests figures, and a child sitting near the edge of the drive in the near right-hand corner in such a way as to round it off and not clash in interest with the trees would have been sufficient to improve the long line, which it is seldom well to allow to run right slick out of the picture (to use more slang). There would have been enough plain space left to give value to the tracery of the trees above, and the strength of tone in them would have thus found a suitable echo · the little figure on the grey stretch of turf.

We must now spare a moment to the composition of line as it affected by the principle of radiation. Radiation is the sheet anchor of ornamental art, but it plays a large part in landscape also. Thi winter's view by your President might be called an ideal case, for it is an example of the radiation of lines of the most pronounced kind. There is a decided centre of the picture; the man's head, which is exactly upon the point of sight, all the leading lines radiate from that point; commencing with those of the figure itself, we see those of the road, the dog, the hedge, the fence, the horizon; and, finally, the branching of the trees, particularly the distant one, all follow the same law and meet at the same point. Now, the great advantage of this principle consists in the power it has of drawing the eye to the vortex or point where the radiation begins. It is of inestimable service in composition by reason of this power, and attention cannot be led away where it is employed. In the picture before us, however, one is tempted to think that the art has been a little unnecessarily enforced. At least, the fact that the meeting point of the lines is so near to the centre of the picture, that centre being the man's head, tempts us to think that the principle is too much in evidence, for the end of art is to hide art. Apart from this the picture is full of fine points. There is certainly no fear of a divided interest. The feeling in the figure of the wayfarer is particularly true and tender in sentiment, he is correct in tone and suitably forcible in colour.

By the same worker we have another slide which shows the principle in an excellent way. The centre is here to the left, in the group of figures, which, though a trifle picnicy—their own fault and the artist's misfortune—are suitably placed in the landscape, giving scale and life. It was just in this way that Turner's figures were placed to be a help to the landscape. A bird or a slender tree diagonally opposite to the figures would have supplied a subject which we now seem to wait for, crossing the radiating lines with a break and throwing back the foreground. The circular treatment suits the subject well, which is very beautiful in the delicacy of the distance, contrasted as it is with the well-massed foreground.

Mr. Wall here supplies an example of radiation in the sky at sunset. It is strange that sunset skies so often have the clouds—not the rays only—disposed in this way. There is a reason for it, of course, but to me, who know it not, it seems that the sun himself orders it so, to draw attention to his own glorious self.

Leaving now composition proper, we come to the art of black-and-white, light and shade, chiaroscuro, or whatever other name you choose to know it by. This is perhaps the quality next essential to photography. The Germans and Dutch have always been pre-eminent in this seductive art. It is the reverse of flatness; it secures relief, brightness, and vigour. By its aid we are able to receive a keen and delightful impression of nature without the aid of colour. Many and many a design has been saved by the timely insertion of a strong dark place or a bright light one, to the intense enhancement of all the other parts. Among all the photographs I have seen, I must confess that those of our absent friend, Mr. Evans, possess this quality in the greatest degree. He has himself told me that no photographer can do his best until he has learnt his black-and-white. I will show you one of his own slides, a stairway in the south-west turret of Lincoln Cathedral—a queer place for a photographer to go for a picture, you will say; but the result justifies the journey. In this picture there is a perfect gamut of tones, from the practically pure white on the step in the middle to the rich, impenetrable gloom of where the topmost step should be if the eye could distinguish it. It is here, and usually in most other cases also, as though a strip of material had been painted from white to black in gradation, and then bent round in a circle until the extremes met. And what force we get when extremes meet! how the one enhances the other, and how pearly the middle tones become by contrast! It is no only so in art, but in nature too; the highest light is set off by the deepest shade. You will see by this study how artful an artist Mr. Evans is. See how he frames in this little sparkling upright jewel by the grey walls that flank it, which do what a mount should do—relieve all portions. Observe how the moulding on the right wall tells against the distant lighter portions, and how its form is preserved thereby. See what radiation there is in the roofing, and how the arches recede in progression. What graduation of tone and balance of parts!

Here is another example of strong black-and-white by the same artist—a piece of nature's architecture; yet it almost looks as though the rose window had been touched in with mortal hands; but I don't know, and can't say. The illusion is certainly very good, and the formality of the composition is, therefore, not unpleasing. The pines are great in dignity.

In this landscape by Mr. Wall we have again the circle of graduated black-and-white joined at its extremes; a very charming picture, which all must admire. There are no empty spaces, and yet all is broad and large in style. The opportunity in black-and-white which the water offered has been seized and made the most of. Now another landscape by Mr. Evans, where the best possible moment has been waited for and secured. The parts appear richly in relief, and the maximum of character has been gained for the broken ground. The shadow in the valley is sufficient to give a topographical value to the spot, and yet preserve artistic effect. It seems to me that this is a triumph in the matter of a mass of detail in a broad shadow.

We now come to the observation of how *values* or the correct strength of the tones of different objects can be made to play their part in a scheme of black-and-white.

This charming little sea piece is to Mr. Wall's credit. The relative value of the darks in the ship and the waves seem to be well preserved; and the surface of the water, besides being admirably broken, well composed and well balanced against the ship in the strength of the darks, is, in consequence, as true a piece of illusion as we have seen to-night. Whenever, in looking at a view, we feel we are actually there, the fact is due to the correctness of the values of the tones. In taking artistic liberties with the toning and printing of a photograph, a great risk is run of falsifying the values of a landscape. The result is that, though a photograph so printed may make a more pleasing picture, it will probably be less like nature. Here is a very peculiar case of values, which I am told by Mr. Wall is absolutely correct; we see that parts of the sea are in strong light, of which we do not see the source. It is seldom that the sky is in all parts darker than the objects which reflect its light, still the effect has a grand and eerie look.

The same worker now affords us a good example of the gradation of tones by the agency of mist, a medium much resorted to by photographers both by natural means (as here) and by artificial.

In the next picture Mr. Evans has risen to feelings of the most poetic and sublime sort. The composition displays the Great Gable Mountain to the best advantage. In the cleverly treated road the dip has been discovered, and pressed into service to give the necessary variety. The whole is magnificently broad and solemnly lit.

I should now like to say a word or two upon *colour*, by which I mean, of course, the black-and-white, not the particular tint the picture takes in printing, although that may count for something. It is difficult to say exactly what I do mean. A copper-plate printer would describe it as the "fatness" of the darks. When it occurs in photographs, it is due mostly, I think, to the massing of the middle tones, and the blending of them with the darks, which gives a rich and luscious look, called by black-and-white artists "colour."

I have once or twice made special reference to foregrounds, and should like, before dismissing the subject, to show you one slide of the President's. In this everything takes its proper place and proper strength; it is quiet and poetic, yet has sufficient force for its subject; but I wish you particularly to note what a great advantage it is to get a foreground of this description, by means of which the other parts are sure to gain. If, on the other hand, a foreground is flat, and runs clear and unbroken out of the picture, as so many we have seen to-night do, there is an unfinished look about it which is much to be avoided. A lot can be done in extemporising foregrounds by sticking in the earth, or among sparse bushes or tall grass, similar growth or wild flowers brought from other parts of the neighbourhood. Of course, these must be arranged with due regard to fitness and truth, so that they do not prove objects of merriment to the botanist and the countryman.

And now, for the sake of completion, and at the risk of tiring you, I think something must be said on the subject of figures in landscape. The insertion of figures is, at times, a most desirable thing to the landscape artist. Not only do they give a life interest and make a work pictorial, not to say saleable, but they also afford the artist a modicum of control over the composition in hand, being, as they are, movable items where everything else—before a camera, at least—is fixed and uncompromising. As to figure subjects proper, I do not recommend them. Portraiture is apart from my subject, of course, though even portrait groups are doubtful successes artistically. I remember seeing a tale illustrated by photographs, where the result was stiffness and self-consciousness of the models, and very decided unpicturesqueness. But figures in landscape are legitimate accessories only, and therefore the risks and dangers of the faults we have noticed are reduced to a minimum. In the view I now put upon the screen, all will admit that the children in the foreground add a great charm and value to the scene. They are not too large, are of secondary interest, and in grouping, colour, force, and scale are all that could be wished, besides which they have a delightful spontaneity and unconsciousness. In the next slide we approach nearer to the portrait set in the landscape, which is what I consider a new field for portrait artists if they can achieve something of the style that Gainsborough employed—anything rather than a painted landscape on a background. The figure here is admirably spontaneous and full of life; the dog is capital, and the foreground is of the kind I much admire. By the same artist is the next slide, a group of children, which makes a hook-shaped composition. They are not, however, quite free from self-consciousness, nor are children ever so when told to pose, they should be caught in the act. Here are some by Mr. Wall which have been so caught. They, however, are *looking out of the picture*, as artists say, who have a golden rule that figures in action, or looking in a certain direction, should have the lesser portion of the field of the picture behind them. In the next case they may be seen so arranged, and you will agree as to the more satisfactory look of completeness thus secured. I must just point out the pleasing repetition in the shapes of the large and the small figure, and the further repetition of masses in the large and the small tree. You may think that such a triviality makes no impression on the mind, but I assure you it makes a very pleasing one. My last slide illustrating this topic shows a beautiful little composition, in which the boy, peacefully fishing, gives an enormous interest (fancy him omitted for a moment!), and yet preserves the tranquillity of the scene. The picture, albeit, exhibits a point upon which I have not yet touched. You will see that there is no "way out"—another jargon term of the studios. This has nothing to do with the closed gate; but simply means that the mid-distance is stretched across the whole field of the picture, and affords no glimpse of extreme distance, or even of sky. A spot or two of light might have been introduced at the deepest portion of the trees with an increase of interest and effect.

There now remain a few slides, which I shall show to you as exhibiting varying degrees of sharpness and softness of detail. The first is a shrine in Lincoln Cathedral, by Mr. Evans, which, in my opinion, is one of the best of the series. The shrine itself is admirably set off, the mass being well relieved, by the help of light against dark, at every point; the detail in the stonework is clear and well defined, as it should be in an architectural work of this sort, yet there is not the least feeling of hardness anywhere in the picture. Most of these beautiful results come from watching the subject under all conditions of lighting and choosing the best effect. The light, as here chosen, has given breadth, as a whole, to the shrine, while emphasising its parts and its general shape, the arch and receding portions being softened in a luscious and transparent shadow. The window, by having the light falling mostly upon its inner surface, is entirely without halation.

In this, by the President, the detail is softest of all; it comes almost near to being out of focus; but it is an effect which painters are constantly aiming at, and in texture it is delightfully velvety. Like the foregoing, it is a beautiful picture, and I am truly glad to have such good things to save until the last.

In conclusion, I will, in a few words, reiterate those salient points which the artist-photographer should keep in mind. We saw, first, that it is essential to have one prime interest in a picture, and as many others as may be, provided that they do not fight with the chief or even amongst themselves. This led us to the consideration that, whatever interest we chose, it should be massed; in fact, the more the primary and subsidiary interests are attached the better for the picture. Mr. Wall's steamers near the Tower Bridge was our best example of this.

We then discussed the advantage to be gained from a built-up method of composition, which gives stability, dignity, and impressiveness. I need only refer you to Turner's countless castles and churches set upon rocks and hills, to show how much grandeur is to be gained by this method.

We next spoke of balance, which must be without symmetry, and we learnt the golden phrase, *Similarity with a difference.*

Composition of line next claimed our attention, and we found that a design gains in continuity, or, as we say, "hangs together" by the use of a line (only seen when sought for), which may be traced out along the edges and contours of all the elements of a picture. It is similar in idea to the various shapes which masses may be made to take; but it must always be bold and determined, not wavering or of an unsweet curve. In the studies exhibited on the screen the line was actually supplied by a road or path; but the mere contour of an object is enough. I have here a magnificent "old master," by G. F. Watts. It is full of beautiful lines and convolutions. Very roughly, and not very ably, I have traced these lines, which, seen by themselves, teach a fine lesson in design.

The next important matter we noticed was black-and-white, in regard

to which we found that brilliancy, by contrast and gradation, was the result of judicious arrangement of these qualities; that high lights and deep shadows will give force when it is desirable that an object should tell strongly. We then spoke of *values* and their necessity to a realistic result; then of colour or rich tonality.

Next we instanced the use of suitable foregrounds to add to the completion or rounding off of a view; and finally we came to figures and their introduction into landscape to give scale and interest.

Throughout we saw the necessity of breaking straight and hard lines, and of helping them out by any elements at our disposal, or by trimming down the print. I imagine that most tricks of this sort are done by manipulation in the study. When this is the case, let me beg of you to see that the conditions of lighting in your inserted parts are similar to those already in the negative. Judge and calculate your scale by some other object in the same plane in which your added element is to appear. In inserting skies, see that they join the horizon without betraying their foreign origin by a bright line at the juncture. Look to it that your clouds are the right way up, and of the proper description for the effect in hand. Notice that you do not put your luminary or bright sky at one point, while your reflection in river or sea stares out from another place above which the sky is dark. Do not put elaborate and well-lit detail on the near side of a figure which has all the light behind it. See to these and countless other little trifles that only suggest themselves in actual work, and do not be above learning a lesson or two from painters, who, in their turn, have learnt, and are still learning, so many from you.

It only remains for me to thank you for the kind and patient way in which you have listened to my remarks, and to thank those three gentlemen whose names you have heard me repeat so often to-night for their kindness in intrusting to me the beautiful examples of their art and skill which I have thus been able to put before you. F. Colin Tilney.

PHOTOGRAPHIC WORKERS AT WORK.

IX.—Messrs. Adams & Co. in Bunhill-row.

We believe we are correct in saying that there exists an impression amongst many people that Messrs. Adams & Co., whose shops in Aldersgate-street and in the Charing Cross-road are well known to photographers, are dealers in apparatus and not manufacturers of it. Such an impression would soon be dissipated by a visit to the firm's factory in Bunhill-row, where almost everything to be met with in their warehouses may be seen in the making.

The firm, which commenced business ten years ago in a sufficiently modest manner in Charterhouse-buildings, has grown rapidly with the growth of photography as a popular pursuit, and the works which at first occupied premises in Aldersgate-buildings, were found insufficient for the demands made upon them, which necessitated about nine months ago a move into the more spacious erection they now occupy. Here Messrs. Adams & Co. possess two large floors, the first and second, the space in which is fully taken up with the machinery and benches at which cameras, changing boxes, finders, &c., are gradually evolved from the raw material.

On entering the works the first thing to which our attention was drawn was a pile of models and experimental changing boxes of one form and another, some of patterns made only to be discarded entirely, others showing earlier stages in the history of the Adams changing box itself. Here, too, we were shown a model of a hand camera of great simplicity and compactness which it is understood will be upon the market very shortly at a price which should command for it a most popular and extensive sale. On this floor are to be seen the Adams' Ideal and Vesta cameras in various stages of completion, to each of which machinery very largely contributes. How great a saving can be effected in this direction was indicated by Mr. Adams, who picked up a piece of wood in which a groove for the thumb had to be cut. "These were first made by hand," remarks he, "a quarter of a gross were turned out by a man in four hours. The same number are now made by the machine in three minutes."

In this part of the works a number of dark tents were being made, and we expressed our surprise that a form of apparatus which was so popular, not to say indispensable, in the wet-collodion days, should still be in demand. "It is largely used abroad and on board ship," says Mr. Adams, "people feel safer as regards changing if they have one of these with them in their cabin, and we get rid of a good many through export orders."

Perhaps the most interesting department in the entire factory was that in which the leather working was carried on. Three kinds of leather are in general employment here, the first being that which covers the well-known Ideal cameras. This is an ox hide which has its pattern impressed upon it by machinery. The pattern is first obtained by hand graining on a skin, which is then sent to the electro-platers. Here it is immersed in a plating bath, and a substantial electro is made of the worked surface, this electro being subsequently mounted and pressed while hot on to the smooth surface of the leather.

A seal-skin leather is that employed on the more expensive instruments, and a very fine appearance it gives them. As an example of the way in which the cost of the material for an article runs up with an increase in its size, we were shown a half-plate twin lens hand camera, which required no less than four pounds' worth of this leather to cover it. A third kind employed here is the well-known Russian leather, which is necessary in cameras made for tropical countries, to protect the bellows from the ravages of insects who have an unconquerable objection to the odour of the musk ox which pervades it.

Up above, on the second floor of the building, is to be found the gas engine which forms the motive power for the machinery, and a room devoted to woodwork. We paused a few minutes to see the circular saws and the planing machine cutting up and smoothing wood in different forms, the last-mentioned tool revolving at a high number of revolutions a minute, casting up a column of fine shavings in the air and making a deafening noise as it gripped each plank and forced it along under the whirling knife. We were glad to escape into the comparative calm of the main building, where a large number of hands were at work on what is probably the most popular of all Messrs. Adams' productions, the Brilliant View-finder.

These were to be seen in all stages, piles of the lenses and mirrors of which it is composed, stampings in brass and aluminium for the bodies and finders being put together, or finished and packed.

On this floor is to be found the usual thermometer bulb arrangement for testing the various lenses to be supplied in the hand cameras as well as an apparatus for timing shutters. This latter consists of a large dial some four feet in diameter, black in the centre, but have at the edge a circle divided into a hundred parts. The camera, the shutter of which is to be tested is fixed up in front of this dial, and an arm which carries a bright tip, distinctly visible on the blackened surface of the dial, is steadily revolved by clockwork at the rate of one revolution per second. An exposure is then made on this subject, and the duration of this exposure is seen at a glance by the number of divisions passed by the tip of the revolving arm, which is clearly shown when the plate in the camera is developed.

In this and in other ways it will be seen that great care is used in testing and examining the various productions of the factory before they are placed upon the market. The works throughout looked healthily busy, compact, and well lit, and seem in every way well suited for the operations carried out in them. We had the advantage of Mr. Adams himself as cicerone during our visit of inspection, and for the readiness with which every operation was shown to us and its nature and methods explained we felt greatly indebted to him. Our interest in everything seen there was not lessened by the fact, that we are able to speak from personal experience of the many points of excellence of the firm's hand cameras.

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The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* Journal *useful and instructive.*

Cement for Glass and Paper (to "Cimex").—Here is an original, reliable, and economical recipe I have used for years to stick chemical formulæ labels on bottles, and that is, do not throw away any spoilt or overdone P.O.P. prints but cut them up to size required, simply wet them, and place gelatine side to the glass and rub down with a cloth. I will guarantee that they will not come off. The dirtier the glass the better for the purpose.—Geo. W. Valentine.

MAGNESIUM LIGHT.—J. H. asks: "Can you inform me if any photometric measurements have been made of the relative value of magnesium light as compared with average sunshine, or, I ought perhaps to say, *actinometric*, for I wish to arrive at the approximate relative exposures necessary with sunlight and magnesium respectively under certain conditions? Any information that you or any of your readers can give me I shall be very thankful for."—Can any reader help our correspondent?

IMAGE IN CHROMATE OF SILVER (to "Chromatic").—If this correspondent will treat his films with bichromate of potash, acidified with nitric acid, the image will be converted into silver chromate readily enough, but unfortunately that salt is soluble in the excess of acid, and so undergoes solution almost as rapidly as formed. If the bichromate contain only a very minute trace of nitric acid, or even none at all, the image will be slowly converted, but the colour will then not be what I infer "Chromatic" requires, but merely a dirty, yellowish brown, with none of the characteristics of chromate of silver about it. I have more than once, upon an ordinary gelatine plate, succeeded in getting a rich, red image of chromate of silver, although varying greatly in depth in different parts of the plates, but what are the conditions that rule the uncertainty I am unable to say.—SYNTAX.

SOLUTION OF IODINE.—PERPLEXED writes: "Can you or any of your readers assist me in my present difficulty? I have been in the habit of using iodine, followed by cyanide of potassium, for clearing up the lights of my lantern slides, the form in which the iodine was employed being the 'tincture' of the chemist's shop. But recently I procured some iodine in crystals, and dissolved it myself in spirits of wine, shaking up a quantity of the crystals until the spirit would take up no more. Now, although I am sure this solution is stronger than the ordinary tincture, it refuses to mix with water at all, the whole of the iodine being apparently precipitated to form a black, muddy mess. How am I to proceed?"—The reason of the behaviour described is, no doubt, the strength of the alcoholic solution, which contains far more iodine than it should do. The crystals are soluble only to the extent of about a grain in a pint of water, but the solubility is greatly increased by the presence of a soluble iodide, such as iodide of potassium.

IMAGE IN CHROMATE OF SILVER.—J. P. writes: "In reply to 'Chromatic,' the only way, I fancy, in which he will succeed in obtaining an image in chromate of silver will be by the somewhat roundabout method to be described, in which the aid of bichromated gelatine is called in. Prepare an emulsion of carbonate of silver—it is not necessary to preserve it from the light, except very strong light—spread it upon paper, and, when dry, sensitise with bichromate of potash in the same manner as carbon tissue, and, in fact, treat it in precisely the same manner as carbon tissue. Or the bichromate may be added to the emulsion before coating. In either case the carbonate of silver is converted into insoluble chromate of silver, which forms the pigment in the finished picture. If the chromate of silver be formed by the mutual reaction of silver nitrate and bichromate of potash, it will be soluble owing to the atom of acid set free on its formation. Pictures made in this manner can be converted into chloride, bromide, or iodide of silver, and reduced to the metallic state by any of the usual developers.

ALKALINE DEVELOPMENT OF WET PLATES.—WET PLATE writes as follows: "*Apropos* of the question of alkaline development or rather intensification of wet plates, raised in The Inquirer column, I may mention my experience in that direction, not recently but some years ago when the matter was first mooted, I think by Mr. W. H. Sherman, of Milwaukee. The plan, at first sight, undoubtedly appears to be the most rational method of intensifying an image produced by building up, since, without further straining the film in that direction, a greater depth of deposit is secured by the reduction of the metal that has been acted on by light. But in practice certain conditions have to be taken into consideration which do not affect *physical* intensification, and which in some measure militate against the complete success of the chemical method. In the first place, the power of intensification is directly dependent upon the amount of the light's action, and this is materially interfered with by the image first formed, which acts as a sort of screen or 'cut off' between the sensitive film and the solution which is required to act upon it. In physical intensification the action may go on entirely regardless of the original exposure, that is to say, a faint original image may be intensified up to any degree of opacity; but in any case the action of the solution is directly upon the image to be intensified. In the case of 'chemical' intensification the action is exactly proportionate to the degree of light effect, or would be but for the more or less retardent or neutralising action of the acid developer, and the intervention of a layer of metallic silver of varying thickness on those portions of the film to be intensified. In other words, the free action of the alkaline pyro or other solution employed is very materially interfered with, both chemically and mechanically, by the formation and presence of the first image developed, and the actual addition of density is very considerably less than might be expected. This can be practically demonstrated by cutting an exposed plate in halves, developing one with alkaline pyro or ferrous oxalate, and the other by the physical method, following this with intensification by means of the same form of chemical development adopted with the first half of the plate, and carrying the action to the utmost possible limit. If the two halves be now treated with nitric acid or other silver solvent in order to remove the image, it will be found that a far stronger reverse image will be left upon the plate developed by the chemical method alone, showing that the deposited image upon the other has more than appreciably interfered with the reducing action in the other case. I should like to ask if any of your readers can suggest a feasible means of overcoming this deterrent action."

Our Editorial Table.

THE RADIANT VIEW-FINDER.

Marion & Co., Soho-square, W.

THIS Finder, the construction of which is indicated by fig. 2, gives, from its nature, a very brilliant image, and therefore is sure to be much appreciated by hand-camera workers. No mirror or ground-glass screen is employed, and a totally reflected image is obtained, which, it need scarcely be said, is a condition that makes a finder, as such, the very best *sui generis*. The illustrations, given actual size, are explanatory of the manner in which the Radiant Finder is attachable to the camera, and it is also described below.



FIG. 1.

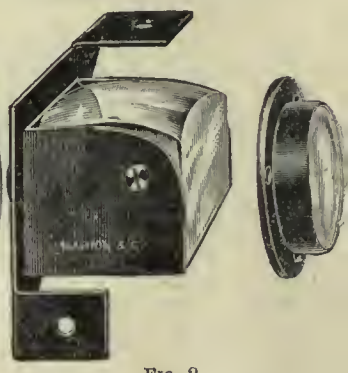


FIG. 2.

"Fig. 1 is designed for use on any camera, and is fitted with a rotating plate showing both vertical and horizontal views. In the base there are two key-hole slots for fixing to the camera by two round-head screws at top and side, placed with centres exactly one inch apart and in a line with the axis of lens.

"Fig. 2 is the form for insertion in hand cameras, one serving for both vertical and horizontal views by simply rotating it through an angle of 90°."

THE PRACTICAL PHOTOGRAPHER'S FIRST HANDBOOK.

By MATTHEW SURFACE. Bradford: Percy Lund & Co.

THIS is the ninth edition of a little work compiled for the enlightenment of novices. Mr. H. P. Robinson writes a brief but commendatory preface to the work, of which both text and illustrations are calculated to be instructive.

CATALOGUE RECEIVED.

Sands, Hunter, & Co., 20, Cranbourn-street, Leicester-square, W.C.

MESSRS. SANDS, HUNTER, & CO.'s second-hand list is devoted to the enumeration of a large stock of second-hand photographic apparatus—lenses, stand cameras, hand cameras, complete sets, and sundries in great variety.

Bruce's Matt-surface Powder.

T. S. Bruce, 6, Villas-on-Heath, The Vale, Hampstead, N.W.

Mr. Bruce, to whose retouching medium we made favourable reference some years ago, has introduced a levigated powder which retouchers, miniature painters, colourists, and black-and-white artists should find serviceable. It imparts a good tooth for retouching purposes, and is so fine that it does not scratch the film or varnish. It is also applicable to the rubbing down of prints and enlargements, cleaning ivory, the preparation of surfaces to take colour, working up, &c. We have subjected the powder to trial, and, for the many purposes for which a preparation of such extreme fineness is required, it will, no doubt, prove very useful.

Beginners' Guide to Photography.

By a Fellow of the Chemical Society.

London: Perken, Son, & Rayment 99, Hatton-garden, E.C.

A new edition—the sixth—of this concise and clearly written little guide has been issued. It remains, as hitherto, an admirable handbook to present to a beginner, who will find therein simply written directions for the use of photographic apparatus which, diligently studied, should enable him to produce good photographs with hand or stand cameras; while such advanced branches of photography as stereoscopic work and photo-micrography are also touched upon.

News and Notes.

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, July 15. Subject for discussion, *Fixing Prints*. Visitors are welcome.

The London Camera Company, having taken over the premises and plant of Mr. T. Naylor, at 13, Greek-street, Soho-square, London, W., are now in a position to execute all orders for photographic apparatus of every description without delay. The London Camera Company have made considerable additions in improved plant and machinery, and will make a special feature of repairs, fittings, and alterations.

Westbourne Park Institute.—The Sixth Annual Industrial Exhibition will be held on September 21, 22, 23, 24, 25 next. Prizes are offered for Group VII., Photography.—Section A, Indoor photography, portraits, interiors, &c.; B, Outdoor photography—(1) silver prints, (2) bromides, platinotypes, &c.; C, Instantaneous; D, Enlargements (untouched); E, Lantern slides. The General Secretary is Mr. W. J. Black, 147, Shirland-road, W.

The Great Northern Railway and the Convention.—The G.N.R. are issuing a circular giving particulars of the train service between the principal stations on and in connexion with the Great Northern system and Leeds. For the convenience of delegates (? members) who propose to reside in the neighbourhood of Leeds during the sitting of the Convention, the following arrangements for the issue of cheap tickets have been made, viz., upon production of their official passes, or letters of invitation, delegates may obtain return tickets at a single ordinary fare (minimum charge, 6*d*.) for the double journey from Leeds to any station on the Great Northern Railway not more than fifty miles distant. The tickets will be available for return on the day of issue or the following day, or from Saturday to Monday.

Directions for preparing barium platino-cyanide, the original fluorescent substance used in Salvioni's skiascope and similar devices for directly viewing Röntgen shadow pictures, are thus given in the *National Druggist*: "It can be obtained, no doubt, of any chemical works on application, but as to its cost we have no information. It can be prepared very easily by proceeding as follows: Add 3 parts of barium carbonate, in finest subdivision, and 2 parts of platinum chloride, to 10 parts of distilled water. Put on a water bath and heat. When the boiling point is nearly reached, add hydrocyanic acid, a little at a time, until the cessation of bubbles shows that carbonic acid and oxygen are no longer given off. The resulting barium platino-cyanide, after crystallisation, answers to the following formula—$Pt(CN)_4Ba+_4H_2O$."

Influence of Acetylene on Coal Consumption.—When it is considered that our coal fields are not inexhaustible, observes Dr. Frank, of Charlottenburg, the influence likely to be exerted on coal consumption by acetylene gas constitutes a subject of considerable interest. If it be admitted that ten tons of gas coal generate 2800 cubic metres (38,886 cubic feet) of lighting gas, only one-third that quantity of coal would be required to produce a ton of carbite, or 3000 cubic metres (105,949 cubic feet) of acetylene gas, having a considerably higher illuminating power than an equal quantity of ordinary lighting gas. The above figures are based upon the estimate of 2400 horse power per hour being required to produce a ton of carbite, which is now sold at 400 francs (16*l*.) per ton; but there is every reason to suppose that this price, as well as the amount of motive power, and consequently of coal, required for the production of this substance, will soon be considerably reduced. Opinions vary greatly, however, as to the yield of carbite in acetylene gas, from 225 to 350 cubic metres (mean 10,135 cubic feet) per ton being given by different authorities. Dr. Frank concludes that, although nothing definite can be predicted at present as to the final result of the struggle for supremacy by lighting gas, electricity, and acetylene, the chances are not at all unfavourable to the last-named substance.

Professor Raoul Pictet, of Geneva, lately gave a lecture at Liège on acetylene gas. During the lecture he had two candelabra, each with nine burners burning the gas, and consuming about nine and a half cubic feet per hour, little more than is consumed by a single Benzel gas burner, yet the light produced was said to be far more brilliant than the electric light. The one great drawback to the light is that, in its impure state, as prepared by the action of water on calcium carbide, the impurities present act upon metals, especially copper, and there is a liability of forming an explosive compound of acetylene and copper. Professor Pictet showed, however, that, if the gas be passed through sulphuric acid at a temperature of 50° C. below zero, the whole of these impurities are removed. If, after thus purifying, the gas is stored in nickelised cylinders and a small gasometer connected to admit of expansion, the gas can be safely used, and gives an illuminating power from fifteen to forty times that of ordinary gas. The spectrum of acetylene approaches nearly to the solar spectrum, and delicate shades of flowers, &c., are very slightly altered.

Combined Action of Light and Water in the Liberation of the Perfumes of Plants.—It is light, and not oxygen, as it has been assumed, which is the principal cause of the transformation and destruction of odorous substances, but in many cases these two agents seem to act in concert. The action of light makes itself felt in two different manners: on the one hand, it acts as a chemical power, capable of furnishing energy to all the transformations through which the odorous products pass from their elaboration to their total resinification; on the other hand, it exerts a mechanical action which plays an important part in the general life history of plants, and this property explains the mode of the periodical liberation of the perfumes of flowers. The intensity of the perfume of a flower depends on the equilibrium which is established at every hour of the day between the pressure of water in their cellules, which tends to drive outward the perfumes already elaborated contained in the epidermis, and the action of light, which combats this turgescence. The whole physiology of perfumed plants flows from this simple notion. It is thus explained why, in the countries of the East, the flowers are less odoriferous than with us; why the trees, the fruits, even the vegetables, are sometimes filled with odoriferous products more or less resinified. It is also explained why in those countries the vegetation is thorny; the vegetation in those countries has too much light and too little water.—Eugene Mesnard, in *Comptes Rendus*.

Visibility of Lights at Sea.—Special investigations have been undertaken to determine the visibility of lights at sea, by the Governments of the United States, Germany, and the Netherlands, the object being to determine the intensity of light needed to fulfil the requirements of the laws governing the rules of the road, which says that the "word visible in these rules shall mean visible on a dark night with a clear atmosphere." The result of a large number of observations by the German Committee gave as the distance at which a white light of one candle power became visible, 1·40 miles for a clear dark, 1 mile for a rainy one. At the Long Beech Light Station, the American experiments undertaken gave the following results in very clear weather:—A light of one candle power was plainly visible at 1 nautical mile; one of three candle power, at 3 miles; a ten candle power light was visible with a binocular at 4 miles; one of twenty-nine candles faintly at 5, and one of thirty-three candles visible without difficulty at the same distance. On a second evening, exceptionally clear, a white light of 3·2 candle power could readily be distinguished at 3 miles, one of 5·6 candle power at 4, and one of 17·2 at 5 miles. The Dutch Government experiments, conducted at Amsterdam, gave a light of one candle power visible at 1 nautical mile, 3·5 at 2, and sixteen at 5 miles. In the experiments with coloured lights it was found only necessary to use green, as it was conclusively proved that, if a light of that colour fulfils the required test, a red light of the same intensity will more than do so. It was found that the candle power required for a green light, to be visible at 1, 2, 3, 4 miles at sea, was two, fifteen, fifty-one, and 106 respectively. The extraordinarily rapid diminution of the green light with distance, even in good observing weather, and the still more rapid decrease in rainy weather, of a character which will but slightly diminish the intensity of white light, show that it is of the utmost importance to select for the glass a shade of colour which will interfere with the intensity of the light as little as possible. The shade recommended is a clear blue-green. Yellow-green and grass-green (says a contemporary) should not be employed at all, as they become indistinguishable from white at a very short distance. For the red light a much wider range is allowable, but a coppery red is probably the best.

The Thornton-Pickard Company's Employés' Annual Picnic.—The picnic of the *employés* of the Thornton-Pickard Manufacturing Company took place on Saturday, June 27, under almost ideal conditions. The weather was pleasant and fine, but not too warm, so that getting about was quite a pleasure. The party, numbering over 200, travelled in five saloon carriages besides engaged compartments from West Timperley Station at eight a.m. to Southport, arriving there at twenty-five minutes past nine. Both dinner and tea were sumptuously served in the Temperance Institute, London-street, a building most suitably adapted for the purpose. During the day numerous places of interest were visited, including the Botanic Gardens, Hesketh Park, Kew Gardens, Winter Gardens, &c. Boating and drives were indulged in, as were also various other amusements. After tea, Mr. Sanderson (representing the counting-house staff) said it fell to his lot to have the pleasure of moving a resolution as follows:—"The *employés* of the Thornton-Pickard Manufacturing Company, their families and friends, here assembled, desire to express their appreciation of the kindness of the firm in providing this enjoyable outing." In moving this resolution Mr. Sanderson stated that the firm had most generously undertaken the whole expense connected with this picnic; not only had they paid the travelling expenses, but they had also provided both dinner and tea, and that not for the *employés* alone, but for their wives and families, whilst the single men were at liberty to invite a friend to partake of this almost unheard-of hospitality, the only stipulation in this case being that they should pay the reduced railway fare. This was only another instance showing how deep was the interest taken both by Mr. Thornton and Mr. Pickard in the welfare of those whom they employed.

During his long connexion with the firm he had had many opportunities of noticing this, and could give almost innumerable instances proving conclusively that the motto of the firm was not "Get all you can by giving as little as you can," but that, as the business increased, as it deserved to do, they let their workmen participate in the benefits of the increase. If employers generally were like theirs, there would be less recrimination and fewer bickerings between employers and employed, and strikes would also be avoided. He was sure all would return to their duties on Monday more resolved than ever to uphold the honour and the world-wide reputation of their firm. He considered it a great honour to be connected in any way with the Thornton-Pickard Manufacturing Company, and it was with the greatest pleasure he moved the resolution. This was most ably seconded by Mr. Redhouse (the works foreman), and carried with great acclamation. The party left Southport at half-past eight in the evening after a day's pure enjoyment, arriving at West Timperley at ten o'clock. It was the unanimous opinion of all that this had been one of the pleasantest days in their lives.

Patent News.

The following applications for Patents were made between June 24 and July 1, 1896:—

Shutter.—No. 13, 701. "An Improved Photographic Shutter." W. Thomson and H. Smith.

Condensing Lenses.—No. 13,865. "Improvements in or relating to Optical Condensing Lenses." W. F. Butcher and G. Harrop.

Screens or Shutters.—No. 13,895. "Improvements in Photographic Screens or Shutters." Complete specification. J. W. McDonough.

Photographic Apparatus.—No. 13,912. "Improvements in or connected with Photographic Apparatus." J. Landsing.

Cameras.—No. 13,918. "Improvements relating to Photographic Cameras." Communicated by O. Richter. A. J. Boult.

Cameras.—No. 14,018. "Improvements in Photographic Cameras." J. Gage.

Screen Kinetoscopy.—No. 14,021. "Improvements in Apparatus for Producing and Reproducing Photographic Impressions of Moving Objects." C. C. Brodbeck.

Photographic Apparatus.—No. 14,038. "Improvements in Apparatus for Use in Taking Photographs." J. F. Parsons.

Photographic Process.—No. 14,077. "A Process for Producing Photographs in Gold, Silver, or other Metals on Polished Surfaces." H. Fowler.

Drying Plates.—No. 14,150. "Improvements in Apparatus for Drying Photographic Plates and Negatives." J. H. V. Watts.

Screen Kinetoscopy.—No. 14,305. "Means and Apparatus for Photographing Periodically." W. S. Simpson.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
13	North Middlesex	Demonstration on Venus Paper. Messrs. Milne & Co.
14	Ashton-under-Lyne	Excursion: Woodhead. Leader, Major Bradley.
14	Birmingham Photo. Society	Exhibition of Competition Pictures taken upon the Excursions to Sutton and Warwick during May.
14	Hackney	*Defects in Sensitive Plates and Negatives.* W. E. Debenham.
14	Oldham	Excursion: Peel Park Museum. Leader, T. Widdop.
15	Borough Polytechnic	Open Night.
15	Photographic Club	Fixing Prints.
13	Borough Polytechnic	Excursion: Northfleet.
18	Croydon Microscopical	Exc.: Oxted. Leader, W. M. Holmes.
18	Hackney	Excursion: Zoo. Leader, G. Guest.
18	Leytonstone	Excursion: Leigh. Leader, C. A. Russell.
18	Liverpool Amateur	Excursion: Chester Leader, Dr. Kenyon.
18	Oldham	Excursion: Smithills Hall. Leader, James Hall.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

July 2,—Adjourned Annual Meeting,—Mr. R. Beckett in the chair.

A number of alterations and amendments in the rules were made, and a Committee, consisting of Messrs. Beckett, Mackie, and Rapson, appointed to revise the wording of the same, but at the same time preserving the existing meanings. The alterations provide that the Recorder and Librarian have a seat on the Committee of Management as *ex-officio* members, and that the office of Treasurer may also be held by the Secretary. Rule II., laying down that the Secretary shall enter up the minutes, is now worded, "The minutes, &c., shall be entered in a book to be kept for that purpose." Provision is made that a special record of any future alteration in the rules, and of any resolution concerning the management of the Association shall be kept.

Mr. J. E. Hodd brought up for examination two dark slides and some plates which had been exposed in the same, and which, on development, exhibited, in places corresponding to the position of the hinges of the slide, a broad band, which was lighter or darker according to the period the plates were left in the slides. He suspected it was caused by the drill used in the hinges.

Mr. Wall said it appeared that, the longer the plate was left in the slide, the thinner the band, and the shorter the period the darker was the band. He contended that the action, which might be due to some emanation from the material of which the hinges were made, went on and brought about the effect of over-exposure. He had had a similar experience, and, although he had taken plates direct from the maker and put them in the slides in absolute darkness, and for varying periods, he had still got the band wherever the hinge came. He recommended coating the drill with bichromated gelatine, and exposing to light to get over the trouble.

The Hon. Secretary did not think it was due to penetration of light, but rather to some ingredient in the composition with which the slides were blacked.

Mr. H. C. Rapson showed a negative which had been developed, properly fixed, and washed for an hour in a shallow dish in running water. To dry quickly, it had been treated with methylated spirit, and when only half dry had been turned over, on which some drops of spirit ran back over the dry portions, leaving a mysterious deposit in the film, which he could not account for.

Mr. Henderson thought it a deposit of gum resin from the spirit, but

Mr. Haddon said it would all vanish by washing in water once more.

Mr. Rapson detailed some comparative experiments he had made with some developer provided by Mr. Henderson against pyro soda and velox, and passed round the results.

Mr. Wall said that, to make a critical test of the qualities of developers one against another, the conditions should be more constant than would be the case in exposing the plates one after the other, and using with each a different developer. He advised the Hurter & Driffield method.

The composition of the developer in question, which had been used with much advantage by Mr. Henderson, was given by him as follows:—

A.

Hydroquinone	120 grains.
Metol	60 ,,
Sodium sulphite	2 ounces.
Water	20 ,,

B.

Caustic soda	100 grains.
Sodium carbonate	120 ,,
Carbonate of potash	120 ,,
Water	20 ounces.

Make up with boiling water and boil afterwards. For use, mix equal parts

PHOTOGRAPHIC CLUB.

July 1,—Mr. Crofton in the chair.

Mr. Welford presented a diploma of the Erratic Club to the members.

The Rev. F. C. Lambert introduced the subject of the evening, viz.,

The Relative Merits of Different Intensifiers.

He showed a print from a number of "strips" of glass which had received a series of progressive exposures, and had been subsequently intensified by the following methods: A. Mercury, followed by ammonia; B. Mercury, followed by hypo; C. Mercury, followed by sulphite of soda; D. Mercury, redeveloped with ferrous oxalate; E. Mercury, followed by silver cyanide; F. Mercury and potassium bromide, followed by silver cyanide; G. Lead, followed by ammonia sulphide; H. Cadmium bromide and silver nitrate; J. Iodine and Schlippe's salt; and K. Potassium bichromate, and redevelopment with hydroquinone. The prints from these intensified slips, when compared with the unintensified negative, showed considerable variations of scale, and Mr. Lambert invited opinions upon the results. As compared with the standard print, the slips intensified by B and C showed little difference in scale, but E, F, D, M, and K all showed an apparently steeper gradation. G was unprintable owing to the intensity of the whole deposit.

Mr. Fry asked if the intensification had been carried as far as it would go?

Answer: Yes.

Mr. Mackie said that one of the things photographers often failed to remember was that it was only possible to get printable densities within certain limits. Assuming that every good negative had a certain amount of clear glass as shadow, the examples which Mr. Lambert had shown clearly indicated the amount of density which could not be exceeded without having some portions of the negative which were of no printing value. The strips marked K and M practically showed every gradation from white to black, and would, therefore, serve as guides to indicate the greatest possible density of a useful character, which such a paper as that used for printing by Mr. Lambert would render effectively.

Mr. Lambert objected that, from an artistic point of view, he did not like any clear glass on a negative, but a member facetiously remarked that the artistic argument could not be used there.

Mr. Foxlee said that Adam Salomon—who was celebrated in a previous decade for what was popularly known as Rembrandt effect—always started from bare glass—such bare glass as was only obtainable with collodion plates—and ran up the whole scale of gradation to opacity.

Mr. Fry doubted whether those characteristics which were known as "quality" and "colour" in a print could best be obtained from a negative which started from clear glass. He was speaking of the gelatine process. A negative required to possess a certain amount of resistance to the passage of light to produce the best technical effects.

Mr. Mackie contended that it made no practical difference whether the negative started from clear glass or from a slight deposit.

Mr. FRY said it would make a great difference of intensification were it to be resorted to. If the negative had clear glass shadows, intensification would always increase the contrast.

Mr. CADETT said that Messrs. Hurter & Driffield had stated that all the deposits in a perfect negative should be in the period of correct exposure, and that the representation of a black surface in a strong light should be represented by a slight deposit in the negative, and not by clear glass. He added that the fact was that our negatives were capable of representing a much longer scale than any printing paper would register, and that it was therefore always necessary to bear in mind the fact that the scale must be compressed, so far as the negative was concerned. The value of the light reflected from such surfaces as black velvet and white paper in diffused daylight was approximately as one to 300, whereas the light reflected from the deepest black in a platinum print, as compared with that reflected from the paper itself, had the ratio of one to thirty-five, and that was all that could be got from a negative, however much longer the scale of the plate might be. Glossy-surfaced paper possessed the power of rendering a more extended scale, and in that sense gave better pictures. Many artists, however, preferred the matt surfaces.

Mr. NESBIT stated that the wide range of contrast which had been alluded to seldom existed in such scenes as one desired to photograph. When it did exist, it was seldom attractive.

Mr. Lambert was thanked for introducing the subject, and the meeting closed.

Croydon Camera Club.—An excursion of sustained and keen interest was held on Wednesday, the 1st inst., by the Croydon Camera-Club, when a party of twenty-three members, in charge of Mr. Hector Maclean (the President), visited the palatial Elizabethan mansion, Hatfield House, where, by the great kindness of the Marquis of Salisbury, every facility was given the members to photograph all parts of the stately interior possessing general interest, and also to take some of the innumerable views of pictorial quality obtainable in the private gardens of this edifice, so full of interest both in regard to its connexion with the history of the Cecils and with the annals of our country since Henry VIII. This last worthy it was who first rescued Hatfield House from the comparative oblivion of an archiepiscopal palace. Had it remained in possession of the Church, it is more than likely that "Old Noll's" Roundheads would have made short work of it. Nothing at Hatfield is perhaps more impressive to the multitude than a touching memento of a great beauty and her ever-illustrious daughter—I mean a quaintly carved oaken cradle, on which are carved "A. R.," the initials of her whose fate it was

> —— "To be perk'd up in glistering grief
> And wear a golden sorrow."

This, the bassinette in which Anne Boleyn rocked Queen Elizabeth, is surely irresistible in arresting the attention and awakening the imagination of even the humblest visitor. There are also shown the trappings which the white palfrey of Good Queen Bess was harnessed with when Her Majesty reviewed her troops at Tilbury. But these are sceptically regarded, inasmuch as some historians now declare that, the appointed day being wet, the Queen did not turn out, but, local reporters having written full descriptive accounts of the proceedings in anticipation of the event, these were duly published, and hence passed into history! Happily our present age is much more conscientious, so that we can hardly imagine such things happening—no, not even in halfpenny newspapers. One thing specially grateful to the camerists was the information imparted to them that the modern and the finest portion of the mansion, which is between three and four hundred years old, is entirely the work of amateurs. If amateurs can be so supremely successful in architecture, why not in photography? This question the party put to practical test by attempting between three and four hundred views of the house and its demesne, and we have no doubt but that when, later in the year, those pleasant lantern shows are resumed at the Braithwaite Hall, a perfectly satisfactory answer will be given to the above question in the form of a brilliant series of pictures. To epitomise all the glories in art, architecture, decoration, antiquarianism, and floriculture which abound is here out of the question; enough that such imposing apartments as the famous marble dining hall, with its magnificent woodwork, and emblems of victory in the shape of Napoleonic eagle-headed banners; the long gallery, with its gilt ceiling; the armoury, with its grilled windows; the private chapel, with its full-coloured Flemish stained glass; the grand staircase, the state drawing-room, literally crammed with objects which are connected with the great people of the present century; the state bedrooms, and many more of the like, supplied more subject-matter than could be digested by even twenty cameras. The exterior views were not less entrancing, although not in all cases so suitable for photographic picturing. A word or two of praise should not be wanting for the, in many ways, charming gardens, specially delightful being the linden arcades, which form a quadrangle, in the centre of which is a most captivating pleasaunce of old English perennials, which, on Wednesday, was notable for the great masses of Oxford and Cambridge blue larkspurs, which dominated all the other floral delights. At the termination of a long day's work, the party partook of an excellent repast at the Red Lion. At the instance of the President, an enthusiastic vote of thanks was accorded to the Marquis of Salisbury for the privilege accorded to members; and, on the proposal of Mr. Underhill, seconded by Mr. Woodcock, the members' thanks were bestowed upon the President for having arranged such a notable outing. It should be added, that much of the comfort of the party was due to the admirable arrangements made as regard cheap tickets, train service, &c., by the Hon. Secretary (Mr. H. E. Holland).

North Middlesex Photographic Society.—June 30, Mr. Cox in the chair.—Mr. H. Stuart showed some carbon prints with which he had experienced some difficulty in stripping from the supports. Other members had experienced the same result, and it was put down to the hot weather. Mr. Cox showed specimens of pyramidal grain paper, which he had found gave pleasing results if sensitised either by Mr. Moss's process or plain salted silver process. He also exhibited prints on plain salted paper and a print on Kallitype paper (1891), which had not lost in intensity, and a silver print made in 1865, in which the image had not faded, although the paper and mount had slightly yellowed. The sel-d'or bath had been used in toning it. Mr. Cox called attention to an excellent article on mildew in drawing paper by Professor Russell (*Magazine of Art*, January, 1896). Messrs. Marion & Co. kindly forwarded some samples of ingenious novelties they had introduced, including the "S. B." printing frame with side clips, obviating the shifting of the print while examining; a film carrier of vulcanite, coated with an adhesive substance; and pieces of "Sweetheart" adhesive cloth for mounting prints.

JULY 6, Mr. Mattocks in the chair.—Mr. SMITH, in reporting on the outing to London Colney, said a very enjoyable afternoon was spent, a conveyance having been ordered to carry them to their destination. A number of plates were exposed, but the wind was too high for good work to be done. Mr. MUMMERY announced that Mr. Tilney's paper would be found printed *in extenso* in THE BRITISH JOURNAL OF PHOTOGRAPHY. The old question about cheap railway fares for photographers was discussed at length, the opinion being that the railway companies would not take any steps in the matter. Mr. MATTOCKS read a paper by the Rev. T. Perkins, M.A., entitled—

CRITICISM OF PAINTINGS AND PHOTOGRAPHS,

and a discussion ensued. Voting on the prints taken at the outing to Purfleet resulted in Mr. Smith being placed first and Mr. MacIntosh second.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

AN IMPORTANT DISCOVERY.

To the EDITORS.

GENTLEMEN,—I have pleasure in announcing that I have made what I consider a most interesting discovery, photographically speaking, second only to the X rays, and most likely these mysterious rays have something to do with the phenomenon. I intend bringing the matter before the London and Provincial Photographic Association on the Thursday following the Convention meeting.—I am, yours, &c.,

277, *Lewisham High-road, July* 6, 1896. A. L. HENDERSON.

MOVING PICTURES ON THE SCREEN.

To the EDITORS.

GENTLEMEN,—My attention has been drawn to your remarks under the head of *Lantern Mems* in your issue of July 3, and I would like to correct them as far as they apply to me and to my patents for taking and projecting the so-called animated photographs upon a screen.

On June 21, 1889 (which, you will notice, is two months before Croft's application), I applied with another for provisional protection for an apparatus for taking photographs in rapid series. The patent was sealed on May 10, 1890, No. 10,131. A careful search has failed to find anything on similar lines prior to this, so that you will see I am absolutely the first in the field, and the pictures that are now being taken for projection, as well as for the kinetoscope, are really taken in the way described in this patent.

Now, with regard to the projection. I applied November 29, 1893, for provisional protection for an apparatus for doing this, and it was sealed on November 29, 1894, No. 22,954, so that here again I am *undoubtedly the first*. I do not often ventilate my grievances, but I do think it necessary to place these facts before you. Will you be good enough to verify them; and, after you have done so, I have no doubt you will give as much publicity to them as you have done to the statements I wish to correct.

You go on to say I am netting about 120*l.* a week from the use of my apparatus. I only wish it were true. Unfortunately it has been my fate to sow while others reap. I can safely say that my experiments in connexion with these patents cost me over 1000*l.* in money, and no end of time, while hitherto I have had no return.

I am hoping, however, that the wheel of fortune is about to turn in my direction. If it does, I shall surely take immediate and active steps to vindicate my position.—I am, yours, &c., W. FRIESE-GREENE.

39, *King's-road, Chelsea, S.W., July* 6, 1896.

[The remarks Mr. Friese-Greene attributes to ourselves were made, we must point out, by our contributor, Mr. G. R. Baker, and the reference to the 120*l.* per week was probably not intended to apply to him. However, we ourselves, so far as we can judge of the matter, are persuaded that Mr. Friese-Greene's claims to priority in the devising of apparatus for taking and projecting "animated" photographs are well founded, and we should be very pleased to hear that his great ingenuity and hard work had resulted in the reward both unquestionably merit.—EDS.]

"PHOTOGRAMS" AGAIN.

To the EDITORS.

GENTLEMEN,—Mr. H. P. Robinson's letter in the current issue of the JOURNAL causes a sense of great relief to my feelings, which were con-

siderably shocked by the report that he had adopted a word which I, and probably most other photographers of forty years' standing, decidedly object to.—I am, yours, &c., J. A. BRANFILL.

29, *Rosendale-road, West Dulwich, S.E., July* 4, 1896.

THE PHOTOGRAPHIC COPYRIGHT UNION.

To the EDITORS.

GENTLEMEN,—From the many applications received by the Committee, there appears to be some misunderstanding on the part of some country photographers that the annual subscription is still in force. Permit me, through the medium of your valuable JOURNAL, to state that this is not the case, it having been decided at the last annual meeting to discontinue the annual subscription, and that the Union should be supported by voluntary donations by the members and those interested in the welfare of the profession. To ensure membership, all that is required is the signed adherence to the rules of the Union, a copy of which I shall be pleased to forward on application to any photographer, either professional or amateur, who would like to join us and so further strengthen the hands of the Committee in their endeavours to protect photographic copyright.—I am, yours, &c., HENRY GOWER, *Secretary.*

Botolph House, Eastcheap, London, E.C., July 6, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Percy Lloyd, Post Office, Albury, Guildford.—*Two photographs of his Grace the sixth Duke of Northumberland.*

HIRE OF APPARATUS.—AONUM; C. B.; and others. See editorial note under the heading of Ex Cathedrâ.

PREMISES.—SEVENTEEN YEARS READER. Yours is entirely a case for a solicitor, whom we advise you to consult.

CINEMATOGRAPHIC APPARATUS.—WET AND DRY. Sorry we cannot help you. Better write Mr. Friese-Greene, King's-road, Chelsea, S.W.

ADDRESS WANTED.—A. URDAN says: "How and where can the *Wiener Photographische Blätter* be obtained?"—In reply: Address the publishers, Vienna.

CEMENTING LENSES.—C. TURNER. Canada balsam is supplied by all the dealers in philosophical apparatus. It is generally sold in sixpenny and shilling bottles.

BANKRUPTCY.—OPERATOR. As you are paid quarterly, your salary will be paid in full in preference to the other creditors. You are entitled to the full quarter's salary.

PLATINOTYPE INSTRUCTIONS.—SAVOIR. Our space is too limited for what you ask. Write the Platinotype Company, Charlotte-street, Bedford-square, and they, no doubt, will oblige you with the necessary information.

ISOCHROMATIC PLATES.—J. CARTER. We know of no reliable method for the purpose. Better purchase a plate already prepared. Write Messrs. Fuerst Bros., Philpot-lane, who are the agents for Lumière's plates, or Messrs. Cadett & Neall, Ashtead.

BLINDS FOR STUDIO.—R. PHILLIPS. As the sun is only on the studio for an hour or two a day during the summer months, we should not have black blinds on that side, but dark green, and of a thick material. Ordinary window holland will answer.

PATENT AND REGISTRATION.—INVENTOR. Registration would be no protection whatever in your case. You can only secure the invention to yourself by a patent. If you register the apparatus, and put it in the market, you cannot secure a valid patent for it afterwards, as you seem to surmise.

STILLS.—R. S. W. Without a licence from the Excise, it is illegal to work a still, although it is only used for distilling water. The cost of a licence is but ten shillings a year, but the licence, if taken out, will not permit you to purify methylated spirit. That is not allowable under any conditions.

COLOURING PHOTOGRAPHS.—B. MARION. The best way will be for you to get a few lessons from a proficient, and then practise and profit by the instruction given. We cannot in this column teach you to colour photographs in oil colours, or give such instruction as to be of any real service to one who, apparently, has no knowledge whatever on the subject.

RECOVERING GOLD FROM OLD TONING BATHS.—RESIDUE says: "I should be very pleased if, through your Answers to Correspondents columns, you would inform me what is the simplest and quickest way of precipitating metallic gold from old sulphocyanide and acetate baths," &c.?—If our correspondent refers to our issue of May 1 last, he will find an article on the subject.

COPYING ENGRAVING.—A BRIGHTON AMATEUR. A lens of the "rapid" type of eleven inches focus will not copy a line engraving, with fine and crisp definition to the corners, and with perfect illumination, 15×12, even with a small stop; although the same lens may, with the smallest stop, answer for a landscape of those dimensions. By all means use the eighteen-inch focus lens for the work, and hire a camera long enough to take it.

AUTOMATIC MACHINES.—J. HITCHINS writes: "Perhaps you would give me a little information. I want to get a machine in that will get the picture finished in a minute. I suppose Nievsky's patent would be the best, but I do not know where to obtain it. Perhaps you could tell me, and also give me some idea of the price."—In reply: Write Mr. L. Nievsky, 14, Granesden-road, Shepherds Bush, who, we believe, supplies such machines.

PRISMS AND MIRRORS.—PROCESS. If the two be of equal merit—that is, if each are as optically perfect, there is not much to choose between them, except that the silver surface of the mirror has to be renewed from time to time. As optical instruments, the prisms, as met with in the market, are more perfect than mirrors, and, at the same time, are more portable and are less liable to accidental injury. On the other hand, they are more costly in the first instance.

BUILDING LAW.—S. PAGE. If your neighbour's windows, although only in an outbuilding, have been in existence over twenty years, he can certainly prevent you from building a studio that will obstruct his light, and if he goes to law on the matter he will obtain an injunction to restrain, with costs, and possibly some damages. Better make terms with him, if possible. If not, find another situation for the studio, so as not to interfere with his lights.

LANTERN-SLIDE ILLUSTRATIONS TO A BOOK.—G. M. MASON says: "Will you kindly answer the following questions: Can I make life model illustrations, *i.e.*, lantern slides, to illustrate a book, without permission of the publishers of such book, and sell copies of the slides? My illustrations would be original from the text of the book, which in itself contains no illustrations."—In reply: Yes; so long as you don't pirate the copyright of any part of the book.

DIRECTORY OF PHOTOGRAPHERS.—F. W. TASSELL says: "1. Would you kindly inform me if you know the address of a firm of photographers trading as———? 2. Could you tell me if there is a directory of photographers? or can you put me in the way of finding out if there is a firm of this name, and their address?"—1. We do not know the firm. 2. Messrs. Percy Lund & Co., Bradford, publish such a book. We do not undertake to answer questions through the post.

EXPIRATION OF LEASE.—TROUBLED. At the termination of the lease the tenancy ceases, and the landlord can, of course, make his own terms for its continuance. The fact that you have worked up a good business during the seven years is nothing to him. He will make you no allowance for that when you give up possession of the premises. He can also compel you to make good all dilapidations and leave the place in good repair, even the outbuilding you put up yourself. It does not show good business tact on your part to leave the arrangement for a new lease till a couple of months of the expiration of the current one. However, you are now in the hands of the landlord, and the only advice we can give is to make the best terms you can if you desire to continue the tenancy.

MISAPPROPRIATION OF SPECIMENS.—R. M. NELSON says: "Would you be so good as to give me your advice in reference to the following: One of my assistants left my employment and opened an opposition, and in his show-case displays a copy of a group taken by me when he was in my employ. I got my solicitor to write, asking him to remove same and return it, to which I received an impertinent letter, stating he had a group, and it was lying about, and he would send it to me when he got time, and, if I wanted any more, he would do them for me. Some time ago, in your JOURNAL, I read something on this question. My solicitor is out of town, and, before he comes back, I would feel extremely obliged if you would be good enough to put me on the proper track."—In reply: If you have registered the photograph, you can proceed for damages for infringement of copyright. Better lay the case before your solicitor. See the Copyright Act in ALMANAC for 1895.

DISORDERED TONING BATH.—SOLIO writes: "1. Why does an acetate bath go black after using but two days? It is made as follows:—12 drachms of acetate, 24 grains of gold (120 grains of chloride of gold to 15 ounces of water), and 6 pints of water, made a couple of days before using, and kept in the dark, and strengthened after using. I am using Eastman's Solio. I find, if used when in a dark state, the prints have a yellowish look. I have used the bath several years for silver paper, and it used to keep well then. Kindly give me a remedy for the same. 2. Will a bottle of water, stood in the sun for a few days, with a few drops of permanganate of potash added, answer the same as distilled water for sensitising?"—1. Unless the toning bath is made with impure materials, which is probably the case, there is something in the paper that has brought about the reduction. In that case the remedy is to make up only sufficient of the solution for the day's use. 2. Yes, nearly; but we should prefer to use a few crystals of nitrate of silver in place of the permanganate.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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EX CATHEDRÂ.

The Convention meeting that is being held this week at Leeds, promises, as may be gathered from our reports, to rank high in the scale of success that has invariably attended these gatherings. Apart from its agreeable social aspects, this particular meeting has possessed features of a distinctly useful character which are not likely to have only an ephemeral effect. We may in particular allude to the collection of modern pictorial photographs, arranged by Mr. H. P. Robinsen, the President, as establishing a precedent which it is to be hoped will be made use of at succeeding meetings, inasmuch as it indicates in what manner they may be available for educational purposes. Not merely the present position of pictorial photography, but possibly various branches of technique and processes, might usefully be illustrated in this way.

* * *

The President's Address (given elsewhere) is a characteristic production, in which Mr. Robinson airily takes occasion to reiterate his well-known views on the differences between what are called the Old and the New Photography. It is a pity that the Address could not be discussed at the Convention, otherwise much of an interesting character might have been said on several points that it raises. We, however, anticipate that the Address will attract attention in the correspondence column of the photographic press. We heartily endorse the advice Mr. Robinson gives the professional photographer; to endeavour to improve the quality of his work. When the desiderated revolution in professional portraiture arrives, then, surely, there will, or rather should be, a prosperous time for professional photography.

* * *

A question of copyright has been brought under our notice, with the request that we will not publicly divulge the particulars as to *locale* and personality, although we have no reason to doubt the absolute authenticity of the facts. While in a moral sense, no doubt, the "question of copyright" does come in, we are rather inclined to look upon the matter as a "question" of either honour or honesty—at any rate, of good taste.

* * *

It seems that the proprietors of a locally circulating weekly paper have, for some time, been publishing illustrated descriptions of mansions and places of note in the neighbourhood, the pictures being mostly supplied by a professional photographer belonging to the town, though, when the illustrations are taken from photographs by such firms as Valentine & Sons, or G. W. Wilson & Co., due recognition is given. So far so good; but these pictures have appeared bearing the name of the local professional as the author, which our informant—an amateur—avers are from photographs taken by him, or, which amounts to the same thing, from copies of his photographs, for the proprietors of the publication assert that all the *negatives* of the pictures credited to Mr. So-and-So are in their possession. Copies of the reproductions as well as of the original photographs taken by our amateur correspondent which have been sent to us leave little doubt as to who is the original author of the pictures. In other words, there is not the faintest doubt but that the half-tone etchings have been made from the amateur's originals.

* * *

A rather comic side of the question is found in the defence of the professional, who is prepared to "swear" the pictures are his own. He first inquires, sarcastically, whether the amateur "claims copyright in the point of view," and wonders

whether it ever struck him that two people could take a picture from the same standpoint. But it was pointed out to him that there are certain similarities between the amateur pictures and his alleged independently produced ones that are something more than mere coincidences. For instance, in one view, at precisely the same point, and at apparently precisely the same time of day, as shown by the shadows, there appear in both pictures a man and a barrow; and, moreover, a besom, a rake, and a spade are leaning against the barrow in exactly the same positions in each case. In reply to this, the photographer says, that "after inquiry" he finds that the same gardener has been employed on this estate for upwards of twenty years, so that "there is nothing surprising in his appearing in both the photographs." However, it is not the question of the *same man* appearing—for he is practically unrecognisable or uncomparable in the reproduction—so much as his occupying just the same position at the same time of day, and with the very same tools. Gardeners, we know, have to be men of very regular habits; but this, at least, seems to us to be straining a point a little too far.

* * *

However, as a question of copyright—leaving altogether out of sight this particular case—what is the position of a photographer or a publisher who uses his work, who "pirates" the work of another, keeping himself just beyond the bounds of legal proof of his delinquency? For, as in this case, as well as in another of a very similar character that came under our notice some years ago, there may be strong moral evidence that does not amount to proof. In the Gambier Bolton case the only legal proof of piracy was found in the reproduction of the scar or abscess on the tiger's jaw, which, however, served to turn the scale in the interests of justice. In the case we have cited above, if a jury should decide that it was impossible to recognise the gardener as the same in the two pictures, or, identifying him as the same, found that it was not impossible that he might have been taken on two separate occasions, would the other overwhelming "coincidences" have to be put on one side as merely circumstantial evidence of no legal value?

* * *

A correspondent writes, *àpropos* of Mr. Friese-Greene's letter in last week's issue, on the subject of priority of invention in the moving photograph business, that every one seems to have entirely overlooked Muybridge in this connexion, and points out that, some years before the dates mentioned by Mr. Friese-Greene, Muybridge exhibited his apparatus with almost as formidable a name as the more modern ones, both in this country and in Paris, and probably he was the individual referred to by Mr. A. L. Henderson a week or two ago as having exhibited in Brussels. Without referring to published reports, we cannot fix the exact date, but it must have been somewhere in the early or mid "eighties" that we, in company with a distinguished party, including the Prince and Princess of Wales and their daughters, listened to a lecture by Muybridge at the Royal Institution, and saw for the first time his "something"-praxiscope in action, and either the following or the preceding evening we were present at Burlington House when he explained his methods and apparatus at the *soirée* of the Royal Academy.

* * *

There was one very funny incident on the occasion of the lecture in Albemarle-street. The picture on the screen represented a number of deer running in a semi-wild state, in some "park," in the States, and something unfortunately went wrong with the machinery, which began to run more and more slowly, until, finally, it came to a stand-still. Mr. Muybridge was compelled to leave his position on the platform—with a muttered remark that sounded, from our distance, to say the least, suspicious—and proceeded to investigate matters at the lantern. After a short time, things began to move again slowly, but with a most comical result, for a fine young stag, that occupied the centre of the picture, commenced to advance with his fore leg, while his hind quarters remained stationary, until his body appeared to be about the length of an ordinary Pullman car. Then Muybridge looked up, and the light went out suddenly, until matters had been satisfactorily arranged. Although Mr. Muybridge declared afterwards, it was not a rehearsed scene, it was undoubtedly the most popular portion of the evening's performance.

* * *

On the occasion of the same visit to this country, Mr. Muybridge lectured before the Society of Arts, and at Eton College, besides a great many more places, and, although his results were not precisely like those shown at the present time, he can, no doubt, make a strong claim to priority in the matter of public exhibitions of moving photographs.

* * *

It is scarcely credible at the present day, when almost everybody who has exposed a dozen plates wants to write a guide to photography, that there should exist individuals who seem to be really honest in their simplicity, but such a case has just cropped up. An amateur of not immature years was advised a short while back to use starch instead of gum arabic for mounting purposes, but in a few days returned in high dudgeon to complain that the stuff would not stick at all. We suggested he perhaps did not put enough starch on to the print, or, possibly, he rubbed it down too much, and so expelled the greater part of the mountant, but a specimen peeled print had quite the opposite appearance, the starch lying in thick layers on the bare mount.

* * *

Then we noticed that it had a very powdery appearance, and was easily rubbed off, and the cause of the difficulty began to loom in view. "How did you mix the starch?" we asked. "Oh, with water!" "Yes; but did you boil it or use boiling water?" "No, just stirred it up, as you said, into a thick paste." We then proceeded to explain that that way of mixing was not much use, that the starch must be boiled, or, at least, made with boiling water, and must assume the appearance of a transparent jelly. Our friend retired apparently satisfied, but will it be believed he came back next day to tell us that his housekeeper said that starch "didn't want boiling, it was 'cold-water' starch!" We told him he had better take his housekeeper as his photographic instructor, and he would be sure to do well.

POINTS FOR CONSIDERATION IN PURCHASING A PHOTOGRAPHIC BUSINESS.

Our advertisement columns of late have shown that there have been, and are, a large number of photographic businesses in the market. This, no doubt, accounts for the number of letters received with reference to the value of the goodwill of photographic

businesses—whether it is based upon the gross returns or the net profit, &c. We have also received letters as to alleged misrepresentations in the sale of businesses, based upon the circumstance that the purchaser has not done the same amount of trade that the vendor did, or stated he did.

The value of the goodwill of a photographic business—we are dealing with portrait businesses only—cannot be appraised by any set rule, as is the case with many other businesses, so much must necessarily depend upon collateral circumstances. For example, take two businesses, each making the same returns, say, 1000*l.* a year. In the one the prices range fairly high, say, on a guinea a dozen for cabinet portraits base, while, in the other, they rule low—half the price or less. Now, it is obvious that, although both businesses return the same gross receipts, there is a vast difference in the net profits of the two. In the latter, considerably more than double the plates, paper, mounts, and material generally are necessary, as well as considerably more labour, though possibly of not quite so expensive a kind; also it will entail more supervision and business anxiety on the part of its proprietor than will the other, which requires a less number of hands for its working. Hence it will be seen there is a very great difference in the market value of the two concerns.

In estimating the value of many businesses, the average receipts for the previous three years are taken as a basis. When this is done in photography, the last year is the most important for consideration, for it is clear that, if this is less than the previous ones, it shows that the business is on the decline. If, on the other hand, it is more, it indicates that it is increasing, and an increasing business is obviously of more value than a diminishing one. Another matter for consideration is opposition in the neighbourhood. A business that is surrounded by a considerable number of competing ones is clearly not equal in value to one where there are none or very few. A small business is not worth so much proportionately as a moderate one, all things being equal, because, in the former, a certain number of hands must be engaged, such as reception-room attendant, printer, &c., and there is often not sufficient work to fully occupy their time, whereas there is in the latter. Therefore the labour costs no more in the moderate business than it does in the smaller one, where a larger amount of work is turned out.

Considerable importance is often attached to the number of negatives in store. At one time this was a more important item than we are given to understand it is now, except in the case of publication portraits, because, as prices are now generally much lower than they used to be, so many, especially ladies, prefer to have fresh sittings in their latest costumes to ordering duplicates from old negatives. Therefore, except in the case of deceased persons or notabilities, a large collection of old negatives is not worth what it used to be in former times.

Here is another point that should be considered in purchasing a portrait business, namely, the lines upon which it has been run for the previous year or two. For instance, a man may start a business in a small provincial town, and by dint of great enterprise work up a good trade in a year or two which is *bonâ fide* as the books show it; but during the time the residents have become so well stocked with photographs that comparatively few more will be required by them for some time to come. The trade in the place has been exhausted for a period. To use a common phrase, "the orange has been sucked pretty dry" before it is parted with. Purchasers of such businesses have often lamented their bargains, though there was no misrepresentation whatever as to the amount of trade that had really been done.

In a photographic business individuality is a very important factor. In a sense a portrait photographer is somewhat analogous to a medical man. The latter may dispose of his practice, but it does not follow that the patients will be transferred with it, although the new man may be as able a practitioner as his predecessor. The same frequently happens in photography. The new comer may not be so well liked in the studio by the sitters as was the previous proprietor, or maybe a neighbouring artist may be liked better, yet his work may be, photographically, as good, or even better. Of course, that is a matter the vendor of the business cannot control. We have known in cases of this kind of allegations being made that there had been fraud and misrepresentation as to the returns, though, of course, they were groundless. We should not for a moment say that there has never been misrepresentation in the sale of a photographic business, because we know there often has been, as there has been in the case of most other businesses.

Here is another point to have in view when buying a photographic business. It is customary to bind the seller over not to carry on a similar business within a certain radius. That, of course, does not apply to any of the *employés*. If the studio has been much left in the hands of an operator, who is well liked by the sitters, and he leaves and starts in business for himself, or enters the service of another photographer in the neighbourhood, the business of the old concern is likely to suffer badly, particularly if the incomer is not of agreeable manners, or if he does not produce the same kind of work as was formerly turned out. There is always the possibility of this kind of thing happening when a business has been mainly conducted by *employés*. We have here made no estimate as to the value of photographic businesses, large or small, but merely call attention to a few points that purchasers would do well to give attention to, as by so doing they will often avoid after-disappointment.

Electric Light Peculiarities.—An instructive instance of the effect of the atmosphere acting on a turbid medium on light has recently been discussed. Photographers are unfortunately too familiar with the actinic-light filtering powers of fog upon sunlight, and the same effect upon the visual constituents of electric light seems to be produced by mists. It appears that since the loss of the *Drummond Castle* the attention of Government has been called to the fact that, since the use of the electric light in lighthouses, vessels have been lost in close proximity to these beacons, though possessed of some of the most powerful electric lights in the world. Close to Dungeness, Lizard Point, St. Catherine's Point, and now off Ushant, vessels have been wrecked, and the survivors have stated that the lights were invisible though but a slight distance away.

Astronomers' Troubles.—The discomfiture of the unfortunate photographer who discovers, on setting up his camera a long way from home, that it has been kept in a damp place and will not "fit," is well known and sufficiently real. It is in a similar direction paralleled by the mishaps recently chronicled by the Astronomer Royal for Scotland. Every one knows the important part played in astronomical work, whether visual or photographic, by the "driving clock," and this is where the trouble has happened. Sir Howard Grubb's two clocks work perfectly, but the one for the 15-inch equatorial, which, for stability and freedom from changes of temperature, has been built in a chamber in the middle of a mass of brickwork, further protected by slag-wool-lined doors, is in danger. This

central chamber turns out to be quite damp owing to the evaporation from the cement or mortar used in joining the bricks, &c. Meanwhile everything is being done to remedy matters, unslaked lime and anhydrous chloride of calcium being placed so as to absorb the moisture. It is anticipated that, when the mortar is quite dry, all will be well. Any one who knows anything about bricks and mortar would be sorry to state how many years would have to elapse before that consummation would be arrived at.

Prognosticating the Weather.—A correspondent writes in reference to our paragraph on this subject in last week's issue, asking if the theory of the spectroscopic forecasting of the weather has been altogether abandoned. He says, and we know it to be a fact, that the theory of the so-called "rain band" met with a considerable amount of opposition; but we believe, speaking from recollection as well as from our own personal experience, that the truth was, that whereas in a fairly clear atmosphere—as in the country—the rain band formed a tolerably, if not an absolutely, reliable forecast of rain, in the smoky atmosphere of town it is either altogether invisible, or may be caused by other influences than aqueous vapour. Our own experience with a little pocket spectroscope agrees with that of our correspondent, in that we have invariably found the appearance of the rain band—in the country, at least—to be followed by rain within a few hours. Indeed, on one occasion we brought down a vast amount of ridicule upon the rain band, as well as Professor Piazzi Smyth, when we discovered it in a blue and almost cloudless sky, and when the barometer gave not the least indication of any change from "set fair." But there was a violent downpour, accompanied by a thunderstorm, within an hour and a half.

Increasing the Rapidity of Röntgen Work.—We have already detailed some important discoveries bearing on this, and in last week's *Nature* another variation is described by Mr. T. G. Crump of Burnley. It consists in "placing the flame of a small spirit lamp in the angle formed by the Crookes' tube, the wire passing to the cathode and allowing a series of small sparks to pass to the flame from the wire."

But, at the Royal Society's meeting on June 11, Mr. A. A. C. Swinton brought forward a series of remarkable experiments he had been making upon the action of a magnet upon the cathode rays. He was enabled to focus the rays very sharply upon a point inside the tubes, but when so treated the external issuing rays were profoundly modified in character. The form of tube used was the earlier form of "focus tube," shaped like a pear. According to a note in *Nature*, with Mr. Swinton's signature, since these experiments were made, a further series have been carried out. He writes (*Nature*, vol. liv. p. 239):—

"With a tube of the form shown, exhausted to an extent that gave X rays plentifully under ordinary conditions, and supported over an electro-magnet, the X rays disappeared as soon as the magnet was excited, but reappeared the moment the magnet was demagnetised.

"With another tube of similar form, but furnished with an inclined platinum plate forming the anode placed near the bottom of the tube, similar results were obtained. This tube being kept on, the pump was further exhausted to a degree that allowed the electric discharge to pass with difficulty when the magnet was not excited, and under these conditions gave X rays of a character that penetrated the bones of the hand almost as easily as the flesh with but little contrast. With this exhaustion the excitation of the magnet not only caused the cathode rays to focus on the platinum, thus giving sharper shadows, but at the same time had precisely the same effect as lowering the vacuum, in so far as the moment the magnet was excited the X rays became more plentiful, and became of such a character as to penetrate the flesh with much greater ease than the bone, so that the contrast between bone and flesh was exceedingly marked. A photograph of the hand taken with one minute's exposure with the tube in this condition, and with the magnet excited, though considerably over-exposed, proved to be a very good one. Further investigations are in progress, but the application of a strong magnetic field in the manner described gives promise of having considerable practical utility, not only in so far as it facilitates the accurate focussing of the rays proceeding from a flat cathode upon any desired point of the platinum anode, but also, and more especially, because by employing a high exhaustion, and by varying the intensity of the magnetic field, it is possible at will to arrive with ease at the exact conditions requisite to produce a maximum of X rays of exactly the penetrative character that may be best for any given purpose, a result which hitherto has been difficult of attainment."

Iodine after Fixing.—We have repeatedly, in these columns, written down the practice of using hypo eliminators, that is to say, of using chemical means to decompose the hyposulphites remaining in negative or positive films after fixing. One of the substances formerly recommended for this purpose is iodine, which, however, we have on a former occasion shown, is calculated to leave quite as dangerous compounds behind it as the hyposulphites themselves. A very forcible proof of the truth of this has just been presented to us in an indirect manner. A correspondent writes that, in intensifying collodion emulsion negatives after fixing, he invariably gives a preliminary wash of weak iodine solution, which materially aids the process of intensification; but latterly he has been troubled at intervals with the appearance, at some stage of the operation, of a faint, though sometimes very marked, opalescence in the transparent parts of the plate, which looks as if it had not been thoroughly fixed. But neither hypo nor cyanide, nor, in fact, any treatment he has tried, will remove it, and before intensification has been completed the opalescence has been converted into a deep ruby stain.

After careful investigation, he has traced this evil to its source, which is, originally, imperfect fixation, possibly aggravated by insufficient washing. The films, consisting of bromide of silver, are fixed with hypo, and if the operation be not thoroughly performed, or if the washing be hurriedly done, there will remain a certain portion of soluble, and semi or insoluble, silver salts. If iodine be now applied, there will be a visible formation of iodide of silver; the iodide, being less soluble in hypo than the bromide, is precipitated, and, if the plate be now refixed in either hypo or, preferably, cyanide, not much damage will be done, provided a careful washing be given.

But, if the danger be not suspected, and intensification be proceeded with, the opalescence we have mentioned first appears, and this eventually increases into a deep and indelible stain. We cannot follow out the precise chemical changes that go on, but may repeat what we previously said, namely, that one of the results of the reaction of iodine and sodium hyposulphite, or thiosulphate, is the formation of sodium tetrathionate, and probably other of the thionates, and, if silver hyposulphite be present, there will, of course, be the corresponding silver salt. This, as the experience quoted shows, is, as we have before stated, at least as dangerous as the salt decomposed, and, controverts the opinion so frequently expressed that no eliminator is so safe as honest washing.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

Leeds Meeting, Monday.

The Eleventh Meeting of the Photographic Convention of the United Kingdom commenced on Monday last at Leeds in beautiful weather, which, if it should prove to have continued throughout the week, will go far towards making the Convention a memorable one. We have little doubt that, when the history of this Convention comes to be at leisure reviewed, the word "success" will be applied to it with as much readiness as it was to any of its predecessors.

Leeds is grimy, prosaic, and intensely matter of fact, but it is earnest, a valuable quality of which the members of the local photographic Society, who have taken in hand the work of organization, possess their full share. During the past few weeks much heavy

work has had to be gone through to ensure the programme being worked off smoothly, and the arrangements come to were well calculated to achieve that end. The Local Executive Committee consists of Messrs. John Henry Walker, Chairman; B. A. Burrell, F.I.C.; Peter Gilston, J.P. (Ex-Mayor), President Leeds Photographic Society: Washington Teasdale, F.R.A.S., &c.; Dr. Thomas Thresh, Ph.D., L.R.C.P.; W. J. Warren; H. F. Wigglesworth; Herbert Denison, F.R.P.S., Hon. Treasurer; and Godfrey Bingley, Hon. Secretary, Thorniehurst, Headingley, Leeds; and one and all of these gentlemen have applied themselves to the work of organization and arrangement in the most thoroughgoing manner.

Saturday and Sunday brought a number of arrivals from distant parts of the kingdom to the Convention headquarters, the Queen's Hotel. Mixed with the old faces that have been seen at all or most of the preceding Conventions were many new ones. Early on Monday a stream of arrivals appeared, and the Philosophical Hall, at which the meetings are to be held throughout the week, was crowded with members taking tickets for the week's excursions, exchanging greetings.

The meetings of the week, with the exception of the Reception, are being held in the rooms of the Philosophical Museum, which, in addition to a lecture theatre placed at the disposal of the members, allows of the use of three galleries for Exhibition purposes, as well as offices where Mr. Drage, Mr. Walker, Mr. Bingley, Mr. Dennison, and other members of the Local Committee conducted the business transactions of the Convention—no light task, especially as regards the clerical work attendant on the issue of tickets.

The Exhibition of Pictorial Photographs.

This Exhibition, which has been organized by the President, Mr. Robinson, is hung in the Library of the Museum—a well-lit apartment which is excellently adapted for the purpose. There are about 115 photographs, selected chiefly from those that have been hung at the Exhibitions of the Salon, with the addition of a few works that antedate that Institution, and one or two that are quite new. The hanging has been most ably done. The bookcases are covered with a dark purplish-brown cloth, which forms a good background. We were pleased to observe that very early in the day the Library received a good number of visitors, who manifested great interest in the photographs.

It would be easy for us to pick a just quarrel with Mr. Robinson for having given the display a too Salonic character; but, inasmuch as it is Convention week, and the display is really a good and beautiful one, we refrain. One thing, moreover, for which we think Mr. Robinson is entitled to the thanks of Leeds Conventioners and photographers generally is in having set his face against including in his display any of those preposterous eccentricities which have formed the amusing element in the Salon Exhibitions.

Among the exhibitors are Messrs. Arthur Burchett, J. Craig Annan, Shapoor N. Bhedwar, W. Crooke, Demachy, F. Hollyer, E. R. Ashton, Ralph W. Robinson, H. P. Robinson, F. M. Sutcliffe, H. E. Davis, Karl Greger, G. Davison, A. Horsley Hinton, B. Alfieri. Most of these gentlemen are represented by the works with which they have recently been prominently identified, and that have been referred to in these pages, and therefore a detailed reference to them is unnecessary, although, to give our readers at a distance an idea of the general appearance of the Exhibition, we may say that it includes several of Burchett's figure studies, Annan's portraits, Bhedwar's "naver" series, Crooke's portraits, Hollyer's portraits (one of a young lady with her head against a door knob is conspicuously not at Mr. Hollyer's best), Ashton's Eastern scenes, Mr. H. P. Robinson's land and seascapes (including *Storm Clearing Off*), Sutcliffe's *Water Rats*, Davison's *Onion Field*, Horsley Hinton's *Day's Awakening* and *Day's Decline*, &c.

The *Leeds Mercury* says of the Exhibition: "Any one interested in art should, under no circumstances, miss the opportunity thus afforded them of examining a very beautiful collection of work, produced by several of the most skilful photographers of the day. There is an agreeable surprise in store for those who are only acquainted with the style of picture ordinarily turned out by the knights of the Camera. The majority of the prints shown in the Exhibition are, in every sense of the word, works of art."

Our contemporary terms Mr. Davison the "Whistler of photography." Of Mr. Lionel Bennett's Thames study, *Inward Bound*, it remarks: "We should have imagined it too easy a matter to produce a foggy photograph to make it worth an artist's while to photograph a fog."

Exhibition of Apparatus and Photographs.

Besides apparatus, this section of the Exhibition includes a number of photographs by various processes. The display is spread over the entrance hall and two of the galleries, which are filled with geological and other specimens.

Taylor's Drug Company, Leeds.—This firm has a large case of hand and stand cameras, &c., placed in the entrance hall.

Watkinson & Co., Leeds.—The members of the Convention were invited by Messrs. Watkinson to visit their apparatus works, and many, no doubt, availed themselves of the privilege. The firm's display in the museum included two large cases, showing cameras in parts, finished cameras, light stands, and a variety of other items of apparatus, apparently of good quality and undeniably cheap.

Reynolds & Branson, Leeds.—The high reputation held by Messrs. Reynolds & Branson justified us in looking for an excellent exhibit from them, and we were not disappointed. A case of Ross and other lenses; a variety of extremely well-made cameras, including a fine photo-micrographic instrument; a well-filled chemical cabinet and specimens of apparatus for X ray work formed some of the firm's exhibits, the remainder of which were both good and interesting.

Percy Lund & Co., Bradford.—Specimens of printing in half-tone and colours were included in Messrs. Lund's exhibit.

The Aërograph Company, Memorial Hall, London, E.C.—Some very beautiful examples of the use to which the air brush may be put in the working up and finishing of enlargements are shown by the Aërograph Company. Examples in colour are also included. The quality of the results yielded by this method of distributing liquid colours convinces us that photography will continue to regard the Aërograph with great favour. The results are very popular with the public—especially that large section of the said public which is not yet educated up to "pictorial" photography.

R. & J. Beck, Cornhill, E.C.—The stand of this well-known house is devoted to specimens of the new 5×4 Frena, an ingenious little collapsible pocket and opera glass, a simple clip for attaching as a luggage carrier to cycles, the Bynoe printing frame, and other specialities. Mr. Bynoe was in charge at the time of our visit.

Pearson & Denham, Leeds.—Examples of cameras, stands, packages of dry plates, &c., adorned this firm's stall.

Wellington & Ward, Elstree.—The Elstree house contented themselves with sending two frames of prints in their Sylvio and platino-bromide papers. As examples of faultless technique these prints would be difficult to surpass.

Elliott & Son, Barnet.—A large bromide enlargement, measuring at a guess nine feet by four feet, and handsomely framed, is Messrs. Elliott's sole contribution to the Exhibition. It hangs in the lecture room. The negative, by Mr. James Bacon, is that of a lady, full length, and the enlargement forms a striking and effective adornment of the room, the quality of the work being exceedingly good throughout. The tone of the enlargement is a peculiarly rich black.

The Eastman Company, 115, Oxford-street, W.—The four well-known printing processes of this firm—nikko, bromide, solio, and platino-bromide—are illustrated in their exhibit, which includes about a dozen frames of subjects. The nikko pictures are particularly fine and rich, and make the popularity of this process not difficult to realise. Some well-chosen portraits, figure studies, views, and snap-shots are used for illustrating the capabilities of the Eastman printing processes, and the display is a thoroughly good and artistic one throughout.

We here take the opportunity of mentioning that the members of the Convention are indebted to the Leeds Photographic Society for handy maps of Leeds, York, and Bolton, which were presented to every one attending. These maps are found useful guides.

The Reception.

The formal opening of the Convention took place in the evening

at the City Art Gallery. This is an imposing building, containing galleries filled with a fine collection of ancient and modern paintings, and for such a function no better venue could have been selected. It will be remembered that last autumn the Leeds Corporation promoted a photographic and black-and-white exhibition, which was held in this building.

In the unavoidable absence of the Mayor (the Right Hon. W. L. Jackson, M.P.), the Deputy-Mayor (Mr. John Gordon) received the members of the Convention, to meet whom a very large number of local ladies and gentlemen were invited. The scene when the galleries were filled was a beautiful and animated one, and it was felt on all sides that the Convention had been highly honoured by the magnificence and appropriateness of the surroundings in which it had been received.

During the evening the band of the Eighth (King's Royal Irish) Hussars played a selection of music, and light refreshments were provided. The company numbered several hundreds. Among the photographic notabilities present we observed Mr. H. P. Robinson and Mrs. Robinson; Mr. A. Haddon, retiring President; Mr. C. H. Bothamley; Mr. George Mason; Mr. Andrew Pringle; Mr. John H. Walker, Chairman of the Local Committee; Mr. H. Dennison; Mr. Godfrey Bingley; Mr. and Mrs. F. P. Cembrano; Mr. Harold Baker; Mr. R. P. Drage; Mr. C. S. Baynton; Mr. H. Sturmey; Mr. F. A. Bridge; Mr. H. M. Dennis; Mr. J. Howson; Mr. W. Crooke; Mr. S. B. Webber; Mr. C. Phipps Lucas; Mr. F. W. Williams; Mr. M. J. Harding; Mr. J. Porritt; Mr. W. Barry; Mr. T. Fall; Mr. E. J. Wall; Mr. A. Horsley Hinton; Mr. and Mrs. Snowden Ward; Mr. Hubert J. Elliott; Mr. F. O. Bynoe; Mr. J. L. Lyell; Major Lyraght; Mr. A. C. Baldwin; Mr. J. Stuart, Glasgow; Mr. A. L. Henderson; Mr. and Mrs. Percy Lund; Mr. A. F. Mowll; Mr. F. W. Hindley; Mr. J. J. Briginshaw; Mr. D. J. O'Neill; Mr. A. Tate; Mrs. Stevenson; Mr. C. B. Keene; Mrs. Keene; Mr. C. Winter; Mr. E. R. Ashton; Mr. E. and Mrs. Woodward; Mr. W. W. Naunton; Mr. T. Scotton; Mr. W. J. Warren; Mr. Washington Teesdale; Mr. Thomas Bedding; and very many others.

After the guests had made the tour of the various galleries, they gathered in the large Central Court, the Mayor being supported by the past Presidents of the Convention,

Mr. John H. Walker introduced the past Presidents of the Convention and the President to the Deputy Mayor, and said that it gave him peculiar pleasure to do so inasmuch as at Shrewsbury he was the mouthpiece of the Leeds Society in inviting the Convention to meet in their town. He alluded to the Convention as consisting of good fellows, and, remarking upon the fact that photography entered largely into every-day life, invited the Deputy Mayor to welcome the Convention to Leeds.

The Deputy Mayor, having apologised for the absence of the Mayor (Mr. Jackson), who was detained in London by his Parliamentary duties, remarked that many years ago photography was not recognised as an art. That time had passed, and it now took its place among the arts. He was grateful for what retouching did in portraiture, and he only wished it could smooth the wrinkles out of our lives as well as out of our faces. He was delighted that Leeds had been recognised as a fitting place for the meeting of the Convention, and he bade the members a hearty welcome, and assured them of the sympathetic interest of the inhabitants of Leeds.

Mr. Haddon, having introduced Mr. Robinson to the meeting, the Presidential address was read by Mr. Bothamley.

PRESIDENT'S ADDRESS.

When, five years ago, I was nominated for this honourable position, I felt compelled to decline, knowing that I could not carry out the duties as they should be carried out, having a defect of voice which would not allow me to read my own address. The Convention was greatly the gainer. By retiring, I made room for one who is a born organizer of photographic matters, a powerful and ready speaker and writer, and a true artist. I have recently re-read Mr. Davison's address to you at Edinburgh, and was delighted with its power, eloquence, literary skill, and almost prophetic sense. Although only a few years ago, we were then not far from the revival of pictorial photography, and, putting on the "vinegar and brown paper" after the battle of the styles, we now feel we are nearing success, and perhaps peace, although there are still clouds on the horizon. I have used the term, "revival of pictorial photography," because I think we sometimes want reminding that photography did not begin with the bromo-gelatine process, as some suppose poetry originated with Rossetti and Swinburne, forgetting Homer and Shakespeare, and some other ancient rhymsters. But I am digressing early.

At our Shrewsbury meeting I was waylaid at every corner by amiable councilmen and even prospective presidents, who suppressed their own claims, and asked me to preside over you, therefore what could I do but succumb, demauding however, and obtaining, a dispensation for all shortcomings. And now I feel at once proud and humble—proud of being drawn for a brief period to take the head of this noble body of photographers, and very humble, indeed, when I consider my inability to occupy a situation which almost any one of you is capable of adorning.

What is Photography?

In a presidential address, delivered before a Society which meets but once only in the year, it may be expected that a full summary should be given of the progress of the subject which brings that association together. I have carefully thought this matter over, and have come to the conclusion that nothing of the kind is possible in our case, the principal difficulty being that nobody can say with any confidence what photography is. At a Camera Club conference, in the course of discussion, a member once asked, in the most artless and innocent manner, "What is photography, Mr. President?" There was a blank pause, as if something dreadful had happened. Some of the audience looked wise, others doubtful, but few could have replied offhand. The result is, that we have now the dictum of Captain Abney, the greatest photo-scientific authority, that photography is "painting by light." If we acted on this judgment, it would enable us to clear off a crowd of encumbrances that have been crushing legitimate photography of late years, and obstructing our true subject. It seems clear to me, for instance, that, looking at our art as a business, the many subsidiary inventions we so eagerly welcome are taking photography out of the hands of photographers, and placing it in the hands of other trades. Take what is now the chief of these parasites, that which is called "process," what has that to do with photography? It is a printing and engraving business that gets all it can out of photography. It is the cuckoo in the hedge-sparrow's nest that is quickly elbowing the genuine bird out of its own cradle. The promoters of "process" have much to answer for to the photographer.

Then, again, how am I to enumerate all the progress that science—the genuine science of photography—has made during the year? How winnow out the false, and leave the true? And what is the use of saying anything this year about what may be altered by the next, for the science of photography is a paradox? Science is said to be the art of facts, or certain knowledge. Everything is proved as we proceed, but in the science of photography we soon find, with Macbeth, that "nothing is but what is not." There seems to be nothing more unstable than fact, and a photographic society appears to be but a branch of the College of Laputa.

But, if much that is called photography has no right to the name, there is not anything—neither the oldest nor the youngest of the arts and sciences—that is not indebted to our art. The most sublime of the sciences—astronomy—owes to the art which takes the portrait of the humblest child in the automatic machine in the streets, its greatest triumphs.

The "New Photography."

It is curious how everything claims affinity with photography. There must be something worth claiming in the word. A method of showing your naked living bones by aid of the dark rays of a Crookes' tube has not only been called photography (or light painting, where there is no light), but those who have been spending their time with it have gone to the preposterous length of calling it "the New Photography." Now, this is not only ignorance, but rank piracy. The term, "the New Photography," has been used so much in connexion with the forward movement in pictorial photography that the pictorial photographers ought to have acquired a copyright in the title. Any fine morning in October, the traveller in Piccadilly may observe twelve or twenty sandwichmen bearing aloft the banner of "the New Photography," in connexion with the Photographic Salon. It is a wonderful discovery; but is it photography, especially the New Photography?

Last year I think I gave a sort of informal promise that I would not touch on art in this address, but would confine my remarks to abstract, if not occult, science. This, I think, was made at

gathering of sometimes misunderstood science, welcomed throughout the world as the A.M.S.; but, on reconsideration, I cannot help supposing that it will be expected that I say a few words on the branch of photography to which I pay most attention.

Advances in Pictorial Photography.

I think it must be admitted that pictorial photography has made great advances the last three or four years. The initiation of the Salon was the outward expression of what has become nothing less than a revolution in pictorial photography. The Salon was not an accident. It was thought over and discussed for some years before it was attempted. It was received with derision, and the usual endearments which try the quality of every new thing that is worth trying; it not only withstood the onslaught, but it converted all opponents worth converting, and made them into very good friends; and the Salon is now an institution that, I believe, no true photographer would willingly let die. And what is the theory of the Salon? The main intention of its promoters was to keep pictorial photography (which was in some danger of extinction) pure, and to itself, and to lead it out of the groove in which it was withering. It was a struggle for liberty, for freedom from conventionality, for individuality. The object was to look to the end, to make a good picture without being dragged away by side issues; to treat the materials as our tools, and not the main or sole consideration; to be content with a negative when it was adequate, without measuring its density, or trying to prove that, if another similar plate were exposed under the same conditions, the photographer had no power of making other than a facsimile of the first; feeling and expression in the print were to be more valued than the bloom on the film; that how a picture was made was a matter between itself and its maker, which could not be described in a formula; and, in short, that there should be a great deal more of the mind of the man than evidence of his camera. Under these auspices, landscape has become from being an unemotional transcript of a view a sympathetic interpretation of dominant characteristics, and portraiture raised to a dignity to which it has not hitherto aspired.

There is this difference between many of the pictures in the exhibitions under the old *régime* and the new. In the old, the photographer seems to have selected the view, and the camera did the rest, whether the photographer liked it or not; in the new, if there is any evidence that a camera was used, it was only as a tool under control. If one or two exhibitors, in their zeal for originality, have overstepped the borders of the sublime, with the usual unfortunate consequences, who shall blame them? I hold that not one of their apparent failures has been wasted; there has been more use in some of the much laughed-at lunacies than in acres of what, for want of a better phrase, we may call "the usual thing." It was soon found that those who came to laugh remained to praise. The eccentricity of yesterday, if it has not become the commonplace of to-day, has evolved from a thing to be laughed at to be something to think over.

The work of the extremist is done, and it is now left to the more moderate to show, as it has never been shown before, that even a photograph, as Zola says of other works of art, is "a piece of nature seen through the medium of a temperament."

Wanted—A Revolution in Professional Portraiture.

The subject of pictorial photography is one on which I easily become enthusiastic; but I have introduced it here with a definite practical purpose, as well as because I thought you would expect it.

Some of you are professional photographers, and I am told that the business is not now so good—with those particularly who never attend this Convention—as it used to be in former times. Now, my firm opinion is that there wants some such revolution in the portrait profession as has taken place in the opinions and practice of those whose chief aim is pictorial photography. The way to that desirable goal is through harder study of art, on entirely different lines from what is usual, and the greater confidence which knowledge brings.

We make no attempt at originality or individuality. Let the thought I am about to state take hold of you and awaken your consciences. This very day, bad as the times are, the professional photographers of England have taken many thousands of portraits. These "counterfeit presentments," with very rare exceptions, are all manufactured to the same conventional pattern, with very little variation, since—let us say—the cabinet portrait was introduced. Do you wonder at the public getting tired, even of beautiful mauve albumenised paper and billiard ball retouching, the stolidity of the stiff pose, or the strain in the pictures of those who attempt "a grace beyond the reach of art?" Are you surprised that the public rush for the quiet simplicity of those portraits which appear almost too simple to be art, but which are all art, that have been shown you in the Salon? With regard to the public, I met with a curious illustrative example only the other day. A month ago I was one of between two and three hundred guests at a double wedding. The previous day I had an opportunity of suggesting that a professional photographer should be engaged, and was crushed by the reply, "We are tired of highly polished professional photography," and thus what I know would have been a very large order was lost.

I am, perhaps, becoming too dictatorial, and really feel I must apologise; but to me the decline or stagnation of photography is like the illness of a personal friend—I cannot stand by and see it die without an effort, however ineffectual.

Now, as I have indicated, what we want in professional photography is some such revolution as we have had in the pictorial division. I am much among photographers, and find that, when a man gets out of the old groove, it shows that the thought he is using is his own, and not his neighbour's; if he has any skill on the pictorial side, he succeeds. I also notice that no man will care how low his neighbours drive their low-class trade, so that for whatever he charges he gives money's worth in quality. It may interest some photographers to know that there are often sold at the Salon, and the purchasers value them as treasures, simple untouched prints, at from two to five guineas each—not according to size or weight—which the ordinary photographer would value at less than half-a-crown a square foot. They are not even on mauve albumenised paper, and possibly not retouched, yet it is thought that quality accounts for the price.

A Plea for Specialism.

In connexion with portraiture, there should be plenty of room in large towns for specialism. I only recollect two specialists, but they did well—Adam Salomon and Camille Silvy. The latter was the first in time; the only kind of photograph he produced was the *carte-de-visite*. He also confined himself to one quantity and one price (forty copies for two guineas), and, when he had taken forty sitters in the day, nothing could induce him to take another. His carriage was in waiting every afternoon to carry him away from the importunity of his would-be clients. Surely this was good business, not beneath the attention of the modern photographer. Adam Salomon was the other specialist I have known, he produced one kind of picture only; it measured 10½in. by 8½in., and was covered with a piece of glass, but not framed. His price for the first copy was one hundred francs, or 4*l.*, and it was worth it. Another praiseworthy characteristic of Salomon was that he selected his sitters. If he judged a sitter unworthy of his camera, he declined to photograph him.

Photography has given a Loftier Tone to Art.

Much as his work wants improving, the portrait photographer has done a worthy work in the world. I could appeal to your feelings as to the aid his work has been to family affection and the domestic relations, but this has become rather trite. I can, however, point out a fact that I don't think has had the attention it deserves.

There are not many painters, perhaps, who are prepared to acknowledge the fact that photography has not only improved their drawing, and light and shade, but also their taste, and the taste of the world. We no longer see any very great absurdity in a painting—None of the old background horrors, for instance. But I mean deliberately to go a great deal further, and I believe I am perfectly sane when I say that photography has given a loftier tone to art altogether. I feel that this statement requires to be illustrated, if not mathematically proved. Years ago, before the beneficent influence of photography, everybody who could draw a line claimed to be an artist, and his claim was allowed. If he claimed to be a professional, he looked down with contempt on the most accomplished amateur. Photography is more particular, and has taught us to look for other qualities besides the mere use of the pencil, the brush, the chisel, or the camera. A man is no longer an artist because he can make a picture, any more than the writer of doggerel is a poet.

I am afraid I have used up my time, and shall weary you, but there is one other subject to which I must allude, and I hope I shall not be misunderstood.

A Word for Pure Photography.

The Council of the Convention has decided to spend its surplus money in the endowment or encouragement of research. I am not sure that I ever heard of any good ever having occurred from small money grants for scientific research, but it is possible, and I shall look for the practical results in this case with great interest. In the mean time, I should like to see research made for all the dead and gone and useless inventions that have clogged and hampered photography, that they may be utterly destroyed out of the memory

of the most rabid experimentalists—those who have been smothered for years—and allow them to breathe once more the fine air of pure photography. After more than fifty years, we want a spring cleaning.

I should also like to see a commission appointed to inquire into that great question to which I have already referred—"What is photography?"—that we may know where we are. At present, many of us seem to be following other arts and sciences, using photography as an excuse, the professionals going into other trades, but not bettering themselves; the amateurs, on the excuse of the lantern, going into voyages and travels, and other alien subjects. In fact, we have given ourselves away. We have made ourselves too cheap. The prosperous times of photography were when we were more nearly pure photographers.

This was thirty years ago, when hundreds of us lived where, metaphorically speaking I hope, thousands now starve. We are all apt to rejoice whenever some invention makes another opening for our wonderful art, or our art makes possible another business. But where does this generally land us? To take one case. Who makes our local views? German printers; or, if they are made in England, it is in a manufactory by a firm. I remember when nearly every professional photographer derived some income from the sale of views of his town. There was another difference. In those days a photographic view sold freely for a few shillings, and was valued by its purchaser; now a copper is the splendid remuneration for a splendid German print! They are no longer the personal productions of the photographer, but are hawked from town to town by the carpet-bagger, and we get process prints of all round the world for sixpence, if we can only get a coupon permitting the purchase from the local newspaper office.

No Difference Between Amateurs and Professionals.

But what am I doing?

I am recognising that there is such a thing as professional photography. On an occasion like this, and, indeed, on all other occasions, I would prefer not to note any difference between professionals and amateurs. I have belonged to both, and find the amateur by far the most exacting position. My experience is that when you are a professional, you attend to your own business, and when an amateur you look after that of everybody else. Let us all be known as photographers—those, I mean, who practise photography—and brothers in the art we all love.

But, whether professional or amateur, let me, in concluding this inadequate address, wish you, in work or play, increased success, and, in the watchword of this Convention, to "cheer up."

At the conclusion of the address, the usual votes of thanks were passed and acknowledged.

The Reception passed off with great *éclat*, and will long be remembered by those who were present for its brilliant success. The evening concluded with an exhibition of lantern slides, illustrating the Shrewsbury Convention and Bolton Abbey.

Tuesday.

Compared with the corresponding period of previous years, the Leeds Convention is numerically ahead of all its predecessors, more members having joined, so far, than on former occasions. Doubtless, when the total comes to be made up at the close of the week, it will be found that this superiority has been maintained throughout.

The National Association of Professional Photographers was instrumental in drawing many of its members to the Convention; and it is to be hoped that the professional element will continue to expand at these gatherings. The opportunity for the interchange of ideas and comparison of experiences should prove an incentive to photographers to support the Convention, and be present at its meetings.

The weather throughout the day was bright and pleasant, and about 120 members undertook the excursion to Bolton Woods and Abbey. The charming well-wooded grounds, the river, and the ruins of the old Augustinian Abbey supplied plenty of opportunities for photography, about 1000 exposures being made. An excellent luncheon at the Devonshire Arms Hotel wound up an enjoyable day, and the party returned to Leeds well pleased with the outing.

The programme for the evening included the reading of a paper by Mr. A. Haddon on the *Fixing and Washing of Paper Prints*—this will appear in our next—followed by a display of lantern slides illustrative of Kirkstall and York. In the discussion that followed,

Mr. B. A. Burrell said that he had heard Mr. Haddon's paper with great pleasure. Anything that he said on the subject was worthy to be taken with respect.

Mr. S. B. Webber inquired which was the most efficient way of applying the water in the washing of the prints.

Mr. C. H. Bothamley remarked that it was an extremely useful thing to have presented to the Convention a summary of the four pages that Messrs. Haddon and Grundy had read on the subject of the fixing and washing of prints. Some complete nonsense was to be found in photographic literature as to the time solutions got in and out of a film. Some solutions diffused in and out at very great rapidity, as an example of which he cited the fixation of gelatine negatives. In reference to the information Mr. Haddon gave as to the amount of silver left in a print after it was fixed and before it was washed, Mr. Bothamley observed that this depended upon the total volume of fixing solution, and the strength of the solution. Taking ten ounces of hypo solution to fix a certain number of prints, and twenty ounces for a similar number, there would be half as much silver left in one print as in the other, but just the same amount of hypo. This was an example of the complexity of the question. He believed in short, over long washing. It was a fatal thing, too, to allow prints to stick together in washing, as this prevented the elimination of a solution from the film. He took exception to the theory that the chief cause of the fading of prints is the hypo left in them.

Mr. Andrew Pringle remarked upon the necessity of our prints being permanent, condemned hypo eliminators and long washing Nothing had been done to approach the work of Messrs. Haddon & Grundy in removing such mischievous ideas. As to how the fixation of a print ought to be done, his own opinion was that, if the solution of hypo is sufficiently strong, and of the proper temperature, and not acid, fixing would take place in a very reasonable time. He was shy of fixers containing free acid. The presence of acidified sulphite gave clear negatives, and obviated the use of alum, but this was the only gain. As to washing the hypo out, he pointed out that hypo was extremely solvent, and only wanted the access of water to complete solubility. He recommended the use of a rose tap for non-professional use, and believed that washing in water often changed would thoroughly remove hypo from the print.

A member believed that the introduction of acetate of soda in the toning bath had paved the way to the fading of albumen prints. He used to wash every print with a sponge on a glass plate, and gave half an hour's washing. He had thirty-year-old prints, toned with alkaline gold, that showed no signs of fading.

Mr. J. Stuart (Glasgow) agreed with Mr. Haddon as to the sufficiency of short washing. He had always been puzzled as to the compound left by insufficient washing, and believed it was a silver compound. Years ago, when using the borax bath, his prints were covered with little white spots; other photographs had the same complaint, and in every case the borax bath was used. His own belief was that the nitrate of silver left in the paper should be converted into chloride, and he therefore always treated them with a salt bath before toning. He was not in the position of never having faded prints, but he quoted an instance of prints made in 1861 and 1862 on evil-smelling paper that had not faded.

Dr. Thresh had taken advantage of the specific gravity of different solutions of hypo to ensure complete fixation, and believed that the lower specific gravity of a hypo bath used after one of a higher strength had ensured complete fixation. Washing prints by the dialytic method had eliminated all that could be got out in ten to fifteen minutes. If a sulphur compound was left in a print, he did not see why it should not be regarded as permanent, in support of which he quoted experiments made on sulphur-toned prints to test their permanency.

Mr. Haddon, in the course of his reply, recommended running water for the washing of prints, the latter to be separated. He agreed with Mr. Bothamley that hypo was probably not the cause of fading, but rather silver left in the high lights. He doubted the utility of Dr. Thresh's method of using solutions of hypo of different strengths, and concluded by remarking that he shortly hoped to give a paper on the influence of the strength of hypo used.

In moving a vote of thanks to Mr. Haddon for his paper, which was cordially passed, the President observed that that paper was a

very valuable one. The only perfect albumen prints he knew of had been washed in a pie dish for half an hour; but, in those days, pure albumen and pure paper were used.

The National Association of Professional Photographers, many members of which body were present at the Convention, also held a meeting in the evening.

Wednesday.

The General Meeting and the meeting of the General Committee were held in the Philosophical Hall. It was decided that next year's Convention shall be held at Great Yarmouth.

After the meeting, a group of the assembled members was taken at the Yorkshire College by Mr. Donald McIver, of Bond-street, Leeds.

Thursday's excursion was to York, and Mr. C. H. Bothamley read a paper on *Orthochromatic Photography*. To-day (Friday) Ripon, Studley Royal, and Fountains Abbey are to be visited, a Council meeting being held in the evening. The Convention meeting concludes with a visit to Knaresborough, Harrogate, &c.

OUTSIDE STUDIO WORK.—III.

Among the numerous outside commissions a photographer is asked to undertake, there are none perhaps requiring more skill and patience than the photographing of animals, and a by no means uncommon example of such work is found when dealing with horses, the owners of which, having very crude ideas of photography, often request the photographer to take such animals going at their fastest possible speed, either in trotting or galloping, as the case may be, for in these days of instantaneous photography it is considered an easy thing for a photographer to take a horse going at full gallop, when trains travelling at the rate of sixty miles an hour are photographed; and who has not heard of the marvellous results achieved by Muybridge and others, of which many people have read but evidently never seen examples?

There is no doubt much misconception exists on the part of the public generally as to the limits of photography when dealing with subjects in rapid motion, and even numbers of photographers could be found who have but a poor idea of the difficulty, if indeed not impossibility, of photographing a horse going at full gallop, provided anything like a reasonable size of image is to be the result.

As to the productions of Muybridge, these, no doubt, served the purpose for which they were intended, viz., to depict the various motions a horse developed in the act of galloping, but it is going too far to call such results pictures, for they were merely silouhettes, and such results would certainly not be accepted as satisfactory photographs by the owners of horses generally, who look for the results showing the utmost amount of definition possible.

Others, again, point to horses jumping over hurdles, and say, Look at that, how easily that is done. Yes; but there is a wide difference between a horse taken at the moment of jumping a hurdle and when the same is distended at full gallop shortly before rising to the leap; and, if any one doubts this assertion, let him proceed to test the question by exposing a plate on both situations, when he will get his eyes opened, no doubt.

The fact, is that to obtain a fully exposed image of moderate dimensions, say, even up to five inches in extent, of a horse going at full gallop, in such a position as will show the animal's four legs and his tail cut clean and sharp with a fair amount of definition and detail in the eyes and other portions of the body, is a feat but seldom achieved, and no one knows the difficulty better than those photographers who are in the habit of making a special study of animal photography, any one of whom, on being asked to undertake such a commission, will think twice before guaranteeing to do so with any hope of success, and any workers who have never had a try at such a job should be careful before undertaking such a difficult feat.

I know quite well fast shutters can be made to do a good deal in conjunction with fast plates, but I am not now referring to small-sized toy images, such as are taken by quarter-plate cameras. I am speaking as to the production of images direct of a fair amount of size, say, on plates up to whole-plate dimensions. Others, again, know the secret of so placing the camera as to take a rapidly moving object from such a standpoint as will almost blind off any appearance of rapid motion, such as the taking of a train or a bicycle, end on, and, no doubt, this dodge holds good to a certain extent when dealing with horses; but such results never satisfy an owner who require the action of his animals shown. It is this dash or action that is so much desired, and it is this dash or action that is so difficult, if indeed not impossible, to obtain. At least, if there are examples of such, I have never seen them, of any considerable extent as to size, when taken from such a standpoint as will depict the horse's four legs and tail with all the rest of the image well defined as to detail.

Sometimes one meets with very clever photographers who know a great deal and who have done this sort of thing often, but, on being asked to do it again, or even to show any of their boasted productions, they slink into obscurity.

I am not writing of such images as silouhettes or of very small images taken with short-focus lenses at a fairly long distance, I am referring to a direct picture of sufficient size to form a half-plate or whole-plate photograph when mounted.

There are, however, examples of a less exacting kind which, although somewhat difficult of execution, are not by any means verging on the impossible, in this class of subjects we have trotting horses or horses moving rapidly in vehicles.

In undertaking work of this kind, where the image is required of even a moderately fair size, the best of light, quick plates, and a shutter set for a high rate of speed are all necessary. Practice beforehand on a similar subject is also beneficial, because it enables an operator to learn exactly the proper amount of tension to set upon his shutter; if the shutter is driven too rapidly, loss of definition or detail will follow; if too slow, of course movement in the image is the necessary consequence.

A few trials at a well-selected standpoint are of great assistance, it not only enables the exact speed of the shutter to be ascertained, but it also helps the driver to do his part of the operation properly, for a good deal more depends upon the driver than many imagine, working at such close distance the sharpness of the image is very liable to suffer if the horse and vehicle are not led exactly over the chosen spot focussed upon.

To give anything like an idea of the speed a shutter should be worked at for such a subject as a trotting horse is in my opinion quite useless, the only way to arrive at such is to practise well beforehand.

I believe a great deal of misconception exists regarding the speed at which it is claimed some shutters work, and I know also that shutters are driven frequently far faster than there is any need for in instantaneous work. The movement or blurring perceptible in a negative of a moving object taken with a fast-working shutter is often caused by the vibration of the shutter, and not by the want of speed at which the shutter was working; with some shutters, to obtain high rates of speed, increased tension in the springs is required, and this, of course, means a firmer grip on the release clip, with the necessity for a consequently greater power or pressure to release the same. In nine cases out of ten, this extra pressure required to release the grip of the shutter causes a distinct kick or vibration at the most critical time in its use, just at the moment of exposure (I'm not speaking now of toy apparatus), but of such as are required for fairly large commercial working, and this is a fatal fault in all shutters which are liable to it. Many years ago I realised the importance of this, and discarded the use of several shutters in which this preparatory kick was apparent at the moment just prior to exposure.

I set about therefore to design and make a shutter that was free from such defects, and, although the one I use is quite a home-made article, made out of a common cigar box in fact, I have yet to see another that is better for any very fast work, or that will yield a better illumination of the foreground. Sometimes I smile when I am out working at the astonishment depicted on the faces of amateur workers, who evidently consider my flaps quite an antediluvian production, when compared with some of the modern highly polished articles but I know the value of a good shutter, and, although the one I use resembles old Toole in one of his inimitable characters, when he says, "You will find me a rum un to look at but a good un to go," I prefer it for several reasons to any I have hitherto seen, one of these reasons being that I have two release movements attached to it, whereby I can use it either right or left in accordance to the direction the object is travelling; by this means, should there be any kicking, the same follows the direction of the object, and tends to prevent any signs of movement of the object in the negative; there is more in working a shutter after this manner of dodging or chasing than many imagine when very high pressure is being used for fast speeds.

A close scrutiny of a negative in which there is blurring or movement of a moving object will often reveal the fact that such blurring is caused by an up-and-down motion, even in cases where the object has been travelling *across* the plate; this defect is clearly attributed to the kick of the shutter, and, as I have said, in nine cases out of ten is caused by the pressure on the release clip being too great.

T. N. Armstrong.

IMPRESSIONISM AND REALISM: THEIR SCOPE AND LIMITS IN PHOTOGRAPHY.

Six years ago an attempt was made by Dr. Emerson to show that what he called the naturalistic school of painters was the only true school of art, and that photography, being closely related to such a style of painting, was thereby raised not merely to the position of an art, but to the full dignity of a fine art. This contention caused a storm in a teacup. Discussions arose in every direction on the relation of photography to art, its limitations, and how far it was capable of rendering a naturalistic or impressionistic view of nature, Dr. Emerson and his followers asserting that photography is an art in the highest degree, capable of revealing in works the mind and personality of the artist, and by certain modifications able to yield effects even to the extreme of impressionism. Their opponents, of course, took up the opposite position to this, denying art in any form to photography, degrading it to the merely mechanical, arguing that the artist could not impress his mind upon such material, and that it was a purely imitative process, its only merit being the exact reproduction of minute and intricate detail which had no claim to the title of art. The theory started by Dr. Emerson he has since renounced, withdrawing from circulation his book on *Naturalistic Photography* in which it was put forth. He now denies art to the products of the camera, excepting in a very narrow sense. This conflict between the two sides continued for several years. The naturalists exhibited in various galleries some of their pictures, in which they embodied the principles of art they believed and taught. So marked was the individuality of their works that they became a class apart from the orthodox photographers, this fact alone showing that in some particular or method of working they departed from accepted canons, and proving their contention that personality can find expression even in a photograph. Lately, however, the vigour of this controversy has somewhat abated, breaking out only in an occasional article in the journals from some extremist on one side or the other. Now that the heat of the conflict has passed away, time having been given for ideas to mature, to settle in the mind, and for new thoughts to adjust themselves to the old, it would not be without interest to endeavour to draw from the controversy its lessons, if any, and try to discover the exact position in which it has left photography. To determine if it has had any material effect on the artistic development of photography, if it has modified the opinion generally held respecting its artistic merits, has strengthened or weakened its claims to be looked upon as one of the fine arts.

Impressionism.

It will be well to obtain at the beginning a clear and distinct idea of what is meant by such terms as "naturalism," "impressionism," "realism." This is not so easy as would at first appear, the terms used in art not admitting of that exact definition which is possible to science, the real significance of a word being often missed when defined too closely. However, I shall attempt it by giving, first, the definitions of men who speak with some title to be seriously considered by photographers; and, secondly, by reference to paintings and photographs in which the different methods are displayed, the latter means being at once the most delightful and instructive.

In general, the naturalistic and impressionist school are regarded as one and the same, and so Dr. Emerson in his first book classes them together. He observes:—

"But, as we have said, we regard the terms 'impressionism' and 'naturalism' as fundamentally synonymous, although we think the work of the so-called modern 'impressionists' but a passing craze."

In his latter writings Dr. Emerson cancels this opinion, and distinguishes very sharply between naturalism and impressionism. Thus:—

"Naturalism—the more or less correct reflection of nature, wherein truth of sentiment, illusion of truth (so far as possible), and decoration are of first importance."

"Impressionism, which is a purely personal vision of nature, as thus: An impressionist may paint sharply, or may paint colours wrongly from defect of vision, as does Monet."

Naturalism thus becomes a mere reflection of nature, whilst impressionism is a vision, an impression seen through the mind of the individual. For our purpose we will leave this refinement on one side, its evident purpose being to exclude photography from art, and return to Dr. Emerson's first work, where, regarding naturalism to include impressionism, he defines it thus:—

"Naturalism. By this term we mean the true and natural expression of the impression of nature by an art;" or, again,

"This, then, is what we understand by naturalism, that all suggestions should come from nature, and all techniques should be employed to give as true an expression of nature as possible." And he adds: "We prefer the term 'naturalism,' because in the latter the work can always be referred to a standard—nature."

According to these quotations impressionism means unfailing fidelity to nature; no very new claim as the standard of a school of painters; in fact, many in the past, and not a few in the present, uphold the same ideal. Schools have differed, not in their aim, but in their interpretation of nature. What is a true expression of nature? This is the real question. Thomas Bedding, however, denies the impressionists the right to this claim, and he sums them up in no measured terms as follows:—

"On the whole, from the foregoing illustrations, it may be deduced that impressionism cares nothing for truth; that it follows the imagination wherever it turns; that it seeks to know no amenability to intellectual discipline; that it is, in fact, the expression of unbridled licence, an eager yearning after the new, the strange, the grotesque—after anything or everything which has in its composition something in the nature of a revolt against generally accepted forms and ideals."

This is a strong condemnation, denying what Dr. Emerson especially claimed for impressionism, its truth to nature. H. P. Robinson, on the other hand, freely admits the fidelity to nature, but questions the possibility of including the whole of art within such bounds. He says: "There are those who look upon art as consisting entirely of a truthful representation of nature, modified by the moods and caprices of the artist, and believe that it is a matter very greatly of tones and colours, and that, above all, it should not teach or tell a story, or be in any other way interesting than as being an expression of the impression of the effect of a scene on the eye of the artist at the first glance. This particular sect is small in number, but loud in assertion, and protests that all art is worthless which does not use nature in a particular manner, according to a peculiar optical theory of its own. These sectarians have dubbed themselves 'naturalistics,' as though they absorbed into themselves all nature; but an examination of their works and doctrine will show that their claims as nature-worshippers extends to a very small part of the universal mother."

The foregoing should be carefully considered, coming, as it does, from a man who has done more than any other to demonstrate the powers of photography as a fine art. The final paragraph, as I shall try to show later, is a true estimate of the impressionist. The last definitions I shall give are from George Davison, a follower of Dr. Emerson, who upheld the principles of impressionism against the Doctor when he made his famous renunciation of naturalism and all its works.

Davison says: "In art the same influence is discovered in the revolt against conventionalism, and in the scholarly practice of those painters who have been variously called impressionists, naturalistics, and the like. It was such a return to nature, such a close observation of natural appearance under the influence of the materialistic tendency of the age, that led to the growth and practice of the body of painters known as impressionists. A more judicious section—those who seek a natural and scientific basis for their practice—has preferred, as far as such tenets permit any crystallisations, to style itself 'the Naturalistic School.' Finally, truth to nature is the first article of their faith, and the truest that science teaches concerning light and colour, and the manner in which the eye sees is made a guiding principle."

From these various statements of the meaning of impressionism it may be gathered that the impressionist strives hard to give an exact representation of nature. He makes the sensation caused by a scene upon the eye at a first glance the guiding principle, and disregards all the conventions or rules of art that have been practised by previous artists. More than this we are not justified in extracting from these writers' definitions. By such statements they have missed the true inwardness and meaning of impressionism, and added that which is not essential. The first point is in no way the special mark of impressionism, and the second has been previously discussed by artists. Burnet dismissed the doctrine as neither nature nor art. Hence, if impressionism means no more than these definitions imply, it contains no principle which separates it from other schools, unless it be the negation of all previous rules of art. But we see in its results a marked positive quality, and for this effect there must exist some adequate cause. This cause, and the real meaning of impressionism, the more easily to show its bearings on photography, I will proceed to unfold. For this purpose we will follow the second method of illustrating from pictures, taking as examples two paintings of the naturalistic school in public galleries that all may study. The one, mentioned favourably by Dr. Emerson is at South Kensington, *Carnation Lily; Lily Rose*, by Sargent, at present hanging in a badly lighted corner, and very difficult to study. The other is in the National Gallery, *The Harbour of Refuge*, by F. Walker, a painter commended by Dr. Emerson in his naturalistic days.

Things may be pictorially reproduced under several aspects, as colour, form, light and shade, and likewise as stationary or in motion, meaning by motion a change of light, as a sunrise or a sunset, the movement of bodies, the vitality of plants, the activity of animals, and the life and mind of man. This phase of motion is not generally brought forward in connexion with art, for reasons to be given later. The predominance of one or the other of these several aspects in a work of art will determine the character and position of a painter. Thus, the pre-Raphaelites are an example of a school of artists who painted chiefly the colours of bodies, subjecting all in their pictures to the scheme of colour. Ruskin says of Rossetti, that he could conceive in colour only. The Dutch painters were also largely dominated by colour, form took a very important place, and they excelled in the subtle rendering of light and shade, yet they lack something. In Rembrandt colour and form are feeble, but in their place we have a masterly management of light and shade.

Coming now to motion, there was no European school who could be said to represent the domination of motion in their works, until the birth of the modern impressionist, and they, I maintain, subordinate all in their pictures the better to suggest the idea of motion. There exists, however, a non-European school of painters who have attained to perfection in their skill of representing motion, and that is the Japanese. It was, no doubt, largely from the study of Japanese art that the modern French impressionists gained their ideas. Many of the Japanese studies of birds and flowers, meagre as they often are in detail and wanting in colour, have more of real life in them than any of the carefully painted Dutch flowers and fruit, with their faithfully represented flies and drops of dew. Motion is the something missing from Dutch art. They were content to paint dead birds, the Japanese strive to paint them living. This effort to suggest motion with another characteristic, to be discussed below, springing from their revolt against conventionalism, separates the impressionists from any school which has preceded them. The orthodox painter follows the teaching of Lessing, that objects in motion cannot be represented by painting; or, in his own words, "the painter can only create a presumption of motion; in reality, however, his figures are without motion." This is true when comparing the power of suggesting motion possible to painting and poetry respectively; but, when considered alone, painting can, and does, represent motion in a large degree, mainly by suggestion to the imagination, and likewise by deceiving the eye.

Now, the impressionist claims to represent bodies as they strike the eye of an observer at a first glance. The first notion of sight to engage the mind is not colour, form, light and shade, but the motion of bodies. Hence the impressionist is constantly striving to give this idea full expression, and neglecting colour, form, and light and shade. To support this contention that motion is the primary effect on the mind in sight, I will recall the well-known case of the boy who was born blind, and, by an operation in after-years, received his sight. When asked what was his first impression on opening his eyes, he replied, "The things jumped up and struck me." A passage from Addison will also show this attractiveness of motion, a passage interesting to photographers, as it gives a beautiful description of a picture formed by the camera obscura: "The prettiest landscape I ever saw was one drawn on the walls of a dark room, which stood opposite on one side to a navigable river, and on the other to a park. The experiment is very common in optics. Here you might discover the waves and fluctuations of the water in strong and proper colours, with the picture of a ship entering at one end, and sailing by degrees through the whole piece. On another there appeared the green shadows of trees, waving to and fro with the wind, and herds of deer among them in miniature, leaping about upon the wall. I must confess the novelty of such a sight may be one occasion of its pleasantness to the imagination, but certainly the chief reason is its near resemblance to nature, as it does not only, like other pictures, give the colour and figure, but the motions of the things it represents."

Motion or life, then, is what the impressionist is trying to represent on his canvas, and he subordinates to this aim colour, form, and, in a less degree, light and shade. This can be still further shown by considering in what manner, and how far, the impressionist is successful in reproducing inanimate bodies, say, a vase. Compared with the Dutch painters, he totally fails to give a complete or adequate impression of the vase to the eye or mind of the observer. The impressionist creates nothing but a vague and confused idea of such an object, and he turns instinctively to bodies upon which he can exercise his skill, living things and things of motion.

The second essential of impressionism, which divides it from older schools, and marks the rupture from the conventional, is the recognition of tones and the correct rendering of near and distant colours. Here it breaks away from all established rules, the tricks of older painters, and endeavours to represent colours, not as they are in the objects themselves, but as they seem to the eye of an observer. Such a recognition of colour values is a distinct advance in art, and a disavowal of the methods of the pre-Raphaelites who painted in colours of one value, totally ignoring the atmosphere and other conditions that alter the relative values of colours. The impressionist admits no rules to regulate the management of colour, and light and shade in his pictures, but paints directly from nature.

Examining next the pictures in which these principles are worked out, it can be readily noticed that they are painted exactly as might be expected to bring out most fully the idea of motion, and the doctrine of tone and colour values. Both pictures express motion, not in detail, but throughout the whole subject. That is, they show a falling light, a sunset, a movement from light to dark. A falling light is the simplest kind of motion that can be pictorially depicted, and it is instructive to notice that both artists have chosen the same subject. In Sargent's picture there is a second motion, the struggling of Chinese lanterns to overpower the dusk. It thus depicts at the same time a rising and a falling light.

The *Harbour of Refuge* represents the two sides of a square of those small almshouses so common in the country. A stone figure on a pedestal occupies the centre of the background, standing out against the red bricks of the building. On a seat at the base of this pedestal are some very old men, idling, driven from the storms of the world to their last refuge, spending their few remaining days in calm. In the foreground is a muscular young man, mowing the grass, behind him a may tree in full blossom. On the other side two figures parading a moss-covered walk, the one a woman in the prime of life, leading the other, a tottering dame bent double with age. Such is the picture; a subject which in ordinary hands would yield little. The first and only strong impression on looking at this picture is that it is evening, and not only evening, but that the sun a few moments before went down behind the row of cottages in the background. The very time of the day could be named so subtly is the failing light rendered. So perfect is the illusion that a prolonged look at the picture causes in the mind the same pleasant, melancholy emotions which sunset produces; in fact, as we gaze on this work of art, we can feel the shades of evening slowly falling.

On looking into the picture it drops to pieces. It must be viewed as a whole, the drawing being subordinated to the general effect. This can be readily seen by close examination of the mower in the foreground, the one figure in the picture in violent action. No detail can be traced in his dress, the folds and creases melting one into the other; yet, at the same time, they flow in the direction of his movement. The result, obtained by a sacrifice of detail, gives a good idea of the man's action. A Dutch painter, delineating the same subject, would have painted with great pains every crease and fold in the man's dress direct from nature, the result being a wooden formal thing, stood up to be painted. The Dutch seemed to recognise this limitation of their style, and they seldom show things in motion.

Another feature to notice, bearing upon the colour values, is that the picture is without those heavy shadows and masses of black so common in the older schools of painting when reproducing a sunset. But, in spite of this lack, the effect of evening is quite natural, proving that the addition of shadows by older painters was but an artifice, and not grounded on observation.

A third feature, showing how Walker must have studied from nature the value of his colours, is the brightness in which some of the objects are painted. Thus, the may-tree blossom is pure white, the colours of a border of flowers in the shadow of the cottages are also bright, and a tube holding a plant is painted a mid-day green. This brightness of colours amidst the shades of evening is a very noticeable phenomenon, flowers always appearing unusually bright in a dull light. Walker must have discovered this fact, and taken advantage of it to brighten the illusion he wished to create.

Sargent's painting is of a simple subject; it represents two children, robed in white dresses, occupied in a garden lighting Chinese lanterns, and suspending them amongst the lilies and laurels. At a first glance you fancy they are attending to the family washing, the next impression is somewhat confused, the eye failing to rest or to be led up to a prominent part of the picture; at last there comes an impression of greyness, it suddenly strikes the mind that it is evening, it is almost dark, and the lanterns are struggling to overpower the dimness and indefiniteness which prevail. The confusion, the indistinctness, the greyness which are the peculiar qualities of objects seen in the dusk, are seized upon and well rendered; the subject is likewise arranged in a manner to increase

the illusion, the lanterns faithfully recording their struggle to extinguish the dying light of day. Of beauty of form, or even form, in this painting there is none, the only attempt at graceful outline being the figure of the child in the foreground. On a closer scrutiny all detail and outline melt away; a conception of the picture is not possible without viewing it from a distance and as a whole. This picture likewise has none of those heavy shadows we associate with paintings of evening, in fact the black stockings of the child partake of the general greyness. As we look on them, the children, lanterns, and lilies appear to sway and vibrate, and produce on the mind a strong sensation of motion throughout the whole there is an appearance of life and of vitality which is very striking.

From the foregoing it may be deduced that the most prominent features of these paintings are: (*a*) the lack of detail, (*b*) the impossibility of taking a part away from them, (*c*) the general weakness of form and outline, (*d*) the representation of dusk by middle tones instead of dark tones, (*e*) the extension of the falling light through every part of the subject.

Lack of detail, and weakness of form and outline are the first necessities of the impressionist; and in the photographic school these traits are most marked. Fuzziness is forced upon the impressionist because by that method alone can he express the greatest amount of motion in his production. In the old numbers of *Punch* the wheels of a moving cab were represented by a number of radii taking the place of the spokes. This artifice was fairly successful. It had the defect of making the wheels go and the cab stand still. The impressionist, taking up this method, simply extends it, and carries it on through the whole of his picture. Such a plan is the only one by which motion can be suggested to the imagination by the eye. To paint a body in motion with sharp outline and minute detail is fatal. At South Kensington is a picture of this class called *Disturbed*, a bird on the wing just risen from a nest, it is nothing but a stuffed one, suspended in mid air, and we unconsciously look for the wire which upholds it. Turner recognised this necessity in his *Great Western Railway*, but he went too far and destroyed the actual structure of his subject.

JOHN A. RANDALL.

(*To be continued.*)

A SIMPLE METHOD OF STRIPPING GELATINO-BROMIDE PLATES FOR USE AS FILM NEGATIVES.

[Photographische Correspondenz.]

STRIPPING plates are to be had commercially, but they have certain drawbacks (the film often comes off in development), and generally they must be ordered in advance. In consequence of this, for a considerable time ways and means have been thought of for stripping an ordinary dry plate, without special preparation in the manufacture. As an example, we may mention treating with hydrofluoric acid, a plate tanned with alum; but the film must be transferred to another plate, and is often distorted, as the gelatine expands unequally, notwithstanding the hardening process.

Fluorides and citric acid are, however, better.

Hill & Barratt obtained an English patent for a method of stripping gelatine films from glass. For this purpose they used a mixture of

Fluoride of soda	1 drachm,
Citric acid	9 drachms,
Water	7 ounces,

in which the gelatine negative was dipped. But there is considerable expansion of the film, and it increases with the amount of citric acid in solution. Consequently this method, otherwise very useful, is open to objection. A method of preparing film negatives from ordinary dry plates has been worked out by M. H. Reeb, of Paris.

As means to this end he sends out two colourless fluids: "liqueur infaillible," and a collodion "collodion infaillible," contained in yellow bottles of 90 grammes, and 300 grammes.

M. H. Reeb's process, for preparation of a film negative from an ordinary dry plate is very simple and gives good results. We have had the opportunity of using it frequently.

The procedure is as follows, according to the instructions sent out with the preparations:—

1. Soak the gelatine negative in the "liqueur infaillible." The object of this operation is to destroy the adhesion of the gelatine to the glass.

One part of the "liqueur" is diluted with nine parts of water; in this the negative is soaked five to ten minutes, then drained and dried. It matters not if the negative is wet or dry, intensified or not intensified, retouched or untouched, provided that the retouching is insoluble in water.

2. Coating the film with "collodion infaillible."

The negative, after having been treated as above with the "liqueur infaillible" and dried, is placed on a levelling stand in a horizontal position and coated with the "collodion infaillible." For this purpose seven cubic centimetres are used to cover 100 square centimetres (about sixteen square inches).

The collodion is allowed to set perfectly, when it turns a dull milky colour, which passes over to a uniform blue. When it has reached this stage, the negative is well washed and the film is cut through round the margins, with the edge (not point) of a sharp knife. The cut should be made at one or two millimetres from the margin. After drying the film with filter paper, pressed down with an indiarubber roller, which will remove all superfluous moisture, the stripping can be performed with ease. The film is then transferred to the following glycerine bath:—

Glycerine	50 cubic centimetres.
Alcohol	50 ,, ,,
Water	1000 . ,, ,,

3. Drying the films.

The film is dried on the glass from which it has been stripped, but with the collodionised side next the glass. For this purpose, the glass is cleaned by sponging with a little of the diluted glycerine bath, the film is then laid down upon it, whilst still dripping wet from the glycerine bath. a sheet of filter paper is then pressed upon the film with a rubber roller in both directions, and the plate is stood up to dry spontaneously. The film then loses its milky appearance.

The dried film, whilst still on the glass, is again coated with thinned "collodion infaillible" (one part collodion to two parts ether and alcohol) and drained.

If oily drops appear on the surface, they may be removed with a wad of dry linen or a little diluted alcohol. The dried negative is again cut through at the margins, stripped from the glass, and preserved flat between sheets of paper. If there is any difficulty in stripping, the plate is placed in warm water (40° C.), when it will come off directly. Dry between two drying boards under slight pressure in a copying frame.

The process we have just described is very good and practical, and would, doubtless, be very welcome to all if the price of the materials, which Mr. M. H. Reeb has placed upon the market was not so considerable. A small bottle containing 90 cubic centimetres of "liqueur infaillible" costs 2 frs. 50 c. A bottle containing 300 c. c. of "collodion infaillible" costs 4 frs. 50 c., according to the labels. For the worker these prices are too high. We have, nevertheless, introduced the process at the Imperial Technical Institute, and we have succeeded in making up both preparations, and we now find it very inexpensive.

As the matter interested me from the photo-mechanical as well as the chemical point of view, I investigated the composition of both solutions, the "liqueur" and the "collodion infaillible," with very satisfactory results.

The investigation showed that both the solutions in question were of rather simple composition. The "liqueur infallible" is a solution of formaldehyde, similar to that sold by Schering, of Berlin, under the name of formalin, whilst the "collodion infaillible" is an oily collodion, such as we meet with in commerce under the name of enamel collodion (plain collodion with two per cent. of castor oil). The experiments instituted with formalin and enamel collodion gave very good results, and, based upon them, I can give the following cheap and simple directions for the stripping of gelatine plates:—

Formalin	10 c. c.
Water	150 to 200 c. c.

The negative is left in this solution for ten minutes, then dried and coated with a two per cent. enamel collodion, or solution of gelatine.

In the first case, the treatment should be as already described for the "liqueur" and "collodion infaillible;" in the latter, the dry plate is treated as though it were a stripping plate, or a collodion emulsion plate. The plate is placed on a levelling stand, brought accurately to the horizontal, and coated with the following gelatine solution, in a slightly warm condition, to a depth of 2 mm.:—

Gelatine	75 grammes.
Water	500 ,,
Glycerine	10 ,,

Filter through flannel.

After the plates are set, they are set up to dry, and then coated with a much diluted negative varnish, or plain collodion, to protect them from damp.

When they are again dry, the film is cut through with a sharp knife and stripped from the glass.

The action of the formalin is that of an exceptionally good indurator; the film of the dry plate is hardened through and through, and does not adhere so firmly to the glass. It can consequently be stripped easily by means of the collodion or gelatine coating, which adds to the strength of the film. The process is uniformly successful, and gives very good results. For this reason, and because the cost of the chemicals places it within easy reach, I can especially recommend it to practical men.

E. VALENTA.

The Inquirer.

**** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

CHROMATE OF SILVER.—BILLERICAY writes: "Is it a fact, as asserted in this column last week, that an insoluble chromate of silver is formed by the action of bichromate of potash on carbonate of silver? I have treated a film of carbonate of silver in gelatine with bichromate, and the resulting red stain is entirely discharged by washing."

IODINE IN SOLUTION (To "Perplexed").—GERARD writes: "This correspondent, if he wants a strong solution of iodine, had better get the solution sold by chemists, and known as 'Lugol's Solution,' or he can make it himself. It consists of a solution of iodine in iodide of potassium, I forget the official strength, but that does not matter if the quantities used be noted, a solution of any strength can be made and diluted as required, as it mixes with perfect freedom with either water or spirit."

SOLUTION OF IODINE (To "Perplexed").—The tincture of iodine of the chemist is the handiest way of using the halogen, as if not added into too large proportion it mixes readily with water to form a solution strong enough for use on negatives or transparencies in careless hands. If a stronger solution be required, or if, as is sometimes the case with gelatine films, the presence of the spirit is objectionable, the iodine in crystals or scales may be dissolved in a solution of a soluble iodide, or in sal ammoniac, or nitrate of ammonia, all of which greatly increase its solubility. A plan that I have often found useful, when I have not had a soluble iodide or either of the other salts at hand, consists in shaking up the iodine with a solution of carbonate of ammonia or carbonate of soda until it acquires a sufficient degree of colouration. In this case a soluble iodide is first formed, and this then reacts upon the excess of iodine. When the solution, on being allowed to settle, shows the characteristic colour of iodine, it may be known that the iodine is in solution, and a very strong stock solution can be made in this way.—SYNTAX.

News and Notes.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, July 22. *Halation, its Cause and Cure.* Visitors are welcome.

THE South London Photographic Society pay a visit to St. Albans on Saturday, July 25, by Midland Railway, St. Pancras, at 2.25 p.m., returning at 8.39 p.m., fare 1*s.* 9*d.* Tea at Clarendon Temperance Hotel, Chequers-street. To all visitors is extended a welcome, and they are requested to address all communications to A. E. Allen.

ASSISTANTS AND THEIR GRIEVANCES.—A correspondent who had advertised for an assistant, and asked for specimens to be submitted, writes regarding the latter: "I should have liked you to have seen the contents of that package. I suppose it was from one of those very much oppressed assistants. It contained a quantity of soiled specimens, some of which must have been exposed for some time, torn away from backs out of show-cases."

GRIMSBY AND DISTRICT PHOTOGRAPHIC SOCIETY.—The following are the newly elected officers:—*President:* Mr. J. Sutcliffe.—*Vice-Presidents:* Mr. R. C. Long and Dr. Simpson.—*Committee:* Messrs. Hewitt, Tuxworth, Flint, Matthews, Wilmot, Brumpton, T. E. Gale, W. H. Marris, and Botterill.—*Librarian:* Mr. C. Dewing.—*Treasurer:* Mr. H. Dodds.—*Secretaries:* Messrs. John H. Clayton, 43, Tasburg-street, Grimsby, and William H. Marris, 118, Freeman-street, Grimsby.

"THE highly poisonous nature of acetylene has suggested to M. Chuard," says *Nature*, "the possibility of employing carbide of calcium as an insecticide for agricultural purposes. M. Chuard proposes to try thoroughly mixing the carbide with earth, so that, under the influence of moisture, acetylene would be slowly given off at the roots of plants, thus preserving them from attack. At the same time, the by-products, consisting of chalk and a little ammonia, would have a beneficial effect on the soil. It is proposed to try this method against phylloxera. Whether this would succeed equally well in all weathers, wet or dry, is quite another question."

RADIOGRAPHS WHILE YOU MOVE.—Mr. V. E. Johnson, M.A., F.R.M.S., sends us (*Daily Chronicle*) from Alderley Edge a couple of really admirable photographs of the bones of horse's knees taken by the Röntgen rays. He states that the apparatus used was a Grove's battery of six-quart cells, a ten-inch induction coil by Apps, and a focus tube by A. C. Cossor, together with other apparatus, concerning which he proposes to take out a patent; for the novelty of the idea consists in the fact that, as he declares, the horses were by no means still while the "skiagraph" was being taken. He even promises us that with the same device here used he will take photographs of any part of the human animal, not "while you wait," but "as you run."

KINETOGRAPHY.—We have received the following particulars relating to the De Bedt's Kinetograph for showing pictures in motion:—The films are made for exhibition on the standard size Edison kinetoscope. They are fifty feet to 100 feet and 250 feet in length. The De Bedt's kinetograph takes pictures at the rate of five to eighty per second, and can be loaded with 100 feet of film. The same camera can also be used as an optical lantern for projecting the pictures life size on to a screen. The same camera can also be used as a kinetoscope. The weight of the De Bedt's kinetograph is ten pounds, the size is 8×8×6 inches. The price complete is 40*l.*, with a discount to the trade. The address is, The Anglo-American Photo Import Office, 368, Rue Saint-Honoré, Paris.

IN looking over old literature, I have frequently found many useful ideas, which, because of insufficient reflection, had not been thoroughly impressed on my mind at the first reading. For instance, a negative which has cracked without breaking the film may be made to print perfectly by painting the crack on the glass slide with a thin solution of balsam of fir and turpentine, using a small camel's-hair brush for the application. The balsam of fir unites with the broken edges, and, being transparent, nearly obviates the shadow which the crack would ordinarily cast. Or, in photographing hollow silver ware, you may fill it with ice water and make the negative as it begins to sweat, thereby getting rid of the glistening which would otherwise prove troublesome.—H. C. VOORHEES in *The Canadian Photographic Journal.*

MR. F. A. BRIDGE, who has just returned from another photographic tour in Norway, tells us of a very sad accident which happened there on July 4. An American gentleman and his wife, both provided with Kodaks, were being driven in a stolkjerre between Stalheim and Voss, when by the side of the beautiful and placid Opheim Lake there came up a pony which was being led from the mountains, its wooden paniers well filled with milk collected from the cows grazing there. Wishing to Kodak this (to them) unusual sight, they made a halt. A stinging fly had, unfortunately, settled on their own pony's neck; in its effort to shake off the fly, the pony somehow got the rein under the end of the shaft and then commenced to back, and, unfortunately, continued to do so until it had backed itself and its passengers into the lake. The "Gut," who had been driving, jumped off, but the lady and gentleman, being fastened in by the apron, could not release themselves, and when the bodies were recovered life was extinct. There were to have been grand doings at Stalheim that evening in honour of July 4, but all festivity was abandoned in consequence of this lamentable accident.

A COUNTY COURT JUDGE AND THE RÖNTGEN RAYS.—At the Liverpool County Court on Monday, during the hearing of an action under the Employers' Liability Act, in which a dock labourer claimed 150*l.* damages for personal injuries, the plaintiff's counsel produced two photographs of the injured arm taken by means of the Röntgen rays, which he proposed to put in as evidence. The defendant's counsel objected to them being received, and stated that he had no reason to believe that Dr. Buchanan, of the University College, by whom the photographs had been taken, was competent to produce reliable radiographs by the new process. Judge Shand said that, from all he had read concerning the process, he should himself be able to take photographs, providing he had the necessary apparatus. Dr. Buchanan agreed, and stated that it was perfectly simple, and could be done by any one. Judge Shand thought he must admit the photographs, but it would be open to defendant's counsel to address the jury regarding their value or otherwise. The photographs were then produced, and showed clearly the injury which had been done to the bone of the plaintiff's arm. The jury awarded the plaintiff 60*l.* damages.

GELATINE AND PHOTOGRAPHY.—There is one point in connexion with gelatine, and what it has done for photography, that must not be overlooked, though it would be more pleasant to do so if one could. It has rendered photography so simple that there is now very little indeed to learn in it. At one time there was, as in the collodion days, and when the user had to prepare his own paper, &c. As a consequence of this, as in all crafts where there is little to learn, the labour market is over-stocked, with the result that salaries have become greatly reduced from what used to be paid. As in the case of the *employés*, so with those who have businesses of their own; they have increased to such an extent that competition has become exceedingly keen in every direction, with the effect that prices are now so reduced that they are scarcely remunerative. That, however, is not all. There is now generally, in most families, one or more amateurs, and they obtain their material at much the same price as do professionals, so that the cost of everything used is tolerably well known to the lay public. Owing to this, reasonable charges for photographs are often looked upon as being extortionate. Looking at gelatine from this point of view, it is very questionable if it has proved an altogether unmixed blessing to professional photography.—E. W. FOXLEE, in *Autotype Notes.*

"MISCHIEVOUS ADVERTISEMENTS!"—No little of the contemptuous toleration which photography has to endure is directly traceable to the photographic community itself. First there are its workers, and then there are its dealers. The weakness of its workers is that many of them cannot defend their pictures. They find themselves in a false position. They have begun picture-making without knowing anything very definite about pictures, and when their work is attacked they are not sufficiently sure of their ground to endeavour to repel the assault. Others of them, who *do* know what they are aiming at, claim too much for their work, and, of the two, this is a more difficult position to defend than a claim of too little. Then, there are the dealers with those mischievous advertisements of apparatus—the magic apparatus that a child can manipulate without mistake—that produces its splendid pictures on the mere pressure of a button, the turning of a single screw, or the mere putting of a penny (the operator in *this* instance is required to make the intellectual effort of noting that a halfpenny or a button won't do) into a slot. Now can lying, even advertisement lying—which is considered to be the very perfection of the art—further go? Advertisement is useful—often it is a downright necessity—but it ought to be something approaching a rough approximation to the truth. When it is damaging alike to the dignity and worthiness of the pursuit out of which the advertiser seeks

to profit, and for the benefit of which he professes to labour; when it brings both his customers and the pursuit they follow into ridicule and reproach, it is mischievous, and stands self-condemned. The opponents of photography have made most effective use of these advertisements. In the face of them outsiders can *not* be blamed for looking upon photography as a pursuit not quite beyond simpletons and idiots.—G. E. MELLOR in *The Photographic Record.*

THE CAMERA CLUB.—The adjourned General Meeting of the Camera Club was held at the Club-house, as arranged, on May 28, for the purpose of electing Directors of the Company and Committee of the Club for the next twelve months. Some disappointment was expressed that arrangements had not been made for ascertaining the result of the "whip," some members being under the impression that it had been arranged to do this; this, however, was not so. There was a long discussion on various matters regarding the management of the Club, and a proposal was made to still further adjourn the election of the Committee, it being considered by some of those present that it would not be possible to decide as to the election of a Committee until it was known whether a sufficient amount had been subscribed to ensure that the Club would continue to exist; however, after further discussion, including a stirring speech from the Rev. Fitzpatrick, full of that *esprit-de-corps* which used to be such a delightful feature of the members of this Club, it was decided to proceed to the election, and the whole of the old Committee received the somewhat doubtful honour of re-election. A further meeting was called for Monday, June 22, and the meeting terminated about eight p.m. At this meeting the Directors were able to announce that the sum of 800*l.* had been subscribed, and that therefore the Club could be carried on without difficulty. Up to the morning of June 20, on which day the list was closed, 250 members had subscribed 676*l.*, this leaving 124*l.* still wanting to complete the sum of 800*l.*, which was fixed as the minimum amount required to ensure the continuance of the Club in future; at this juncture the Rev. N. R. Fitzpatrick, who had already subscribed generously to the whip, came forward, and, in a splendid spirit of generosity and loyalty to the Club, made a further donation of 124*l.*, so that the success of the whip should be put beyond all doubt. The Committee, feeling that a further effort should be made to induce more members to subscribe, proposed that the list be still kept open until the end of July, so that, if further subscriptions were received in that time, they might still be able to obtain the sum they required without taking so much from Rev. Fitzpatrick. This proposal was agreed to without any dissentients. It was then proposed that a statement of the present position of the Club and its future prospects, together with a short account of the past events, should be drawn up by some members of the Committee and posted to all the members, so that they might see the exact position of affairs, and also that those who had not already contributed to the whip might satisfy themselves as to the desirability of doing so. This also was agreed to, and then, after a few remarks from some of those present, the meeting was brought to an end by a very hearty vote of thanks to our Chairman for all the trouble and attention he had bestowed on the affairs of the Club. This was proposed in a short, but cordially worded, speech by Mr. Pringle, and seconded by a number of members in all parts of the room. Needless to say, it appeared to be unanimously agreed to.—*Camera Club Journal.*

THE ART OF PHOTOGRAPHING BIRDS' NESTS.—The genesis of the idea of illustrating a book on birds' nests from photographs taken direct from nature came about through my brother (who had already written and published a very successful book on birds' nests and egg-collecting), and finding the nest of a thrush one fine morning during a stroll near Enfield, in a very pretty situation, I remarked, "I'll fetch my camera and photograph that." "Right," he answered, "I'll find you some more nests for the same sort of treatment, and I'll write another book on the subject, which you shall illustrate for me by photographs taken in every case *in situ*." We accordingly set to work seriously, but for several reasons did not get much done during that season (1893). I think it well to remark here, that I soon discovered the fact that even with a bird's nest it was of no use to set up the camera and leave it to "make a picture" for itself. I sometimes spent an hour in examining a nest from all sorts of attitudes and points, in order to photograph it from the most picturesque point of view, and such time was, I'm quite sure, well spent, for it has trained my eye and considerably enhanced the value of the work I have done. At the beginning of my career I experimented with a variety of plates, but after a fair trial I finally selected Ilfords, which I now use exclusively, and have more than ample reason to be satisfied with. I use the hydroquinone developer, which I consider the best all round after an extensive test, and the fair trial of others which I have used on the recommendation of photographic friends. My advice to beginners is, When you have begun to understand a good formula, plate, or camera, stick to it, if there seems to be any likelihood of getting good work out of it. The next points I would urge are care and patience. See that your lens is absolutely clean, satisfy yourself that you are going to take your picture from the best possible point of view either for picturesque effect or the showing of some particular part you desire to emphasise. Use every care to prevent your plate from "fogging" or your camera from vibrating whilst a negative is being exposed, get into a fixed habit of noting which plate was last exposed so as to avoid confusion, and the taking of one pretty picture on the top of another, exercise great care in charging and recharging your slides and developing your plates, pains, patience, and cleanliness pay, especially in developing and washing a negative. When out on a long day's work, I have a changing bag, which I am most particular to have carefully adjusted about the sleeves and face so as to avoid any chance of spoiling negatives and thus ruining pictures or the chances of making them. My brother, who is as thorough as a Teuton and as enterprising as a Yankee, always seconds me admirably in the exercise of care and completeness, and sometimes on a very bright sunny day I may be seen just stirring under a heap of garments, whilst he stands quietly by almost denuded of clothing. In photographing nests in grass, rushes, reeds, or low bushes when there is the faintest suggestion of a breeze blowing, my brother and I hold our jackets (sometimes top coats) so as to prevent the wind from shaking the foliage. We made ourselves a screen of green baize, with a sharp-pointed post at either end for running into the ground, but this we discovered to add too much to our impedimenta when making long journeys, so abandoned it. When photographing a bird's nest in bright sunlight, I have generally got my brother to shade the area around it by holding up his jacket or a piece of waterproof cloth in which I carry my slides. This entails a rather longer exposure sometimes, but prevents a nasty sheen (which is a difficult matter at all times to deal with, especially on highly polished shells) from destroying the markings of the eggs where the light strikes them. It also, to my thinking, produces a softer and better picture, although I have obtained some astonishing results (instance pochard's nest in *British Birds' Nests*) where I have been unable to shade the object under treatment. I have now obtained "a screen," at the urgent request of friends who swear by it, but I have not yet had sufficient experience with it to warrant me in saying anything about its advantages or disadvantages. In dealing with nests situated in high hedges, my brother generally borrows a cart (a tumbril is far better than a spring cart for the purpose) from the nearest farmhouse, and backs it into the hedge-row. I get inside, and whilst he holds the shafts I make a photograph. The nests of the hedge-sparrow, greenfinch, and blackbird appearing in my brother's book were all photographed in this way. In obtaining negatives of the nests of tree-builders such as the sparrow-hawk, carrion-crow, ring-dove, and others, I have climbed the tree in which they were situated, or another close by, and dropped the end of a long rope which I have taken up with me to my brother below. He has then attached the camera, and I have hauled it up hand over hand. This is an operation which needs considerable care, as the slightest swing or twist will often dash the apparatus heavily against some branch. When I have secured the camera, I lash the legs of the tripod to the nearest branches and commence to focus. It is generally a very difficult matter to arrange things satisfactorily for this sort of work, and I would earnestly advise beginners, who are not good gymnasts and have not steady heads on their shoulders, to exercise a great deal of care. I am, as a matter of fact, a trained gymnast with some ballooning experience, and feel just as much at home, photographing on the end of a rope with two hundred feet of "thin air" between me and the sea below, as I do standing on a garden path, but all the same I know the dangers of the work and appreciate them. Without any intention of in the least boasting about my own feats, I may mention that only the other day my brother and I affixed a ladder nineteen feet long on the topmost branches of a tree at least fifty feet in height. This was done in order to get a good look into a carrion-crow's nest, which is a very deep one, and obtain a picture with the eggs showing in it. As the branches to which the ladder had to be lashed were near the top of the tree, they were not very thick or strong. This necessitated the position of the ladder being absolutely perpendicular, as any angle would have caused such a leverage on it as to instantly snap the branches. After an hour or two we fixed the ladder up, and ascended and lashed the legs of my tripod thereto. Whilst focussing and preparing to take a photograph, I had a hand occupied on each side of the ladder, and, to prevent myself from falling backwards over, I was obliged to literally hold on by my teeth to one of the rungs. As an illustration of the time occupied in obtaining these difficult-to-come-at pictures, I may mention that the procuring of the above photograph cost us a full half day.—C. KEARTON in *Photographic Scraps.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

July.	Name of Society.	Subject.
20.....	Bradford.....	*Intensification, Reduction, and Improvement of Negatives.* P. R. Salmon.
20.....	North Middlesex	*Bromide Paper.* S. E. Wall.
21.....	Birmingham Photo. Society ..	Excursion: Dovedale. Leader, J. H. Pickard.
21.....	Brixton and Clapham	Ordinary Meeting.
21.....	Gospel Oak	Printing Dodges and Working up Negatives.
21.....	Hackney.....	*Fixing and Washing.* E J. Wall.
22.....	Photographic Club	Halation, its Cause and Cure.
25.....	Borough Polytechnic.....	Excursion: South Norwood, Addington, and Bromley.
25.....	Croydon Microscopical	Excursion: Horley. Leader, A. Roods.
25.....	Leytonstone	Cycle Run.
25.....	South London	Excursion: St. Albans. Leader, A. E. Allen.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 9.—Mr. H. C. Rapson in the chair.

Mr. Edwin Banks was nominated for membership.

DARK-ROOM ILLUMINATION.

Mr. BECKETT thought it was a very common habit with photographers to work with too little light.

Mr. HENDERSON believed the time not far distant when they would find out what actinism really was, and how to counteract it, and that they would be able to manipulate in a light very nearly as good as that of day. He recalled a competition he had instituted years ago for the discovery of a light that would have no effect on a certain plate in a given time which he fixed, but which, unfortunately, elicited no response at the time, although, some time after its withdrawal, a method was submitted to him which consisted in perforating a doubled piece of card with pinholes, and then partially opening out the same, resulting in a sort of diffused light, which was said to be quite safe.

The HON. SECRETARY was in the habit of using a gas burner outside a window, constructed of a sheet of ground glass backed up with a brownish-orange glass, and one thickness of canary medium, which answered admirably. For orthochromatic work he had an extra ruby glass, but only used this extreme cases.

Mr. HENDERSON pointed out that different samples of canary medium varied in quality. The original, which was of a greenish-yellow colour, worked exceedingly well.

Mr. BULLEN said it could be got in any quantity at Marion's, and thought very few plate-makers were without it; in fact, the only time that bare glass was used was in examining the plates for spots and dust.

Mr. Bayston used an ordinary oil lamp provided with one thickness each of yellow glass and commercial orange paper. He found that plates exposed to this light for five, ten, or fifteen minutes at twelve inches distance fogged in every case, while, when exposed to a candle shaded by a piece of opaque material to prevent the direct rays from falling on the plate, and, at a distance of fifteen feet, very little, if any, effect could be found. With the former light, however, in developing, no ill effect was experienced.

Mr. Teape's experiments, which he had made very severe, pointed to Christia medium as the best substance for illumination he had tried, one thickness being superior to several of others.

The Chairman had had a contrary experience, an ordinary plate fogging very rapidly.

Mr. WELFORD thought the fact was overlooked that none of these media would stand a very extended exposure to sunlight without bleaching. He contended that the size of the window did not matter. With a larger window no more light fell upon the plate, but one could see better round the room, and so supposed the light stronger.

The HON. SECRETARY differed. With daylight the size of the window is certainly a factor, and one should regulate the distance of the sink accordingly.

Mr. BECKETT would like to know the definition of a safe light. Seeing that all light fogged plates, a window with one foot of area would be safer than one of sixteen feet. As to whether artificial illumination or daylight should be used, he would never use the latter again for developing by. The former was much more manageable and more constant.

PHOTOGRAPHIC CLUB.

JULY 8.—Mr. R. P. Drage in the chair.

Mr. GOTZ made his report of the result of the Club's first summer outing. He said that he had no cause to regret the trouble which he and his coadjutor (Mr. Stretton) had taken in connexion with the outing. Although the numbers present were not large, the company thoroughly enjoyed themselves—they had a jolly time and splendid weather. They were specially indebted to Mr. Stretton for the use of his boat. The feeding arrangements turned out satisfactory, and the trip generally was a success. He passed round a group of the excursionists. Another year Mr. Gotz hoped that a larger percentage of ladies would be induced to attend.

Mr. WELFORD—as one of the party—recognised the strenuous efforts which the organizers of the excursion had made. He moved that they be heartily thanked, and Mr. FOXLEE having seconded the proposition, and added a word or two in favour of Mr. Gotz's idea that ladies should be specially invited to attend on future occasions of the sort, it was carried unanimously.

The CHAIRMAN welcomed Mr. Tagliaferro to England and the Photographic Club.

Mr. Wallis handed in a sketch illustrating a new view-finder which he had seen. This device—which was recognised by several of the members present—was of the same type as the Heywood finder, viz., a metal frame and a sighting point. It was stated that, although useful for a fixed camera, it was not without objections from the hand cameriat's point of view.

Brixton and Clapham Camera Club.—July 7, the chair being occupied by the President (Mr. J. W. Coade).—Alterations in the rule relating to the election of officers at the annual general meeting in January were considered and agreed to, and a special committee elected to arrange details of the forthcoming Exhibition, which will be held early in October next, and will include both open and members' classes, silver and bronze medals being awarded to successful competitors in each class.

A MEMBERS' excursion to Perivale and Greenford took place on Saturday, June 27. The attendance was not so large as might be desired, but the ramble was a most enjoyable and successful one, a result largely due to Mr. R. Whiting, of the Ealing Photographic Society, who kindly acted as conductor.

Croydon Camera Club.—The award of Mr. John A. Hodges, F.R.P.S., who was appointed to judge the lantern slides sent in competition for three prizes offered by the Croydon Camera Club to its members, has just been published. Forty-five entries were forthcoming in two classes. No competitor was, however, allowed to take more than one prize. In Class A (architecture) the prize (half-a-guinea) went to Mr. Hector Maclean for a "clean," forcible view of the half-ruined remains of St. Thomas's Church, Winchelsea. In Class B (any subject other than architecture) the first prize (half-a-guinea) was given to Mr. A. E. Isaac for a clever and striking composition of river, trees, and clouds, entitled *A Stormy Evening;* it is the least hackneyed of the landscapes submitted. Second prize (5*s.*) fell to Mr. H. E. Holland for an admirable scene on the River Teign, near Chagford. In this the colour and general technique are most praiseworthy, also to be greatly commended is the placid beauty of its subject.

Croydon Microscopical and Natural History Club (Photographic Section).—On Saturday a party of fifteen visited the remains of the old Roman villa at Darenth, Kent. This is situated about a mile from the Farringdon-road Station (L.C.D.R.), and is close by the old Roman road connecting Rochester and London. The excavation was first commenced in 1894, after a burial of probably 1500 years, although the site is marked on old ordnance maps. Crossing the field close to the station, the party proceeded by the high road as far as the mill pond through which the river Darent flows. Here several interesting botanical specimens were obtained by means of wading by an adventurous and enthusiastic member of the party. Among the plants found was the flowering rush, by no means a common plant. The path then skirted the banks of the river until the villa was reached. The remains are the most extensive yet discovered in England, and it is supposed that the villa was the residence of a high military officer of the Roman army of occupation. From east to west is an unbroken line of rooms and other enclosed places extending for 450 feet. In front of those to the south is a corridor of the same length. Beyond the corridor are two courts, ninety-two and ninety-one feet long, and seventy-eight feet wide respectively. Along the east and west sides of these courts a series of rooms extends for some distance. The centre of the house was occupied by the cold rooms for summer use. Three of these are paved with red tesseræ, the remainder with concrete and tiles. Some of the walls are adorned with distemper painting, but the colours have now almost disappeared. The winter rooms are at the south-east corner, and the floors of the heated chambers were suspended in various ways. One was laid on piles of flat tiles, two others were supported on flue tiles, and a fourth on blocks of chalk in rows about six inches apart. Flue pipes still remain in the walls. The doorways of one or two of the rooms had been blocked in Saxon times with herring-bone work. The baths are situated at the west of the summer rooms, the largest being forty feet long and ten feet wide, and the walls are still four feet high. This was reached by four steps plastered and rounded at the edges, but at some time during the Roman occupation a wall had been built across it. Two small baths, about seven feet square, connected with rooms probably used for dressing, adjoin. There are several tanks at the north angle, originally fitted with leaden pipes, a portion of one still remaining. These communicate with a water channel discharging into a drain. At the southern and western extremities of the courtyard are the remains of stables and outhouses, the walls of which appear to extend into the field beyond. To prevent inundations, a wall, 340 feet in length, had been erected between the river and the courts. The foundations of the villa are now from four to five feet below the surface. Numerous antiquities have been found, such as coins, ornaments, knives, fragments of pottery and glass, and bones of various animals. The foundations of a small temple have also been discovered close by. From the fact that the walls of the adjacent church at Darenth contain many Roman tiles, it is supposed that the materials from the ruins of the villa were used in the construction of this edifice. Successful photographs, showing the hypocausts and other special portions of the villa, also a general view of the entire remains of the villa as now seen, were obtained by Messrs. Sparrow, Page, and Baldock.

Dulwich Photographic Society.—The members of this Society, on the 27th ult., visited Childwick Bury, St. Albans, the residence of Sir J. Blundell Maple, M.P., by his kind invitation. Some good pictures of the house and grounds were secured, after which the party were entertained to tea. The Society is now arranging a steam launch trip up river.

Ashton-under-Lyne Photographic Society.—On Saturday the Ashton amateur photographers and a few friends, to the aggregate number of forty-five, went on a day excursion to the ancient city of Lichfield for the purpose of taking views of its beautiful Cathedral. The party left Oldham-road Station, Ashton, at 8.10 a.m., and included, amongst others, Dr. A. Hamilton (President), Mr. J. W. Kenworthy (who acted as leader), Major R. Bradley, Rev. J. M. Craven, Messrs. T. Glazebrook, E. Hampson, J. Morris, W. Morris, S. Woolley, S. Sharp, T. F. Kershaw. J. Shaw, W. H. George, E. Belfield, W. Duckworth, J. Greenhalgh, J. H. Lawton, W. Marsland, W. M. Hyslop, H. Hurst, J. Jones, J. K. Greenhalgh, J. Taylor, J. Urmson, W. Leigh, J. Hutchinson, Mrs. Moores, and Mr. R. T. Marsland (Secretary). Lichfield was reached two hours before mid-day, and the party at once proceeded, some in conveyances and others on foot, to the one attraction of the city. In traversing the mile and a half or so from the station to the Cathedral, one got the impression that life moved slowly in the city, and this impression received ample confirmation—in the case, at least, of five unfortunate individuals—before the day was over. On arriving at the scene of operations, no time was lost in fixing the tripods and adjusting the lenses to the proper focus for taking exterior views of the building, the morning light being deemed the best for this. While the photographers were busy with their cameras, the rest of the party went on a tour of inspection. The Cathedral itself is an imposing structure, dating far back into the misty past. Outside, the most striking portion is the west front, in which there are three entrances. The doors are partially covered with old ironwork, the arches are so richly sculptured as to present quite a mass of foliage and figures, and, studded all over the extensive front, are other figures in bas-relief, representing the genealogy of Christ and of ancient kings and princesses, who have encouraged the growth of Christianity. Entering by one of these doorways, the steps of which are worn low by the incessant tramp of feet, what a change there was—what a contrast! Outside was the glare of a hot sun, and the animation occasioned by the fresh arrival of visitors; within, the atmosphere was deliciously cool, and the vast interior productive of restful calm. Dim shadows lingered amid the clustering pillars and away up into the lofty arches, and in deep recesses, where the eye tried in vain to separate formless objects from the surrounding gloom. One admired the amazing height and girth of the numerous ornate columns, wrought by cunning hands in a long-vanished past; the soft lights and shades were restful to the eye, and the solemn silence, disturbed only by the casual footsteps of visitors flitting hither and thither, as soothing to the spirit. Presently music, soft and sweet from the choristers chanting the psalms for the day, faintly broke the impressive stillness, and the music rose and fell in undulating cadences as one wandered to the extremities of the transepts, or in and out among the effigies—the mute monuments of departed greatness. At 4.20 the members and friends assembled near the north doorway, and were photographed in a group, and immediately afterwards an adjournment was made to a neighbouring hostelry, which, for reasons best known to the five individuals before mentioned, shall be nameless, where Mr. Kenworthy generously provided them with a splendid repast. At the close a hearty vote of thanks was passed to him, on the motion of the Rev. J. M. Craven, seconded by Major Bradley; and, a similar compliment having been paid to the Secretary (Mr. Marsland) for the excellent arrangements he had made for the day, the company betook themselves to brakes, which were in waiting to convey them to the station, and home was reached shortly after 8.30. The number of plates exposed was 300, and the number of cameras twenty-one.

Patent News.

The following applications for Patents were made between July 1 and July 8, 1896:—

Lighting.—No. 14,332. "Improvements in Apparatus for the Use of Electric Light, Gas, or Oil for Photographic, Illuminating, and other purposes." A. G. Adamson.

Automatic Photographic Machines.—No. 14,435. "Improvements in and relating to Coin-freed Automatic Photographic Machines." P. Mushet.

Screen Kinetoscopy.—No. 14,443. "Improvements in Apparatus for Producing Magic-lantern Pictures in Space and in Motion." E. S. Bruce.

Magazine Cameras.—No. 14,503. "Improvements in Magazine Cameras." J. J. Clipsham.

Sheath.—No. 14,560. "A Sheath for Holding Plates, Films, or Papers for Photographic or other Purposes." J. Airs.

Developing Tents.—No. 14,593. "Improvements in or relating to Photographic Developing Tents." F. Beresford.

Washing Apparatus.—No. 14,628. "Improvements in Washing Photographic Plates and Prints and in Apparatus therefor." A. Lehmann.

Photographic Apparatus.—No. 14,734. "An Improved Method of Extending and Collapsing Photographic and other Apparatus." A. C. Smith.

Lens.—No. 14,821. "Improved Optical Lens for Exhibition purposes." J. Walsh.

Screen Kinetoscopy.—No. 14,830. "A Camera for Taking Instantaneous Photographs in Rapid Succession, and for Exhibiting the same." J. Scotney-George.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

"PHOTOGRAPHING IN THE NATIONAL GALLERY."

To the Editors.

Gentlemen,—In continuation of my last note, which you kindly published, I send herewith a circular from the Continental firm in question, *and which I readily obtained in the National Gallery.* In view of the fact that in the neighbourhood there are some half-a-dozen heavily taxed, rented, and rated printsellers who have spent hundreds of pounds in the reproduction of National pictures, it seems a strange proceeding on the part of the Gallery officials that they should permit the issue of this circular *within the walls* of the National institution. One of the said printsellers informed me that a lady entered his shop a few days since and expressed surprise on finding that he sold Gallery prints, she having been informed by a Gallery official that they could only be procured *as per circular.* This statement, as made by a reliable and respectable person, will be confirmed on oath if necessary. I think enough has been said to show the Gallery authorities that such extended privileges to *any* firm, much less to a foreign one, is calculated to breed trouble.—I am, yours, &c.,

J. Liddy.

34, *Tunley-road, Craven Park, N.W.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

Photographs Registered:—

Albert Rudolph Douglas, 23, Upper Dicconson-street, Wigan, Lancashire.—*Two photographs of Royal Albert Edward Infirmary, Wigan, Lancashire. Size,* 15×12 *inches.*

F. Bird (Kingstown).—Letters returned. Please send your address.

Cinematograph.—W. H. writes: "Could you kindly inform me where I could get information about the Lumière cinematograph—the price, how to expose, print, and develop the films," &c.?—Write to Messrs. Lumière, Polytechnic Institution, Regent-street.

Transparencies.—A. E. Collings. Any ordinary water colours of a transparent character, such as are used for lantern slides. Messrs. Barnard & Son, and other artists' colourmen, we believe, supply colours specially for lantern-slide colouring.

Hand Camera.—P. O. Malley. The trouble is due to light getting into the camera. As the fog is always at the same corner of the plate, there should be no difficulty in localising the defect and remedying it.

Value of Goodwill.—S. J. and Provincial. It is quite out of our province to value photographic businesses; and, even if it were, it would be quite impossible to do so on the data supplied by either correspondent. Read article on the subject on another page.

Dark Slides.—S. J. If a very sensitive plate be left in a dark slide fully exposed to a strong light for a time, it will be fogged, and even show the grain of the wood and the form of the panels. No careful operator leaves his slides so exposed, as he knows what would be the result. Use more care in future.

Enamelling Prints.—Enamel asks: "Can you inform me as to the best method of enamelling albumenised silver prints?"—Space is too limited in this column to give the working details. Several articles on the subject will be found in the Almanac for the current and past years. Refer to these; they give full working instructions.

Mountant.—W. Wilson. Dextrine—that is, dextrine as found in commerce—is not to be recommended as a mountant for photographs, because it is almost invariably acid, and in this state might have a pernicious action on the picture. If the dextrine were pure, and free from acid, we see no objection to its use, and it would be a convenient mountant.

Albumenised Paper.—R. Ovenden. There is no very great difficulty in albumenising paper, though it requires some practice before proficiency is attained. As you only consume a ream or two a year, we can assure you that it would be false economy to albumenise your own. You can purchase it cheaper and better than that you would be likely to produce, if you have had no experience in the work.

Sensitising Paper.—Sensitiser writes: "I have some Double albumenised paper (cross swords) brand, which I want to sensitise; will you be good enough to give me instructions for same? I have an argentometer and some nitrate of silver by me."—Make up a solution of nitrate of silver, fifty to sixty grains to the ounce of water; place in a dish, and float the paper on it for two to three minutes, and dry.

Opalines Peeling off.—F. W. R. says: "I have done a quantity of opalines lately with P.O.P., and, although I do not harden the prints with alum, I find the greater quantity of them leaving the glass at the edges; and, as you cannot use the hot gelatine, could you advise me in any way?"—Coat the glass with a solution of gelatine, and let it thoroughly set. Then squeegee the print down upon that, instead of on the bare glass.

Photographic Paper.—T. Coombs writes: "Is there no cheaper paper than the Saxe and the Rives that will do as well for albumenising and photographic purposes generally? The price of these papers is simply extortionate as compared with the very best writing papers."—We know of no paper that answers so well. The manufacture of all the photographic paper used throughout the world is confined to two, or, perhaps, three, firms on the Continent. They have the business entirely in their own hands.

Lenses.—Captain Woolley writes: "I have hitherto worked with a half-plate Ross's rapid symmetrical, but am now desirous of getting a whole-plate lens for a new camera, and after reading your remarks in this year's Almanac, never having used an anastigmat myself, I am still undecided whether to have a rapid symmetrical or a Zeiss, Series IIa, which Ross says would suit me, as I like a long focus. Is it only a matter of rapidity that constitutes the principal advantage of the Zeiss?"—In reply: The anastigmats have the advantage over the older forms in freedom from astigmatism, while they give a flatter field and are more rapid.

Sale of Business.—Victim writes: "I can sympathise with your correspondent 'Sold,' replied to a fortnight ago. I, too, have been sold in the purchase of a business, for which I paid a good price. I have been in it now nine months, and I find that the takings are not more than half what they were represented as being for the corresponding months of the two previous years. In fact, there are no profits at all after the expenses are paid. Surely, there ought to be some remedy for this kind of thing?"—There is, if there has been a fraudulent misstatement as to the amount of business that was done. If that can be proved, the law will give ample redress.

Fading Prints.—W. G. H. The prints are certainly in a sorry plight, considering they are only a couple of months old. They are on board of a much commoner quality than is usually employed by professional mounters. It does not follow, however, that the mounts are the cause of the fading, because some common board is occasionally more inert on photographs than is some of the more expensive kinds. The only way to arrive at the cause of the fading is by a thorough chemical examination. A noteworthy feature in the case is that several of the prints have the imprint upon them of a foot rule. It would be interesting to know at what stage of the work this was used, what for, and of what material it is composed?

Faulty Dark Slides.—C. Wright writes: "I enclose a print from each of two negatives, in which you will see that they are fogged through the light getting through the wood of the shutters. You will see distinctly the shape of the panels, but no trace of fog where the flexible material of the hinge is. The plates were exposed in very bright sunlight, but the slide was not exposed to it more than could be helped. The shutters, when examined by direct sunlight, seem perfectly opaque. Have you ever seen such a case before?"—Yes, more than once. The shutters of some dark slides are much too thin for some of the very rapid plates now made if they are exposed for long to a bright summer light. Thicker wood means greater weight, and that many object to. The only thing we can suggest is to reblack the inside of the shutters, and protect the slides as much as possible from light when in use.

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EX CATHEDRÂ.

Mr. J. Howlett, of East Dulwich, writes to us with regard to a couple of Answers to Correspondents, in our last issue, on the subject of defective dark slides, that he was formerly troubled in the same direction, until he adopted a simple expedient that has proved a perfect remedy. Having frequently noticed, when working in the open air, in a strong light, that his plates were more or less fogged or veiled, except where the cloth hinge of the shutter crossed the plate, he came to the conclusion, as stated in our Answer, that the wood shutters were not sufficiently thick to afford adequate protection to the plates. He sent the slides to the maker, and had the whole surface of the shutters covered with the black cloth or drill, instead of merely a strip to form the hinges, and since that has never had a fogged plate; which reminds us that, some few years back, we saw a set of slides made by an amateur, the shutters of which, for portability's sake, were constructed of such thin wood that, in its unblacked and unprotected condition, it was quite translucent in a fairly strong light. But, for the double purpose of giving strength and opacity, the inner sides of the shutters were covered with stout black jean, the pores of the wood being first filled up by rubbing in lamp-black mixed with thin glue, the result being that the slides were perfectly light-tight. The remedy is for leaky shutters seems a simple one that might be taken notice of by camera manufacturers.

* * *

The same gentleman also sends us what he terms a "wrinkle" in connexion with sulphite of soda, suggested by a recent allusion to the anhydrous salt. He says, and we fully agree with him, that there is a vast amount of stuff sold as sulphite that contains but a very small proportion of that salt, the crystals, instead of being large and well formed, being small and mixed up with dusty powder. On getting such a sample, he says, "I sift out the dust and proceed to make a warm saturated solution of the remaining crystals. I then partly fill a glass boiling flask with the crystals, and cover them with the warm saturated solution, which is then raised to the boiling point by immersing the flask in a saucepan of boiling water, the contents being kept in motion by a gentle swirling action of the flask. When as hot as it can be got in this manner the liquid, after a final shake, is quickly poured off into a thin beaker glass, when it will be found to be milky or opaque from the presence of a fine powder held in suspension, which is supposed to be anhydrous sulphate of soda. This quickly settles down, and the supernatant liquid is poured back into the flask, and the boiling operation repeated until no more of the anhydrous salt can be extracted, or until a sufficiency has been obtained. If allowed to cool, after boiling, the white powder will redissolve, hence the necessity for pouring off the liquid quickly. In this manner I get even from the most suspicious-looking samples a product which in dissolving to saturation at normal temperature is far nearer to the correct composition of neutral sulphite of soda than the majority of samples sold as such, as can be proved by the barium-chloride test followed by hydrochloric acid."

* * *

This seems to be a very simple method by which, under unfavourable circumstances, a tolerably reliable solution of sulphite may be obtained. As met with in commerce, the crystals too often consist almost wholly of sulphate, but by taking advantage of the peculiar property of sulphite of soda of separating, in what is supposed to be the anhydrous condition from boiling solutions, the sulphate is altogether got rid of, and the powder that is collected proves itself by virtue of its separation to be sulphite. Another method by which the

sulphite can be obtained in the anhydrous condition—in which it is a more stable substance than when hydrated—is to keep it for some time at a high temperature, though this, of course, assumes a reliable sample of the sulphite to be selected in the first instance. If the ordinary hydrated crystals be submitted to a temperature of about 300° Fahr. in an ordinary oven or in a sand bath, they will lose the whole of their water of crystallisation, and become compact and glassy in character, and in this state resist oxidation far better. If a demand arose for the anhydrous salt, we have little doubt it would be met by those interested.

* * *

The most serious and sacred matters rarely escape ridicule, or, at least, travesty, and science generally, and photography in particular, are no exceptions to the rule; but, where the fun is good-natured and harmless, one cannot very well complain of it, as was the case with one of Albert Smith's lectures many years ago. In this he happily hit off the capabilities of the photographic lens in the way of distortion in a *Photograph of the Artist by Himself* which consisted of a gigantic hand. The explanation given was that, having to uncap the lens himself, it could not be expected that anything but his hand was visible. Equally good was the *View of Strasburg Cathedral by Night*, a mere daub of black, and the spectator who complained that he could not see the cathedral was met by the inquiry as to how he expected to see it *in the dark*.

* * *

Now the Röntgen rays have come in for their share. A short time back, at a private garden party where various amusements were introduced, a small tent was noticeable, with an announcement something to the following effect, "Come and see the 'Xtraordinary Rays! These extra ordinary rays must not be confounded with the ordinary X rays, but are calculated to both *educate* and *amuse*, and the *artistic* nature of their results has been testified to, amongst others, by several *ordinary R.A.'s*."

* * *

Inside the tent was a table bearing a small glow lamp worked by a battery to represent the Crookes' tube, together with a lot of interesting but apparently useless apparatus, so far as the performance was concerned; for, after a brief "lecture" by one of the "professors" in charge, a candidate came forward to have his hand "shadowgraphed." Laying the hand on what looked like an ordinary blotting pad, it was carefully covered with a dark cloth and a thick book, upon which, when all was declared to be ready, the two operators exerted such an amount of pressure as to extort a yell of pain from the victim, who was then quietly informed it was all over. Then from out the folds of the blotting pad was produced an admirable impression of the hand, the combined result of the heavy pressure and *a sheet of "carbonised" paper*. But the greatest success of the afternoon was the reproduction of the foot of one of the gardeners, which showed only a series of rows of hobnails. This was described as "slightly underexposed, but highly interesting, as it showed so clearly the superior transparency to these rays of the iron nails."

* * *

Messrs. Newman & Guardia of 92, Shaftesbury-avenue write: "We have pleasure in informing you that we have turned our business into a limited liability company. This, however, has been a purely private arrangement, and no shares have been offered to the public. The business will continue under our sole management, and every instrument bearing our name will, as before, be made and tested under our constant personal supervision."

SILVER CHROMATE.

Inasmuch as the silver salts play so prominent a part in photographic work, each one of them, however apparently unimportant, possesses an interest for photographers altogether independent of any practical use or application it may have. This is the case with regard to silver chromate, in connexion with which some discussion has been going on in the Inquirer column during the past week or two.

Chromate of silver, as such, has hitherto found no immediate application to any photographic purpose, although indirectly its services have been called in in more than one process, chromic acid acting as a sort of useful go-between in various reactions in which silver salts are concerned. The well-known application, for instance, of bichromate of potash in correcting a foggy emulsion depends upon the action of the loose atom of chromic acid upon the particles of silver in a state of semi or incipient reduction, which constitute the fog, by virtue of which they are brought more freely within the scope of the free haloids present, to be restored by them to the condition of normal haloids of silver.

Some years ago a method of emulsification was introduced by a French chemist, based upon the precipitation of silver chromate, which, after washing, was incorporated with the gelatine, and subsequently converted into bromide of silver by the addition of a soluble bromide. The *raison-d'être* of such a process is not very palpable when we look at the fact that such an emulsion still requires to undergo the process of washing before it is fit for use, and the only advantage that we could ever recognise as derivable from the method was that, in the days when the conditions requisite in emulsification were less thoroughly understood than they are now, this mode of working went far to ensure a product that would work clean and free from fog.

As a pigment for dark-room windows, chromate of silver has indeed been recommended, and, if properly prepared and used, no doubt fulfils the function successfully; but even here its value has been discounted, while the latest proposed application, for the purpose of making transparencies of such subjects as its pronounced colour will suit, seems to be chemically beyond attainment, at any rate in a direct manner, since those methods which are practicable for the purpose of converting the reduced photographic image into silver chromate, produce it for the most part in a soluble, or partly soluble, condition.

According to *Watts' Dictionary*, if metallic silver is acted upon by strong solution of potassium bichromate, acidified with sulphuric acid, the result is an acid chromate of silver, corresponding in composition to the potassium salt, and said to be "partly" soluble in water. Similarly, the action of such a solution upon a photographic image should produce the same result, namely, should convert the image into one of red chromate of silver, which on after washing would partially disappear. To a certain extent such is the case, though the colour of the converted image is not usually the rich red of silver chromate, or, if it is, it quickly changes, leaving a sickly, yellowish-brown deposit, having none of the characteristics of silver chromate as we know it.

The question of the existence of two separate chromates of silver, corresponding to those of potassium, has been more than once raised, and the description of the acid chromate given above does not seem to argue very strongly in favour of its being a definite compound. A substance that is "partly" soluble in water must, if of definite composition, be very easily decomposed — even, in fact, by contact with water, or else, which seems far more likely, it is a mixture of two or more substances. A definite compound may be "slowly" soluble in water, and totally soluble if sufficient time be allowed; but, if a point is reached at which it ceases to dissolve, it seems reasonable to believe that it is not a definite compound, and this is just the position in which the supposed acid salt stands.

If solution of nitrate of silver be precipitated with a solution of neutral chromate of potassium, a rich purple-red precipitate is formed, which is quickly washed free of any excess of either reagent, and then resists all further action of water. If, instead of the neutral chromate, the bichromate be employed, a precipitate is similarly formed; but it is of a much brighter colour, with more of a crimson or even scarlet tint; but the difference does not cease there. If allowed to stand until the precipitate has settled, the supernatant liquid will be of a deep red colour, even though there be no excess of bichromate, showing that the precipitate itself is partially soluble; and on pouring this off, and replacing it with fresh water for a number of times, each will extract a gradually decreasing quantity of colouring matter until, at length, a point is reached at which the supernatant liquid remains colourless. If the coloured liquids be tested, they will be found to contain silver, showing that the colour does not consist simply of excess of bichromate of potash.

From which we are led to believe that the supposed acid chromate of silver does not exist as a definite compound, or, if it does, it is decomposed by water.

Photography and the School Board.—It seems that one day last week the London School Board indulged its vanity in being photographed while in session. As the time was late in the day, and the light was bad, the members were enjoined to remain perfectly quiet while the operator counted sixty. Evidently the task set them was harder than the majority expected, because, when the "sixty" was reached, it was, it is said, hailed with loud cheers. I would be interesting to learn how many members of the Board are not altogether satisfied with their portraits as depicted.

Vesuvius Active.—According to a News Agency telegram from Rome, Vesuvius, after being dormant for a year and a half, has again awakened, and is in a state of eruption. Two streams of lava are descending the plain of Ginestre, and threatening the line of the observatory. It is added that there is no immediate danger. So far, that is satisfactory; but, as we have pointed out before, an observatory on a mountain, whether Vesuvius or any other, is not the residence that many would choose. The occupants of more than one have had narrow escapes from the elements at times.

Round the World with Cycle and Camera.—Three cyclists started one day last week from St. Pancras Church, accompanied, according to a lay contemporary, by the "inevitable camera" and the minimum of personal luggage, for a cycling trip round the world. It is added that, if all goes well, the tourists will be back again in England in a couple of years' time. A good many photographers will naturally be speculating as to the number of plates or films these travellers will carry with them on their cycles as a two years' supply, in addition to their personal luggage. If they take the whole with them on their machines, the supply, one would surmise, is very limited for a "round-the-world" tour which is to occupy a couple of years.

A Little-known Picture Gallery.—It may not be generally known to many of our readers that it is the custom with Royal Academicians, on their election to membership, to present one of their works to the Academy, usually one of those shown at the last or current Exhibition. It may be imagined that every artist wishes to present one of his best works, so the collection, though not large, contains some of the finest examples of the present and past Academicians' pictures. This collection is deposited at the Royal Academy, Burlington House, and is known as the Diploma Gallery. It is open free to the public on week days. We allude to this interesting Gallery because it does not figure in most of the usual lists of the picture galleries of London.

Raiding the North Pole.—If the Pole is not reached, it is certainly not from a lack of expeditions. There are the Nansen, Jackson-Harmsworth, Andrée (balloon), Peary, all now well on the way. In addition to these there are other arctic expeditions—Sir Martin Conway's and the Swedish Geer-Knorring, &c. In all of these photography is said to be a prominent feature; so it was to have been in most previous ones, though very little has been seen of the results. Although the attempts to reach the Pole have ended in failure, still one would have expected some photographs of the parts visited, or objects met with, to have been forthcoming. However, it is to be hoped that the expeditions now on the way will be more successful in their attempts, both in reaching the desired goal and in photography, than their predecessors. It requires a good deal of courage to face the arctic and antarctic regions, and the uncertainty of when the explorers will be able to get away from them again.

The Metric System.—There really seems some prospect of this system being adopted in this country at no very remote period. In the House of Commons, on Friday last, Sir S. Northcote put a question to the President of the Board of Trade as to whether he would, this session, introduce a Bill to deal with the metric system, so that the Chambers of Commerce, and others interested, might have sufficient time during the recess to consider the proposals of her Majesty's Government on the subject. In reply, Mr. Ritchie said he should be glad to introduce the Bill, as he knew that great interest was being taken in the matter. But he added, that of course he should not introduce it with the intention of proceeding with it this session. From this it would appear that something is likely to be done, eventually, to establish the metric system in Great Britain. Nobody would welcome the universal adoption of that system more than photographers, because all the Continental formulæ are given according to it and ever have been.

Photographs of Feet.—Photographers, just now, are eagerly on the look-out for something in the shape of a novelty to increase trade. This may (?) be of service. A paragraph has been "going the round" to the effect that the latest fashion in Sydney is to have the feet photographed. The paragraph adds, significantly, that is, if they are supposed to be Trilby ones. That we can quite understand, for we cannot imagine any one, male or female, the possessors of feet bearing a plentiful crop of corns, even with a bunion thrown in, desiring to perpetuate them by means of photography. If this kind of thing really is the fashion in Sydney, which is doubtful, it should make it good for the chiropodists as well as photographers, the same as photography often brings grist to the hairdresser's mill. Possibly the appearance of the feet can be as much improved by the chiropodist as the hair can be by the hairdresser, and the owners would certainly like them to be shown to the best advantage. Some time ago it was rumoured that, in Paris, there was a craze amongst ladies for having their hands photographed. But the Antipodes are credited with making a feature of the other extremities.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

LEEDS MEETING, TUESDAY, JULY 14 (*continued*).

WE append the paper on the *Fixing and Washing of Paper Prints* read by Mr. A. Haddon at the meeting of the Convention on Tuesday evening, July 14.

FIXING AND WASHING OF PAPER PRINTS.

By A. HADDON.

THE permanency of a print depends on the thorough removal of salts of silver from the high lights and the subsequent elimination of the fixing agent. The removal of the fixing agent can be easily and most rapidly effected by means of plain water, but the complete removal of the insoluble salts of silver, in the case of albumenised paper, is a task which up to the present has not been accomplished. Hyposulphite of soda will dissolve with ease the insoluble inorganic salts of silver from the paper, but the organic salt, most probably albumenate of silver, is not so easy to dissolve, and, if silver prints are to be made more permanent than they are at present, we must devote our attention to the solution of this difficult problem. The complete removal of the organic salt is not an impossibility, but we must consider the effect of the reagent on the material of which the picture itself is formed.

On August 3, 1893, Mr. Grundy and myself read a paper before the London and Provincial Photographic Association, in which we gave in detail our endeavours to arrive at the cause of the fading of prints on albumenised paper, and also the time necessary for the complete removal of the hyposulphite of soda from such paper by washing in running water.

The method we adopted was briefly this:—Albumenised paper was sensitised on a fifty grain nitrate of silver bath, neutral, for three minutes, the paper was then allowed to dry in the dark. When dry it was cut up into pieces measuring $5\frac{1}{2} \times 8\frac{1}{2}$, *i.e.*, each piece was one-eighth of a sheet. Three sheets were necessary, and each piece from the same sheet was marked so as to distinguish the pieces from the different sheets.

The paper was then washed and fixed just as would have been done had these pieces of paper been prints instead of unprinted paper. The strength of the hypo solution was twenty per cent., and the time of fixation, as usual, fifteen minutes.

In all cases a quarter of a sheet was dealt with in order to obtain a sufficient quantity of material to work upon, and, in order to obtain a mean result, the two pieces were selected from different sheets.

After the washing was completed, two pieces were set aside to determine the quantity of silver to be removed and the amount of sulphur in the paper after fixation, also two pieces were selected to estimate the silver, soluble and insoluble, and the total sulphur. The remainder of the fixed paper was then transferred to a large vessel filled with water, and into which water was running from a piece of indiarubber tubing connected to the water supply. The temperature of the water was 13° C. During the first hour the pieces of paper were constantly turned over by hand in order to prevent them sticking together.

Two pieces were removed at the end of 5, 10, 15, 25, 40, 60, 90, 120 minutes, and 19 hours, and the amounts of sulphur and silver determined.

The estimation of the sulphur and silver was carried out as follows:—

In each case the two pieces of paper were allowed to drain for five minutes, and then torn up into small pieces and placed in a large beaker with a mixture 100 c. c. of nitric acid, and 200 c. c. of hydrochloric acid (free from sulphur), covered with a clock glass, and heated on a sand bath till the paper was completely destroyed. The solution was then taken down to dryness, and 250 c. c. of pure distilled water and three drops of hydrochloric acid added, and the whole heated to boiling, allowed to cool, and filtered, and the filter paper broken and washed with boiling distilled water. The filtrate was heated to boiling point, and chloride of barium added, which precipitated all the sulphates present as barium sulphate. This was collected on a filter, washed, dried, and weighed in the usual way, and from the weight of sulphate of barium the amount of sulphur present calculated.

The chloride of silver on the original filter paper was dissolved out by means of ammonia, and precipitated with nitric acid, filtered off, and treated as in the usual manner.

The figures obtained were as follows:—

	Weight of Sulphur. Grammes.	Weight of Silver. Grammes.
In original paper	·0050	·0734
„ water adhering to paper	·000032	—
„ paper fixed but not washed	·2243	·0086
„ „ after 5 minutes' washing	·0063	·0051
„ „ „ 10 „ „	·0045	·0035
„ „ „ 15 „ „	·0048	·0037
„ „ „ 25 „ „	·0044	·0037
„ „ „ 40 „ „	·0043	·0033
„ „ „ 60 „ „	·0046	·0036
„ „ „ 90 „ „	·0047	·0038
„ „ „ 120 „ „	·0045	·0040
„ „ „ 19 hours „	·0047	·0039

From these figures it will be seen that, after ten minutes' washing in rapidly changing water, as much hypo and silver are eliminated as can be removed in nineteen hours. After ten minutes' washing, the quantities of sulphur and silver become constant.

From the figures given above, it can be easily calculated that about a quarter grain of metallic silver remains in a whole sheet of albumenised paper, and this after the paper has been as thoroughly fixed as is possible using hypo, and after washing so as to remove all that water can dissolve out.

This quantity of silver spread over an area of 17×22 in. might at first sight seem to be so small as to have no colouring power when converted into chloride and acted on by light.

Paper fixed and washed as described when brought into contact with sulphuretted hydrogen turns brown. When the gas is used it requires time, but when a solution of the gas is employed the action is much more prompt.

The existence of silver in albumenised paper which has not been exposed to light, but has been fixed and washed, can be easily shown by first converting the silver, in whatever form it may exist in the paper, into chloride (by soaking it in chlorine water and washing) and then resensitising by brushing over the surface a weak solution of nitrate of potash. Such paper, when exposed under a negative, gives a fairly strong print—much stronger, indeed, than would be ascribed to the small quantity of silver present.

In the case of gelatino-chloride of silver paper it is possible to remove the whole of the silver when the paper is fixed in a fairly strong solution of hypo, and the amount of washing, with running water and proper care, was not found to exceed that required in the case of albumenised paper.

It ought not to be astonishing that the whole of the silver from the high lights of pictures on such paper can be removed, as most probably the gelatine is never, during the preparation of the emulsion, in presence of an excess of nitrate of silver, and from this cause no organic salt of silver is formed, as in the case of albumenised paper. Gelatine, however, is a very treacherous compound to deal with, and, if any change in colour take place in a print on such paper, it must be due to imperfect fixation, bad washing, a combination of the two, or to the gelatine itself undergoing change.

Long soaking in the case of gelatine papers is a disadvantage, as the water dissolves out the alum used by the manufacturer to harden the gelatine, and, if under these circumstances the prints are squeegeed to glass or ferrotype plates, they invariably stick, and cannot by any means be removed perfect.

Many photographers are under the impression that, in consequence of the greater thickness of the layer of gelatine as compared with albumen, it requires a longer soaking to remove the salt: but this is a mistake, as gelatine allows the solution of the salts to diffuse through it with equal or even greater facility than in the case of albumen.

The results I have given you thus far are those obtained when the paper has been washed in running water; but this mode of washing cannot be universally employed, as in some cases water may be scarce, and in others it may not be convenient to leave the prints to the tender mercies of the servants in the kitchen, or even in the bath room, and then it becomes necessary to remove the hypo by soaking the prints in water contained in shallow dishes. When this method of washing is adopted, three questions have to be answered before we can say that all the soluble salts have been removed from the prints.

1. What must be the ratio of the volume of water to the area of paper to be washed?

2. How long must the prints be allowed to soak in each quantity of water?

3. How many changes of water must the prints be subjected to?

These questions we have endeavoured to answer in a paper contributed to the *Photographic Review*, June, 1896, and also read before the London and Provincial Photographic Association.

We selected albumenised paper in preference to gelatino-chloride, as the latter is usually so loaded with sulphate of barium that it is exceedingly difficult to obtain clear solutions by filtration through paper, especially when treating the ash of the burnt paper with ammonia; and, from what we now know, it is perfectly clear that what is true of the one kind of paper is equally true for the other as regards time of washing.

We did not attempt to determine the amount of sulphur left in the paper, as it will be remembered that, in the case of albumenised paper, washed in running water, the sulphur and silver disappeared at the same rate, and that, when the quantity of silver became constant, then also did the sulphur, so that the determination of the silver, left at given intervals of washing, was a difficult guide to say how many changes of water, under given conditions, the paper should receive.

The albumenised paper was marked, sensitised, washed, and fixed as already described.

The first thing to be decided before proceeding to the washing of the paper was the ratio of the volume of water to area of paper. For convenience of measurement, we settled on 1 c. c. per square centimetre of paper, *i.e.*, roughly about 1 fluid ounce of water to every 4½ square inches of surface to be washed.

After the prints had been fixed the requisite time, they were plunged and separated from each other as rapidly as possible into the measured quantity of water. After soaking for five minutes with constant movement, two pieces were taken out and dried, the remainder being transferred to another dish with the quantity of water diminished in proportion to the area of paper removed.

This operation was carried on till the last pieces received ten soakings of five minutes each in ten different changes of water.

A portion of each washing water was set aside for testing with permanganate of potash, iodide of starch, and sulphuretted hydrogen, dissolved in water.

It was found, by a preliminary experiment, that one drop of each of the solutions of permanganate and iodide of starch produced a distinct colouration in a test tube, filled with water, six inches long, when looked through lengthwise at a sheet of white paper. In order to ascertain when the hypo in the washing water had exactly done its work, such a number of drops of the reagents were added to the water, in similar test tubes, so as to just match the tints in the test tubes filled with plain water and one drop of reagent.

The number of drops required in each case, and the amount of silver left after each washing, will be given in a table presently.

The papers being dry, they were placed in a porcelain dish, and heated till ash free from carbon was left. The ash was then washed several times with boiling distilled water, and then boiled with dilute nitric acid, in order to dissolve out the metallic silver. The contents of the beaker were then filtered and washed, and the ash on the filter paper subjected to the action of strong ammonia, in order to dissolve any silver chloride that might have been formed due to impurities in the nitric acid. This, when filtered, was treated with nitric acid, and added to the previous filtrate; the whole was then heated to the boiling point, and a few drops of hydrochloric acid added to precipitate the silver as chloride. The precipitate was then collected and weighed, and the silver estimated in the ordinary way.

The following table gives the results obtained:—

Change of Water.	Silver in Quarter Plate.	Number of Drops of		Sulphuretted Hydrogen.
		Permanganate.	Iodide of Starch.	
1	·0055	more than 10	more than 10	brown colour.
2	·0045	„ „ 10	„ „ 10	faint tinge.
3	·0040	2	3	no colour.
4	·0040	1	1	„ „
5	·0044	1	1	„ „
6	·0042	1	1	„ „
7	·0044	1	1	„ „
8	·0040	1	1	„ „
9	·0043	1	1	„ „
10	·0040	1	1	„ „

These results show that, at the end of the third washing, the amount of silver becomes constant, and that farther washing has no effect as regards reducing the quantity of silver left in the paper.

The hypo indicators also point to the same result, that, after the third change of water, no hypo is present to discharge the colour of the permanganate or decompose the iodide of starch.

Three soakings in different water seems at first sight insufficient washing to remove the salts, but at the same time we must remember that all that the water has to do is to displace a given volume of the solution of hypo contained in a medium through which diffusion can take place very readily. The silver is already in solution, and it is merely a matter of rate of diffusion. Naturally it takes longer for the last traces to be removed than it does for the bulk of the salts to pass out.

Five minutes ought to be amply sufficient for the salts to diffuse out into the surrounding water; and, if this be so, it becomes a very simple calculation to find how many changes of water the prints must be subjected to in order to reduce the quantity of hypo in a given area of paper to something so very small that is is incapable of producing any deleterious effect on the print.

Hypo eliminators have been recommended at different times, and praised by some and abused by others. If the same amount of trouble be taken, using plain water instead of these salts, I am sure equally good, if not better, results will follow. Any hypo oxidiser is dangerous, in that it is likely, by destroying the solvents, to throw down some silver compound when it would not have been deposited if water only had been used. Fortunately, however, we are generally recommended to give the prints three or four washings before applying the compound, and this is the safeguard, for, if it had been applied at an early stage of the washing, its effect for evil would be very much more marked than has been the case.

The removal of hypo and the silver compounds formed is an easy matter if done with care. I do not mean to say that the mere soaking of paper at the bottom of a dish for fifteen or twenty minutes will remove these salts; the prints must be constantly turned over so as to bring fresh water into contact with them. The two or three hours washing, as still recommended by several paper-makers, is a mistake, especially if the prints are left to take care of themselves. In the case of gelatino-chloride papers even proper washing for that length of time is detrimental to the quality of the gelatine, it tends to remove the alum the maker has purposely added in order to harden it, and if it be removed by long soaking, on attempting to glaze such prints by attaching them to any support, they invariably stick. Give a short washing and the result is different.

I am certain, if photographers will persist in their old-fashioned way of washing prints for six or eight hours, that it would amply repay the water companies, where much printing is done, to supply labour free, to constantly change the prints in the water, and give short washings, thus ensuring better results and a less waste of that most valuable natural product H_2O.

The discussion on Mr. Haddon's paper will be found on p. 456 of last week's JOURNAL.

WEDNESDAY, JULY 15 (*continued*).—THE ANNUAL GENERAL MEETING.

The Annual General Meeting of the members was held in the Philosophical Hall on Wednesday morning, the President (Mr. H. P. Robinson) occupying the chair.

Mr. R. P. Drage (Hon. Secretary) read the annual report, showing that up to date the Convention numbered 295 subscribers, of whom 198 had signed the attendance book. There was a favourable balance on the year of 77*l.* 9*s.*; a further sum of 50*l.* had been invested in the Post Office Savings Bank, and the total Convention fund up to December 23 of last year amounted to 127*l.* 9*s.* A recommendation was brought forward by the Council to the effect that there should be some memento of the great services rendered to the Convention by the late Mr. Traill Taylor, and it was suggested that a sum of twenty guineas be devoted to the Traill Taylor Memorial Fund. Mr. F. P. Cembrano moved, and Mr. A. L. Henderson seconded, that a sum of twenty guineas be set aside for the purpose; and this was agreed to, it being left to the administrators of the fund to decide the particular object to which the money shall be applied.

The Secretary stated that an invitation had been received from the Great Yarmouth Camera Club to hold the Convention meeting of 1897 at Great Yarmouth.

Dr. Adcock (Great Yarmouth) said that Yarmouth would be very pleased to have the Convention there next year, and he was sure that the Mayor and Corporation would accord their co-operation.

Mr. George Mason said that the whole of the Glasgow societies joined in inviting the Convention to meet next year at Glasgow.

Mr. John Stuart supported Mr. Mason, but said that he was conscious that Yarmouth really had the preference. However, he looked forward to the Convention meeting at Glasgow in 1898.

Mr. F. A. Bridge formally proposed that the invitation of the Great Yarmouth Camera Club be accepted, and this, being seconded by Mr. J. Porritt, was carried unanimously.

A hearty vote of thanks was passed to the local Committee for their labours on behalf of the Convention, and the compliment was acknowledged by Mr. J. H. Walker, Mr. Herbert Denison, and Mr. Godfrey Bingley, each of whom was warmly applauded by the meeting.

The General Committee having been elected, certain alterations in the rules were made on the proposition of Mr. C. H. Bothamley. Briefly, the new rules provide for the abolition of delegates, and of the General Committee; the election of the Council by the members instead of by the General Committee as hitherto, and the adoption of voting by ballot. The details of the alterations were referred to the Council for arrangements.

Mr. Frank Bishop made a few remarks on the aims and objects of the Photographic Copyright Union, to which he invited the support of photographers.

Mr. Addyman suggested that the Convention might take in hand the subject of a fixed tariff for headquarters, similar to that adopted by the Cyclists' Touring Club, and the President promised that the Council would take the matter into consideration.

The election of the Council was then proceeded with, and resulted as follows: Mr. H. P. Robinson, Mr. A. Haddon, Sir Howard Grubb, Mr. E. J. Appleby, Mr. Thomas Badding, Mr. Godfrey Bingley, Mr. C. H. Bothamley, Mr. F. A. Bridge, Mr. F. P. Cembrano, Mr. Alexander Cowan, Mr. Herbert Denison, Mr. M. J. Harding, Mr. H. M. Hastings, Mr. Paul Lange, Mr. C. Phipps Lucas, Mr. Percy Lund, Mr. J. L. Lyell, Major Lysaght, Mr. George Mason, Mr. Thomas Mayne, Mr. W. W. Naunton, Mr. J. Porritt, Mr. A. Pringle, Mr. J. C. Ruthven, Mr. A. Seaman, Mr. J. Stuart, Mr. H. Sturmey, Mr. W. Taylor, Mr. A. Tate, Mr. E. J. Wall, Mr. H. Snowden-Ward, Mr. G. Watmough Webster, Mr. S. B. Webber, Mr. J. B. B. Wellington, Mr. F. W. Williams, Mr. A. F. Mowll, Mr. A. Horsley Hinton, and Mr. W. D. Welford.

The proceedings of the General Meeting then terminated, and members adjourned to the Yorkshire College. They were introduced to Professor Bodington (Principal of the College), who gave them a cordial welcome, and they were then conducted over the various departments by Professor Smithells. Mr. Donald MacIver then took the group on a stand specially erected for the purpose. In the afternoon the members divided into scattered parties, and visited places of interest within easy distance of the city, Kirkstall Abbey and Roundhay Park being the chief points of attraction. The weather was dull and rather cold for the time of the year, and not much work was done with the camera. Some of the members also paid a visit to the Carlton Hill Works of Messrs. Watkinson & Co., manufacturers of photographic apparatus.

The Annual Dinner.

The annual dinner took place at the Queen's Hotel. Covers were laid for over 120 ladies and gentlemen. The President (Mr. H. P. Robinson) occupied the chair. Among the guests present were Principal Bodington, Mr. J. W. Willans, Mr. Edmund Wilson, and Alderman Hepworth. The Chairman gave the toast of "The Convention," which, he said, at no period had been in a better financial or social position. A great deal of their success was due to their Secretaries, Mr. Drage and Mr. Bingley, whose names he coupled with the toast.

Mr. Drage, in responding, declared that the Leeds Convention, in the numbers attending it, and in other respects, had been the most satisfactory they had held. He was not born an orator, so that they would have to excuse him as much as possible. A great deal of work was attached to the organization of the Convention, but he had been ably assisted by Mr. Bingley. The work was amply recompensed by the smiling faces round him, and they were much indebted to the photographic press for the assistance given.

Mr. Godfrey Bingley, the Local Secretary, also replied. If he had been born an orator, he would have found some difficulty in expressing what he felt.

Mr. C. H. Bothamley gave "The Local Committee," coupled with the names of Mr. H. Denison (Hon. Treasurer) and Dr. Thomas Thresh. The Leeds Committee had, he said, engineered things uncommonly well. They had even managed to break the record by providing them with fine weather on the Convention Tuesday, which was always a wet day with them. They had been received in the city with open hands, and were going away with a great deal more than they brought. Knowing, as he did, the district fairly well, he could appreciate the difficulty the Committee had in arranging their programme.

Mr. Denison and Dr. Thresh briefly replied.

Mr. A. Haddon (ex-President) proposed "Other Photographic Societies."

Mr. Peter Gilston, J.P. (ex-Mayor), replying as the President of the Leeds Photographic Society, made a humorous speech, in the course of which he made some references to the New and Old Photography. He said he had in his way taken some interest in photography, not only as a hobby, but as a study, and he had derived a good deal of pleasure from it. He might not as yet have done anything remarkably great, but he was not without hopes. It was well we should have hobbies, and he knew of none better than photography, which, like mercy, was twice blessed—it blessed in the gathering and in the distribution.

Mr. Green Hirst, the President of the Leeds Camera Club, also replied. The Club, he stated, was started about two years ago with twenty-eight members, but it had now nearly 200.

Mr. F. P. Cembrano proposed "The President," and with the acknowledgment of the compliment by Mr. Robinson the speech-making came to an end. The remainder of the evening was devoted to songs and other musical items.

Thursday, July 16.—Excursion to York.

Over a hundred members undertook the excursion to York, led by Mr. J. H. Walker, Mr. Godfrey Bingley, and Mr. Herbert Denison. On arriving in York, they repaired direct to the grounds of the Yorkshire Philosophical Society, where they were welcomed by Dr. Tempest Anderson, Mr. J. Saville, Mr. H. M. Platnauer, Mr. G. C. Dennis, Mr. F. B. Cattley, Mr. Watson Hirst, and other gentlemen. The Conventioners soon dispersed about the beautiful old city, and we subsequently gathered that, dividing themselves into five or six parties, each having a guide who knew what objects would be best calculated to catch the eye and fancy of the photographer, they set out in quest of some of the tit-bits of quaint and historically or archæologically interesting architecture with which the city abounds. "A given route was started at different stages, hence each group of workers saw much of what was worthy of their artistic effort without clashing with other sections. One party that had Mr. Cattley for its cicerone commenced operations in the Shambles and High Petergate, where the old buildings are replete with interest. Thence they went to Monk Bar, which Mr. Britton regards as the most perfect specimen of this sort of architecture in the kingdom. Next St. William's College, near the east end of the Minster, came under notice, and from there they proceeded to the Cathedral, of the exterior of which they took views from the south, the east, and the north. The west front was left till the afternoon, in the hope that the sun might assist the camera in doing greater justice to this magnificent example of Gothic architecture. Special leave was granted to photograph the south transept, the choir, the Lady Chapel, and the chapter house, inside the Minster, and advantage of this privilege was taken by a majority of the parties. From the Minster, Mr. Cattley took his representatives of the Convention to the picturesque overhanging houses in Low Petergate, and on to Bootham Bar, the Manor House, and St. Mary's Abbey. After luncheon attention was devoted to the Bar Walls, the Guildhall, and the Mansion House and its interesting contents, and Micklegate Bar, the most imposing of all the bars of the city. Drake and Lord Burlington attribute the structure to the Romans, but most writers now agree that it is Norman work. The heads of traitors were formerly exposed there. Hence, the route lay by way of Skeldergate Bridge,

the Blue Bridge, and the New Walk, snap-shots of which were taken in passing, to Walmgate Bar, the only one that retains its barbican, and which is supposed to have been the point where the Watling-street of the Romans entered. The ancient and quaint churches of St. Lawrence, St. Dennis (where the Earl of Northumberland, who fell at Taunton, is supposed to be buried), and St. Margaret's, with its fine Norman arch, having yielded some excellent opportunities, the photographers returned to the Minster. Thanks to better light and less wind, many very satisfactory exposures on the west front of the Minster were got before the various divisions of the party returned to the station." Altogether the number of plates exposed was believed to be nearly 1000.

At the evening meeting the following paper, illustrated by lantern slides, was read:—

SOME NOTES ON ORTHOCHROMATIC PHOTOGRAPHY.

By C. H. Bothamley, F.I.C., F.C.S.

It always seems to me to be a useful function of annual gatherings of this kind to take stock, as it were, of the present position of our knowledge of particular branches of photography for the purpose of seeing exactly where we stand, and what progress, if any, has been made. In the case of orthochromatic photography it must be admitted that very little progress has been made in the past few years, so far, at any rate, as methods are concerned. Erythrosine and cyanine still remain the best-known sensitisers, each in its own way, and no improvements in the modes of applying them have been placed on record. Nevertheless, these sensitisers are of such great practical value that orthochromatic or isochromatic plates have come largely into use, and may fairly be said to be now regarded as indispensable in several special classes of work. On the other hand, it is not likely to be disputed that orthochromatic plates have not with anything like the same completeness displaced ordinary plates for landscapes and other outdoor work. The explanation seems to lie in the fact that most outdoor work is done during the middle of the year, when all subjects, whatever their colour, reflect a very considerable proportion of white light, and the ordinary plates are thus put more nearly on the same footing as orthochromatic plates than they are in the early spring or late autumn.

It is satisfactory to be able to state that, so far as my own experience is concerned, commercial orthochromatic or isochromatic plates are now very much better in both general and special qualities than they were some seven or eight years ago. There are at present available to photographers who do not wish to orthochromatise their own plates, or who wish for such plates with better keeping qualities than can be obtained by the bath process, no fewer than three different brands of commercial plates showing great sensitiveness to yellowish-green and greenish-yellow rays, one brand which shows considerable sensitiveness to yellow-orange and orange-red rays, and one brand which is sensitive to a very useful extent to all rays from yellowish-green to orange red. At the same time, all these plates show, of course, the strong sensitiveness to blue and violet rays which is characteristic of gelatino-bromide plates.

In order that we may be able to search systematically, and not hap-hazard, for new sensitisers, it is indispensable that we should ascertain exactly how the dyes used act as sensitisers, and what is the relation between their sensitising action and their composition and general properties. There are two well-known hypotheses as to the mode of action. According to Eder and Vogel, the sensitiser absorbs the energy of the light rays, and its molecules are thereby thrown into violent agitation. This motion is communicated to the molecules of silver bromide in contact with the molecules of the sensitiser, and they are consequently thrown into such violent agitation that they split up and yield a latent or developable image. According to Abney, the dye used as a sensitiser is first oxidised, and the oxidation product and the developer together reduce the silver bromide and so produce an image.

Experiments that I have made show that with all the ordinary sensitisers, whether added to the emulsion or applied in a bath, the orthochromatic effect is produced, or, in other words, the less refrangible rays act on the plates, even when the plates are exposed whilst immersed in strongly reducing solutions, such as a solution of sodium sulphite containing pyrogallol and a small quantity of alkali. It is inconceivable that any intermediate oxidation of the dye should take place under these conditions, and it follows that Abney's hypothesis is not tenable. On the other hand, the alternative hypothesis is only an hypothesis, and the precise mechanism of the action of the sensitiser is still unknown to us.

Another point of interest is the question of the relation between the maximum absorption of the sensitising dyes and the position in the spectrum of the maximum action of the less refrangible rays. A series of long and careful experiments some time ago led Eder to the conclusions: firstly, that the maximum *absorption* of the dye in a simple gelatine film does not coincide with maximum absorption of dyed silver bromide; and, secondly, that, although the position of maximum photographic effect of the less refrangible rays is not coincident with the maximum absorption of dyed plain gelatine, it is coincident with the maximum absorption of *dyed silver bromide*. On the other hand, some later experiments by Dr. J. J. Acworth lead him to the conclusion that this coincidence is non-existent, and that the position of maximum photographic effect is somewhat nearer the red end of the spectrum than the maximum absorption, this result being in accordance with a theory of Wiedemann's.

Last year, in a communication to the Chemical Section of the British Association, I pointed out that, although Acworth's experiments lead to a number of interesting observations, they are, so far as their main conclusion is concerned, vitiated by a fundamental error. The method adopted was to add a definite quantity of dye to a definite quantity of emulsion of known composition. In most, if not all, cases, however, the quantity of dye added was much larger than could enter into intimate association with the silver bromide, and consequently there was an excess of dye, which was simply staining the gelatine. The absorption measured was, as a matter of fact (and this is readily seen on examination of Acworth's own tables), the absorption of *dyed gelatine*, and not of *dyed silver bromide*. Somewhat later Von Hubl made an exactly similar criticism. It follows that the accuracy of Eder's conclusions is, in reality, not disturbed by Acworth's results. It is, however, very doubtful whether the point can be quite definitely settled by experiment; at any rate, with our present means of observation, since the quantity of dye necessary to produce the maximum sensitising effect is so extremely small. A properly washed orthochromatic emulsion differs very little in colour from an ordinary emulsion. The point is one of considerable scientific interest, but at present it has no very direct bearing on immediate practical needs, and it is the chemical side of the problem that at present has the greater importance from the point of view of the discovery of new sensitisers.

A vote of thanks having been passed to Mr. Bothamley for his paper, Mr. F. W. Branson, of Leeds, who had a large collection of radiographic apparatus on view, gave a short discourse on Radiography. First, by means of a fluorescent screen, he showed a bullet in the hand of a youth who accidentally shot himself three weeks ago. The ball entered the centre of the palm, and was imbedded in the base of one of the fingers. Mr. Branson said that Edison had cabled, with reference to calcium tungstate, that the salt must be crystallised. He, on the contrary, preferred the material in an amorphous condition, and, when this was used as a substratum for a sensitive film, a radiograph might be taken in a twentieth of the usual time. For example, the bones of the human hand might be taken in a single second. Another new method of procedure described was one whereby a negative and several impressions on paper might be taken at the same time, merely by passing the X rays through a box containing at the base an ordinary photographic plate, and above it as many pieces of matt-surface bromide paper, according to the number of impressions required, the object to be radiographed being placed outside the box, so that the X rays might first pass through this, then through the papers, and finally through the surface of the negative. Thus, added Mr. Branson, all were developed together, all being equally exposed.

Mr. Branson illustrated his remarks with numerous experiments, high vacua tubes, fluorescent screens, &c.

Mr. A. Haddon, in the course of a few remarks, adverted to the desirability of varying the degree of vacuum of tubes on account of the varying opacity of bodies to the X rays. As to the suggestion of Mr. Branson, that the tungstate of calcium, prepared by double decomposition and heated, was in an amorphous state, Mr. Haddon pointed out that precipitated tungstate of calcium gave no effect of fluorescence, but when raised to a red heat became fluorescent. But it was not then amorphous.

A vote of thanks having been passed to Mr. Branson, slides illustrative of Ripon and Fountains Abbey were shown.

Friday, July 17.—Excursion to Fountains Abbey.

The most beautiful weather of the week was experienced on

Friday, and, in consequence, a large party set out very early in the morning for Ripon and Fountains Abbey.

The leaders were Mr. F. W. Bedford, Mr. Denison, and Mr. Bingley, Mr. C. Watson, of Ripon, being appointed as local guide. Conveyances from the Unicorn Hotel were in waiting at Ripon Railway Station, many of the party electing to drive direct to Studley and Fountains Abbey, where they were met by Mr. T. S. Mason (Lord Ripon's agent). "Meanwhile the smaller section of the party, with Mr. Watson, first visited the Cathedral, where, through the kindness of the Dean, opportunity was afforded of inspecting the architectural details as well as to take photographs of the edifice, both of the exterior and interior, from numerous points of advantage. They then went forward to Fountains Abbey, the adjacent picturesque grounds and the romantic valley of the Skell affording ample scope for camera work, full advantage being taken of all the facilities placed at the disposal of the visitors by Mr. Mason. In addition to the ruins of the fine Cistercian Monastery, a striking contrast was afforded in a visit to the splendidly decorated memorial church of St. Mary the Virgin in Studley Park, permission to take photographs from the interior being kindly given. The old mansion of Fountains Hall (Mr. Mason's residence) was almost viewed with interest."

Over 1230 exposures (chiefly on Fountains Abbey) were made, and it is safe to say that the day will not readily be forgotten—the delightful weather, the grandeur of the old ruin, and the beautiful scenery of the district creating a deep impression on the Conventioners.

At the evening meeting the following paper was read:—

PHOTOGRAPHY AT THE SEASIDE.

By Frank Meadow Sutcliffe.

When I was asked to tell you something about photography at the seaside, it seemed to me that nothing could be easier; but, when I began to arrange my scattered thoughts, I found that I knew very little about seaside photography, except what I had done myself, and, as I, like every one else, have a most decided objection to be continually repeating the first person singular, I was for giving up the attempt, and for telling Mr. Pringle that the thing could not be done, when a friend, whom I will call Peter, came to my aid; so, instead of telling you about my own experiences, I will tell you of Peter's; it will relieve me considerably, and it will not hurt Peter. If you think that Peter tells you too much about one particular place at the seaside, please put it down to his ignorance of other places, and not to Peter's prejudice. He says he is quite willing to believe that the sea washes the doorsteps of other towns than the one he lives in; but, unfortunately the anchor which fastens him to that particular bit of coast is too securely fastened in the sand, or, to be more accurate, in the mud, for him ever to hope to weigh it, and taste the delights of other climes, and acquire experience elsewhere.

Inland, the year is supposed to begin on the first of January, but at the seaside it begins with the season, which varies according to the situation of the town. At Whitby, for instance, the first of January is somewhere between the middle of June and the middle of July. By the end of the latter month every house is taken, not by photographers, but by an army of young and old, carrying spades and pails—to be sure, there are many photographers among them. If you look into some of the pails, you will find a Kodak inside.

One morning last August, Peter heard that a big ship was coming in. Nowadays a ship is a curiosity at Whitby—once the fifth port in the Kingdom. With the exception of a timber ship——that is a ship laden with timber—or two, and one laden with ice from Norway, ships pass us by on the other side of the Bell Buoy. Fetching ice to Whitby seems to be a piece of foolish extravagance, for geologists tell us that three glaciers met at Whitby in the olden times. Peter says he quite believes the geologists, and that he does not think the glaciers ever parted, and that, if the top soil was scraped off, the three old glaciers would be found there to-day. He proves his belief by the coldness of his feet.

Well, as I said, Peter heard that a big ship load of ice was coming in for the fish-packers, so he went along the pier with his camera in hope of getting a picture before the sails were taken in. There were three little visitor boys sitting on the pier rails, and, as he passed, they said, "*There's another!*" On hearing this, Peter turned back. He says he does not mind being compared to a ha'porth of soap after a day's washing, but he will not be called "another." When he was a boy at school, when one boy called another "another," there had to be a fight to prove that they were not another, but themselves.

Sometimes, after Peter has been out photographing, he often thinks he *is* "another," and not himself. You should know our harbour is rather muddy in places, and sometimes he is apt to forget all about the mud in his pursuit of pictures. Only when he goes home to breakfast, and finds the front door fast, and some one at the window, saying, "You will, perhaps, kindly go round to the back, and get some of the mud off your boots and clothes before you come in," and it dawns upon him that he is very unlike the man who went out of the front door an hour before.

Then, too, the salt water sometimes takes all the starch out of his linen. Maybe, the wind has been blowing pretty strong from the nor'-nor'-east for some days, and the sea has got up, and he fills his slides, and goes on to the pier in the hope of getting some breaking waves; but, unless he is very lucky, they will get him first. You see, he can never tell whether they will break out at sea, where the camera is pointed to, or come further in and break at the pier edge under his feet. If they do, it means no more photography that day, for one good splash will wet lens and shutter through and through, to say nothing of Peter's self. Maybe, his hat is taken away, and he feels decidedly like "another" as he goes home and tries to get the water out of his lens and camera. I—no, Peter—once heard of a man who was taken off his feet at the pier end, and who struck out, so great was the quantity of sea which came over.

Cameras are as common at the seaside as bicycles are inland. What becomes of all the plates exposed by the sea is a mystery as unfathomable as the sea itself. The number of cameras is only exceeded by the number of grains of sand on the shore, yet we may hunt many a photographic exhibition round and round in vain for any prints from all the plates exposed. Perhaps the workers do not take into account the extraordinary degree of light and the luminosity of the subjects near the sea. When it is possible to take drop-shutter pictures after sunset, one cannot help thinking that many plates must be wofully over-exposed. Peter says he saw a man one bright morning last summer with a camera take out his watch and slowly count one, two, three, four, five, six, seven seconds before he capped his lens on a subject which can any day be got with a quick-shutter exposure. He felt inclined to advise him to expose another plate, and give it the twentieth of a second, but he did not like to address a stranger, especially a stranger with such a beautiful set of apparatus.

Strange photographers are seldom as shy as Peter is; perhaps they are Conventioners, who, I understand, soon get the bloom of modesty and bashfulness rubbed off—as I have never been to a Convention, I cannot say. Well, Peter was going over Whitby Bridge one morning with his camera—the bridge, you must know, divides the old and beautiful from the new and ugly town—when he was accosted by a stranger with a camera, who told him that it was no use his going over there to the old town, there was nothing worth taking. Peter pretended to be much obliged for the information. The stranger further vouchsafed the information that he was waiting on the bridge for a boat load of naked boys, but could not make out why they were so long. Peter asked him what he wanted the naked boys for, and was told that they were to be turned into water rats, but Peter did not see how a boy could be turned into a water rat, so he went away ashamed of his ignorance. He heard afterwards that by some mistake the boat load of naked boys waited a full hour near another bridge for a photographer who never came.

Some people think it always ought to be bright, and clear, and sunny at the seaside, and, if all these conditions do not exist, that it is of no use unpacking the camera. Now, to Peter's mind, the great charm of the seaside is that the weather is always changing, and that there is always a certain degree of uncertainty as to what it is going to do next. You never find fishermen afflicted with that curse which is ruining our nation, the curse of gambling; the speculating on the wind and the weather is quite enough to keep interest alive. The whole town may be enveloped in a mist one minute, when suddenly a wind springs up, and all is changed. Besides, some of the most beautiful effects are only seen in bad weather; so, if you come to the seaside in bad weather, do not go to the railway people and ask for your money back because you cannot see the sea for fog. To be sure, it requires some little courage to set up your camera in a fog, for people who still think that bright sunshine and photography cannot exist apart look on any one who puts his head under a focussing cloth on a misty day as a kind of lunatic, or, at any rate, as one who does not know much about his own business. There was one man, he is dead now—I hope Peter's erratic way of trying to take photographs in all kinds of weather did not hasten his death—

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KEY TO THE CONVENTION GROUP TAKEN AT LEEDS, JULY 15, 1896.

1. H. P. Robinson (*President*).
2. Mrs. Robinson.
3. A. Haddon (*Ex-President*).
4. G. Mason (*Past President*).
5. C. Phipps Lucas.
6. A. Tate (*Belfast*).
7. J. Stuart (*Glasgow*).
8. J. Howson.
9. J. T. Sandell.
10. R. Stewart (*Elgin*).
11. A. Dodgson.
12. F. Bishop (*London*),
13. Alfred Ellis.
14. Lieut. Adair.
15. A. Naylor.
16. H. Denison (*Hon. Trea. Local Committee*).
17. J. H. Walker (*Chairman Local Com.*)
18. Godfrey Bingley (*Local Hon. Sec.*)
19. R. P. Drage (*Hon. Sec.*)
20. Mrs. McIver.
21. C. H. Bothamley (*Past President*).
22. J. Walker (*Maybole*).
23. A. Priogle (*Past President*).
24. J. Davis (*Lancaster*).
25. Mrs. Wellington.
26. Mrs. Davis.
27. F. P. Cembrano.
28.
29. Mrs. Cembrano.
30. C. Wioter (*London*).
31. J. Porritt.
32. E. Woodward.
33. A. L. Henderson.
34. A. F. Mowll.
35. F. A. Bridge.
36. Major Lysaght.
37. Thomas Bedding.
38.
39. W. W. Naunton.
40. Percy Lund.
41. S. Keith.
42. J. L. Lyell.
43. S. B. Webber.
44.
45. C. Watson (*Ripon*).
46. J. J. Briginshaw.
47. Allan Neild.
48. H. Sturmey.
49.
50. Mrs. Cox.
51.
52. J. Cox.
53. H. Snowden Ward.
54. Mrs. Snowden Ward.
55. Mrs. Stevenson.
56. Mrs. Hirst.
57. C. B. Keene.
58.
59. Watkinson (*Leeds*).
60. R. W. Savage.
61.
62.
63.
64. — Rosen.
65. — Langfier.
66. E. Marlow.
67. James Taylor.
68. A. Seaman.
69. A. W. Atkinson.
70. Mrs. Seaman.
71.
72. H. P. Atkinson.
73. A. Freke.
74.
75. H. M. Dennis.
76. Miss Hargreaves.
77.
78. E. R. Ashton.
79. J. Garbutt.
80.
81.
82. V. E. Smyth.
83. Miss Waite.
84. Miss Waite.
85.
86.
87. — Appleton (*Bradford*).
88. W. D. Welford.
89. T. A. Scotton.
90.
91. J. T. Garbutt.
92. H. F. Wigglesworth.
93. Dr. Thresh.
94. A. G. Lawson.
95. N. S. Kay.
96. — Kay.
97. W. Scorer (*Havant*).
98.
99.
100.
101. W. Booth.
102. S. Margerison.
103.
104. R. Fowler-Jones.
105. F. W. Williams.
106. M. J. Harding.
107. W. Crooke.
108. A. W. Westropp.
109.
110. J. Harrison.
111. B. A. Burrell.
112. T. Coates.
113. Miss K. Lulham.
114. Miss Lulham.
115. C. C. Vevers.
116. G. F. Powell.
117. P. R. Salmon.
118.
119.
120. Dr. Adcock (*Great Yarmouth*).
121. Newson (*Fakenham*).
122. T. Barnes.
123. — Snowden.
124. A. C. Baldwin.
125.
126. R. Fowler Jones, junr.
127. C. S. Baynton.
128. Harold Baker.
129. T. Fall.
130. Warwick Brookes.
131. T. Birtles.
132. F. W. Hindley.
133. E. J. Wall.
134. W. Taylor.
135.
136.



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who used to annoy him very much. He always wanted to know what Peter saw *there* which he thought worth taking, and was for ever telling him that there was too much haze, or that the light was too dull, or the sunlight too fitful, and he was always inviting Peter to go to his house to see some large photographs of Venice, which were wonderfully clear, which had only cost him tenpence a piece. He wanted to know why Peter could not take photographs like them, and why he seemed to care so little whether the distance was clear or not. Hundreds of people have the same notions about photography as this man had—if they do not express it in words, they do by their faces; so, if when you are at the seaside, and you wish to be considered a clever photographer by the populace, you will see that the sun is shining and the haze has gone before you venture out with the camera, but, if you wish for pictures to please yourself and three or four of your friends, you will take no notice of the weather, nor the wise people, but will stroll round, seeking for your prey in fine weather and in foul.

For more reasons than one it is not advisable to keep the head under the focussing cloth too long, especially if working on the beach with houses above, or an avalanche of empty mussel-shells, or something worse, may be shot from above on the top of the photographer and his camera, to the delight of all the small boys round about. Peter once knew a man who swam across the river at Kirkstall Abbey, whose landlady refused to let him in when he went home. Your landlady will have equal grounds for refusing you admission if you don't keep an eye open to see that none of the refuse, which you feed pigs on in towns, but which we throw into the sea to feed the fishes, is thrown over you and your focussing cloth. There are other dangers besides pigment to be met with at the seaside. There is the tide, which has a way of its own sometimes overlooked by strangers. Peter says he has had people come to his studio with sorrowful tales of the sea—how they have unpacked their cameras on a stone, quite out of the way of the water, but, on going for another slide soon after, have found everything quite wet. He has also heard of lenses being left on a rock, being covered by the tide, and never heard of again. There was an advertisement in our local weekly newspaper one summer which ran as follows:—"Lost, on the Scaur, part of the inside of a camera; so much reward," &c., but it did not state what part of the inside of the camera it was which was left behind. You might leave the *whole* of the inside of a camera on the moors or in the woods, and find it where you left it a month after, but a single night's tide will take not only the inside, but the outside too, of the heaviest camera clean away by next morning.

My friend Peter tells me that he often feels inclined, when he gets away from home into places where cameras are sold, to go into a shop and ask the shopman to be good enough to show him a seaside camera and legs, but he says he never has, for he knows it would be of no use. His ideal camera for the seaside is an ugly thing—it has no bellows, and is only a square box; it has no focussing rack, for when the wind is strong, it will rack in a camera with a rack as easily as winking; it has a rising front fastened with a screw, and it has not only a rising front but a falling front. Why camera-makers don't make the front to fall as well as to rise is odd. The ideal camera of my friend has the shutter near the plate, or, at any rate, behind the lens, for when the winds blows it plays the mischief with the speed of shutters, and sometimes makes them go very slowly when set to go very fast. And the legs are as heavy—no, much heavier—than the camera, without any joints or anything to stick when wet. A tripod for seaside work ought, says Peter, to be of the old-fashioned sort, without any machinery to go wrong and get out of order if sand gets into its joints. When working in wet sand, it is necessary to expose as quickly as possible after focussing, or the legs may settle down in the sand unequally.

Seaside photographers are often asked why they do not get more pictures of storms. Now, a photograph of a storm is one thing, and a painting of a storm is another. In the first place, the sky is seldom as black as painters make it, and the waves seldom as big—for, when the wind is blowing its hardest, it seems to flatten the sea down and keep it from knocking about. Then, those picturesque groupings of fisher-people are, I may safely say, never seen in real life. What you *do* see is a black mass of humanity sheltering as much as possible out of the wind. The force of the wind is seldom taken into account. You see people in paintings standing in places where nothing less than an elephant *could* stand! In fact, sometimes the only way of getting along is to go on your hands and knees. I have seen a man too proud to adopt this undignified method of progression twirled round and round, and thrown down on his face insensible. In a gale of wind one man can do nothing with a camera; even in a sheltered corner one man is wanted to hold on to the legs while the other looks after the plate and exposing. But worse than the force of the wind is its keenness. On our coast we only get rough seas when the wind is north-easterly. Standing beside the camera when a piercing wind is blowing is often more than a joke. I have felt the wind go through my coat, and cut my arm like a knife. Sometimes, after waiting, maybe, for a gleam of light for half an hour, the photographer finds his hands so benumbed that he has lost the power of using them, and, do what he will, he cannot even take hold of his camera legs to take it away, much less take his camera down and pack it up. One feels very stupid to have to ask a passer-by to be good enough to take up the camera, and carry it along till the blood, like melted lead, begins to flow again.

Not the least picturesque part of the seaside are the inhabitants thereof, especially the fishermen. Their distinctive dress of sou'-wester, guernsey, and sea boots would be worth taking alone; but, when you have besides a handsome, open, bronzed face, absolutely without guile or deceit of any kind, the photographer, and not the model, will be at fault if the photograph turns out a failure.

If not so bronzed as the men, the women are certainly more brazen-faced, and will sometimes demand half-a-crown from a strange photographer before they will stand to be taken. What with skeining mussels, baiting lines, mending nets, and feeding men and bairns, the women have little time to give a photographer, and he would be a mean fellow, indeed, who would run away with a good-looking woman's face in his camera and not want to pay for it. The amount of hard work these fishermen's wives and daughters undertake is marvellous. Let the photographer follow them when out flither-picking on the rocks, he will soon be wet through up to the waist; and then, when they have got their baskets and sacks full, let him climb with his apparatus—but a feather weight compared to the weight of their loads of flithers—with them up a cliff side, some 500 feet high, he will then think that the woman's work by daylight is even harder than the fisherman's toil and danger at sea by night.

I spoke a short time ago about photographers leaving their apparatus on the seashore. Peter reminds me of an adventure a friend of his had with a strange hand camera—a thing I know very little about. Though any one can photograph in the ordinary way with a decent-sized lens and camera, genius is necessary to manipulate a hand camera. I do not speak in jest, for I have been trying for some two years now to get a decent plate with a hand camera; so far I have got nothing which is not flat, thin, and foggy. There was a sale by auction at Whitby last year, and among the things on the table in the auction-room was a hand camera. Peter's friend, who had been looking round, took it up and examined it carefully. He was rather surprised to find it there among a lot of old odds and ends, for it was in perfect condition—the lens and shutter were of the most improved make—in fact, Peter's friend made up his mind to come to the sale, and had visions of seeing that camera knocked down to him for five or six shillings. The only part about it he could not understand was the changing arrangement, so he took the back off and emptied the plates, which were inside, out while he made himself master of the mechanism. This accomplished, he had just put the plates back in their place, and was putting the camera down on the table, when a stranger came up, who said abruptly, "What are you doing with that?" "Just been having a look at it" Then the stranger turned very red, and began to splutter, "How dare you touch what does not belong to you?" The photographer replied calmly that he expected everything which was in the sale-room could be examined, and that was why they were on view. Then the man turned redder than before, and said, "You did not open it, did you?" "Of course I did," came the answer. Then, when the stranger walked off, muttering and cursing, with the camera under his arm, it dawned upon Peter's friend that the camera was *not* for sale, and that by examining the changing appliance he had exposed to light the whole of some one's day's work. Peter says his friend rushed after the stranger and offered to buy new plates, and said how sorry he was, but the man with the hand camera refused to be comforted, and went down the stairs using language which Peter cautioned me not to repeat, except on board ship or in a windy corner.

After all, photography at the seaside is like photography everywhere else—if we get more than our share of stormy weather, so that our trees give up as hopeless the attempt of trying to grow before they are many years old, those very same winds bring compensation in the shape of fresh air, which enables the photographer to work eighteen hours out of the twenty-four without feeling as weary as he would with the regulation eight hours inland.

If Leeds was only at the seaside, one thing is quite certain—she would be troubled with smoke no longer, the sea breezes would blow it all away, if they did not blow all the chimneys down; but,

then, Leeds would not be Leeds without its smoke, and Yorkshire without Leeds would be nowhere, and England without Yorkshire would be nowhere, and the world without England might just as well give up the trouble of turning on its axis, so it is just as well that Leeds is not at the seaside, after all.

I am afraid the impressions I have given you of photography at the seaside have been very indistinct, very much out of focus. May I, in conclusion, suggest that you should all go to the seaside, and get your *own* impressions? After such a hard week's work as you must have had this week, I am sure a change of air and a little rest and quiet would just set you up, or, as we say at Whitby, would just "trim" you.

In reply to Mr. Addyman, Mr. Sutcliffe said the light at the seaside was much more actinic than inland on account of the absence of smoke. The exposures were reduced to about one-fourth of those given inland.

A vote of thanks having been passed to Mr. Sutcliffe, a series of slides illustrative of beautiful places in Yorkshire, not placed on the week's programme, was next shown.

The Council Meeting.

A Council Meeting followed. Mr. F. P. Cembrano was proposed as President for the year 1897–8 by Mr. C. P. Lucas. Mr. George Mason seconded, Mr. Sturmey supported, the nomination, and, on a vote being taken, Mr. Cembrano was declared unanimously elected.

A vote of thanks was also passed to the local Committee and duly acknowledged.

Mr. Drage intimated that he would be unable to continue the secretaryship, but was induced to adhere to the office *pro tem.* Several members of Council thought that by the engagement of a paid assistant the duties of the Secretary would be so lightened that he would be willing to retain his position.

Subsequently the principal members of the Convention met at a smoking concert, organized by the officers and committee of the Leeds Camera Club, in the Green Dragon Hotel. The Chairman was Mr. J. Green Hirst (President), and the Vice-Chairman, Mr. W. A. M. Brown (Vice-president). To the latter gentleman the company, which numbered several hundreds, were indebted for the evening's hospitality, for which he was cordially thanked by those present. Songs, recitations, and instrumental solos constituted the larger portion of the programme, and there were also several appropriate toasts. A number of professional *artistes* from the Princess's Palace appeared. The pianist was Mr. W. McMillan. The hearty good welcome of the Leeds Camera Club was thoroughly appreciated by the visitors.

The week ended by the visit to Knaresborough on Saturday of about twenty-four members of the Convention.

"COSMOS" AT THE CONVENTION.

Between the hours of one and three o'clock on Sunday afternoon, July 12, Kirkstall Abbey, near Leeds, was almost entirely given over to the occupation of the writer of these lines. Provided with pencil and note-book, I sat where the great high altar once stood, and the only interruption I suffered in my imaginative efforts to people the ruined and restored Cistercian abbey with the monks of the olden time—to call back the glitter, the glory, and the dim religious light that once filled its stately aisles and transepts—came from a colony of quarrelsome birds that had found lodgment in its walls. I shall not soon forget that pleasant and lonely hour, for, during an eventful busy week, it was at once the most peaceful and the only one to which I was able to lay undisputed claim.

You will infer from the foregoing, dear reader, that the members of the Leeds Convention found plenty with which to occupy their time. Speaking for myself, and I believe for others, I can say that last week, for sheer, physical, hard work, would be difficult to beat in the ordinary way—that is in a week devoted to the pursuit of one's usual avocation. As an idea of what we went through, I give the tale of [my own] Friday's proceedings: Called at 6.30; 7.50 train to Ripon. Drove to Fountains Abbey. Five hours photographing and being photographed. Walked and drove back to Ripon. Lunch at 4.30. Train back to Leeds at 6.20. Arrived at 7.45. Meeting 8.30 to 10.30. Smoking concert till midnight. Then a visit to ——— But that, besides being another story, was not on the programme; so we will let it pass.

For all that, the week was enjoyable as well as bustling. They are good men of business at Leeds; and so things went without a hitch. The reception in the beautiful and well-filled picture galleries delighted the ladies, and gave them and the men the opportunity of looking their best. The civic dignitaries were affability itself, and the Deputy-Mayor (Mr. J. Gordon) pleasantly talked photography without boring us, or betraying signs that he had crammed up the article on photography in the *Encyclopædia Britannica* for his speech. The President's address gave ninety-nine out of a hundred Conventioners the opportunity of disagreeing with him, and so the week commenced in a most promising way.

Of the papers read, that delivered by Mr. Haddon, on *The Fixing and Washing of Paper Prints*, was the one that met with the greatest amount of attention. It was highly appreciated by all who heard it, as being full of sound, useful information on the subject. It was listened to with marked interest, and evoked a good discussion. One such paper, which appeals to every photographer, is sufficient to redeem a Convention meeting from the charge of doing nothing for photography. We all, or most of us, fix and wash silver prints; few of us do it properly, and Mr. Haddon tells us how it should be done. He hints at pursuing the subject, and I may therefore remind him that the Convention possesses a Research Fund of which he should take advantage.

Some fifteen or sixteen years ago a friend and I were having a humble tintype photograph of ourselves taken by the aid of magnesium, and when the operator had replaced the cap I ventured to suggest to him that the use of gelatine dry plates, which were then making headway, would enable him to shorten his exposures. Regarding me with an expression of savage contempt, he intimated, in emphatic but utterly unprintable language, that in his experience those people who knew something of photography always made the worst sitters, and he expressed bitterly ironical surprise that they condescended to be photographed by anybody but themselves. The moral of this has never been lost to me, and the incident rose in my mind on Wednesday morning of last week, when Mr. McIver, of Leeds, was taking the Convention group at the rear of the Yorkshire College.

The light was dull, the wind was blowing hard, the focussing cloths swirled and waved, one or two members thought they knew better than the photographer where they should stand, and, when the first exposure was made, somebody loudly and confidently expressed the opinion that it was underdone. Then one of the cameras appeared to be not quite level, and somebody else obligingly informed the photographer of the fact. The reply of Mr. Sellman of Huddersfield, who was assisting Mr. McIver, was simply, "Would you like to come and look for yourself?" and, not wishing to be out of the group, the interrupter was silent. Other very photographic criticisms were met by the stern request, emanating from some sensible photographer in the crowd, to "give the man a chance!" and at last the chance was given. Notwithstanding all these obstacles, a really admirable group resulted, a fact upon which Mr. McIver is to be congratulated. The background is not very picturesque, but the group contains 136 very good portraits.

The 136 members that figure in the group form considerably less than half of the total number that attended the Convention; this fact deserves mention as otherwise an erroneous idea might be formed of the attendance. Hard work, occasionally punctuated by pleasure, was the distinguishing feature of the week. Observation would lead me to think that there was far less than hitherto of that silly snap-shotting of one another in positions which, when the slides

are publicly shown, are calculated to raise a laugh or provoke ridicule. Bolton Abbey, the woods, and the river; York with its Minster, gates, walls, and other old buildings; Ripon Cathedral, Studley Royal, with the incomparably beautiful ruins of Fountains Abbey, gave opportunities for careful and well-considered work that were taken full advantage of. A crop of good results may assuredly be looked for, as the weather on the occasions named left nothing to be desired. Messrs. Watkinson's portable dark room, which accompanied us on our travels, was largely used, and a word of thanks is distinctly due the firm for its thoughtfulness.

The humours of a Convention meeting would provide matter for an entertaining book. I have only space and time for the narration of one, which gave a deal of innocent pleasure to all who figured in it. On the Thursday afternoon, in St. Mary's Abbey, York, a party of about a dozen, headed by the President, had gathered together. It occurred to somebody to have a group taken, which was done by means of a pocket Kodak. Then a member with a quarter-plate was pressed into service, and so we passed to 5×4, $6\frac{1}{2}\times4\frac{3}{4}$, $7\frac{1}{2}\times5$, $8\frac{1}{2}\times6\frac{1}{2}$, and ultimately to $9\frac{1}{2}\times6\frac{1}{2}$. In all, about ten separate photographers were cajoled, forced, bullied, or inveigled into exposing on the Presidential group, under the inducement of obliging Mr. Robinson, helping trade, immortalising themselves, and giving one of the party an opportunity of showing how a group *should* be taken. The confidence, the nervousness, the astonishment, the self-deprecation, the reluctance of more than one of those who were called upon to photograph groups in which such photographic notabilities as Robinson, Lange, E. R. Ashton, and others figured was most amusing to contemplate. The triumph of the afternoon was reached when two ladies were persuaded to take the group, which they did in a thoroughly cool and workmanlike manner.

The music of "broad Yorkshire;" the irrepressible animal spirits of the Leeds Camera Clubbers; the tact and distinction of Godfrey Bingley, Herbert Denison, W. J. Warren, and J. H. Walker, kept us company throughout, so that the proceedings never flagged. I have referred to the animal spirits of the Leeds Camera Club. They gave us a smoking concert one night, under the chairmanship of their President, Mr. J. Green Hirst, and the determined manner in which they set about the business of enjoying themselves and ministering to the comfort of their guests not only astonished the languid London contingent, but filled us with envy. Yorkshire folk do not appear to know what rest, repose, or sleep, means. They work hard; they play hard; and they seem to be always doing one or the other.

Some former Conventioners, such as Watmough Webster, Mr. and Mrs. Werner, Thomas Mayne, Hepworth, J. A. C. Ruthven, Child Bayley, and Mrs. Mason, were missed, but some interesting new blood put in an appearance. The late J. Traill Taylor—to whom the Convention, in its early days, owed so much—was not forgotten, as was evidenced by the vote of twenty guineas to the fund now being raised to provide a memorial to him. This was the right and proper thing to do, and the applause with which the suggestion was greeted indicated that his name will long find a warm place in the hearts of his former colleagues.

To the tale that is told elsewhere I have little more to add, except that Mr. Drage was, as usual, absolutely unselfish and tireless in ministering to the wants and wishes of the Conventioners. He was wholly unsparing of himself, and if ever a man toiled hard for other people, and met with success in his single-minded efforts, that man was Drage. With the assistance that he is entitled to receive, it is to be hoped that he will guide the Convention for many years to come.

To sum up, the Leeds Convention was an all-round success. Everything was of the best; the attendance, the papers, the weather, the places visited, the harmony, and the dinner; while good fellowship reigned throughout. At the beginning of the week a little cloud appeared on the horizon, but the wind changed, the sun burst forth, and the rest of the week was bright and fair. And so good-bye to grimy, smoky, noisy, bustling Leeds, and the enjoyable, earnest, thoroughgoing Convention of 1896.

The last four non-Leeds Conventioners remaining in the town on Saturday afternoon made their way to the 5.30 express for London, pleased and tired with their week's experiences. When the train started, one of them softly removed his Convention badge from the lappel of his coat. "Is the Convention ended?" asked a second, in a tone of voice expressive of surprise at the rapidity with which the week had gone. The others nodded, silently and somewhat sadly, and then the mighty express sped on its way south. COSMOS.

ON THINGS IN GENERAL.

I HAVE been considerably interested of late in scanning The Inquirer columns of this JOURNAL and have come to the conclusion that they meet a long-felt want, and, though I do not go to the extent of saying that no photographic home is complete without them, I do think they will be found very useful to a large number of readers. I must, however, say that the very least compliment that could be paid to those who reply would be to read the replies before asking for further information. I am led to make this remark by the query of "Billericay," who wishes to know if it is a fact, as asserted last week, that an insoluble chromate of silver is formed by the action of bichromate of potash on carbonate of silver. He goes on to show that his experience is contrary to the substantiation of such fact. Now, if "Billericay" will only go to the trouble of reperusing the replies on this subject, he will find that the exact converse of his alleged fact is set down.

With regard to "Perplexed" and others writing about iodine in solution there is all the necessary information for practical purposes, but not a definite explanation of his original difficulty. The truth is, the "tincture of iodine" of the pharmaceutist is not a simple spirituous solution of iodine, but a solution made by the addition of iodide of potassium to the extent of fifty per cent. by weight of the iodide employed. It is the presence of this potassium salt that prevents the precipitation when the tincture is added to water. When a solution of iodine is needed for stock—and it is a most desirable preparation in any photographic establishment—the simplest way to make it is to rub up some iodine in a mortar with a little water, and add a few crystals of iodide of potassium, and keep on stirring till the iodine is all dissolved, adding a further supply of crystals if necessary. This is an invaluable solution for removing silver stains from the hands or linen. Apply the solution, followed by a solution of cyanide of potassium. Any silver stains, however old, will give way to this treatment, which may have to be given a second time if the stain be very strong or the iodine solution not strong enough.

The event of the week—the event of the year, I may say—is past and gone, and the Convention of 1896 is the most illustrious of any, if mere numbers count. What very mixed feelings our worthy President's address must have raised! but the genial way in which he trod on people's corns robbed it of all offence. When, in the early part of his address, the President repeated the *bon mot* of a camera club man, "What is photography?" he scored a point; but he rather gave himself away afterwards in his plea for pure photography, for, when any one fresh to the subject views the annual exposition of the works of the Linked Ring, What is photography? is the very question that arises in his mind. *C'est magnifique mais ce n'est pas la photographie*, if I may be pardoned the liberty I take with a celebrated saying. Mr. Robinson says, "In the science of photography we soon find, with Macbeth, that 'nothing is but what is not.'" An equally fair quotation could be made from the Brothers James and Horace Smith's inimitable parody, when Photography and the New Photography were compared and discussed in the dim seclusion of the Salon: "Nought is everything, everything is nought, and thinking is but waste of thought."

By the bye, why does our most esteemed photographic stalwart of the stalwarts appropriate the term "The New Photography" to the Salon and all its works? I have a very distinct recollection of

seeing an advertisement of a professional photographer—years before the genesis of the Salon, headed "The New Photography."

What a charming picture is drawn in the address of the "public rush for the quiet simplicity of those portraits which appear to be almost too simple to be art, but which are all art, that have been shown to you in the Salon." Unfortunately the rush for photographs is a thing of the past to most people, and to suggest that business would be improved by avoiding retouching is to suggest the arrival of the millennium and the sudden surcease of vanity. It is retouching, however degrading it may be—and too often it is a vile degradation—it is retouching that has kept professional portraiture alive, sad though it may be to state it. What became of the arch-priests of photographic purity when retouching became general? They either sank utterly, never to rise, or, after a brief struggle, frantically stuck to retouching as the only lifebuoy. Talk of Silvy as a specialist! there is nothing special in charging two guineas for forty *cartes-de visite*, and, in his day, little but *cartes* were asked for. He and Salomon were men of great artistic taste, which permeated and distinguished all their work. What greater specialist or worker of more artistic feeling than poor Rejländer? And what did he make out of it? The thing necessary above all to make photography a paying profession is business talent. Silvy had a happy combination of both, and he made it pay handsomely. Some of the most wretched samples of, what I suppose, must be called photography were sent out of his studio, and some of the most beautiful.

To make a good thing out of professional photography is very rare nowadays, and, notwithstanding the editorial dictum about small and moderate businesses, I feel no hesitation in saying that a man who takes, say, 500*l.* a year, working it entirely himself, with perhaps a young girl to be useful to see clients, will make a bigger income than one whose receipts are three times as much, with the concomitant necessary assistants, and larger premises, and general expenses. I have at this moment in my mind's eye the example of a photographer in one of the Channel Islands, not to be too precise. He is a splendid worker. He takes all his sitters himself; prints, tones, mounts, and despatches every print, and deems himself passing fortunate if he takes two sitters a day. That man's receipts are pure profit within twenty or thirty per cent., while the "pro." is an exceedingly lucky man if, with gross receipts of three times 500*l.*, his *profits* reach twenty or thirty per cent.

One of the meanest pieces of photographic sharp practice is that referred to in last week's Ex Cathedrâ, where a local photographer, in supplying a series of views for publication, calmly appropriates another photographer's work by copying it, and sending the copied print with the pirate's name as author. The editor speaks of the possibility of a jury accepting the probability of a coincidence accounting for two different pictures appearing alike. That is possible, for the ways of the juror are beyond account. Fortunately, however, there is another mode of procedure, which would give absolute and irrefragable proof. Let each of the two photographs be copied to an exactly similar size, and mounted as a stereoscopic slide, a deviation of a straw's breadth in the position of barrow, man, or broom, would be startlingly evident if the slide were viewed in a stereoscope. I present this suggestion to the injured original photographer.

It is satisfactory to see attention given to the question of fading again, by so eminent an authority and accurate experimentalist as Mr. Haddon; but I would commend to his notice the question of mounts. I have evidence which, to me, is amply sufficient that an immense amount of fading is due solely and wholly to some fault in the mounts (not the mounting); mounts, too, that have no right to be faulty, if their cost is to be any criterion. This is a question of the highest importance, and will force itself to the front eventually.

FREE LANCE.

DAVEY'S SYSTEM OF EMBOSSING PORTRAITS.

MR. WILLIAM DAVEY, of 66, Truro-road, Wood Green, describes this invention (a communication to him by Frank Davey, of 121, Post-street, San Francisco, photographer).

It has for its object to increase the lifelike appearance of photographic portraits by embossing the parts of the print corresponding to the features, figure, dress, and accessories, in bas-relief, so that the effect of the photographic high lights, half-tones, and shadows will be enhanced by actual modelling of the surface of the photograph.

"In order to emboss a portrait, I either produce directly upon a suitably prepared wood block a photographic print from a transparency which has been made from the same negative as the print to be embossed, or I transfer to the wood block a collodion film or a single transfer carbon print, or a thin gelatine film, or a traced outline from the same negative or from a print produced from the same negative, the object, in any case, being to produce upon the block a more or less perfect outline of the portions of the portrait to be embossed, the relative position of the parts being reversed, as regards right and left, to serve as a guide to the carver in the subsequent operation. I then carve the wood-block so as to produce an approximately correct counterpart in intaglio (reversed as regards right and left) of the features and other portions of the picture to be embossed, the depth of the carving being approximately proportional to the natural relief and rotundity of the parts of the subject represented.

"The photograph print to be embossed, having been mounted upon a thick soft paper which will adapt itself readily to the die and permit of embossing in relief without splitting, is generally damped before being embossed, especially if the relief is to be considerable, except in the case of carbon and gelatine prints, which would be liable to adhere to the die if damped, and must therefore be embossed dry.

"The mounted print is then subjected to pressure, in a screw or other press, between the carved die and a soft rubber pad, or a counterpart in cameo, the face of the print being in contact with the intaglio die, and due precautions being taken to ensure correct register between the die and the photograph. With this object in view, I trace an outline from the negative and apply it in correct register to the die, and drive register pins through the tracing into the marginal portions of the die. I then remove the tracing and apply it in correct register to the print, and perforate the print through the holes in the tracing. The mounted and perforated print is then placed on the die, the pins coming through the perforations keeping the print in proper register.

"The counterpart in cameo may be an easily mouldable material such as paper pulp, or a pad of soft, elastic indiarubber which adapts itself to the configuration of the die at each pressure, and may serve for dies of different forms. In order to obtain a perfect impression of the die, the print may be first pressed with a soft pad, such as referred to, and then subjected to a second pressure between the same die and a counterpart formed of guttapercha which has previously received the impression of the die in the press. The print should be left under pressure for about ten minutes, or (especially if pressed dry) until it has permanently acquired the configuration of the die, and, after being removed from the press, it should be mounted in a deep *passe-partout*, or other frame, which will protect the relief surface of the print from injury. It is also preferable to back up the embossed parts of the print with cotton-wool, and to mount it on a stout cardboard backing."

The claims are:—

1. The described method of embossing photographic prints in relief by pressure between a correspondingly carved die and a suitable pad or counterpart.

2. A photographic print embossed or modelled in relief.

THE W. H. HARRISON FUND APPEAL.

Acknowledged a fortnight ago	100	1	0
Henry Perigal, Esq., M.R.I.	1	1	0
Washington Teasdale, Esq.	1	1	0
	£102	3	0

Further donations will be thankfully acknowledged by

FREDERICK H. VARLEY, 82, *Newington Green-road, London, N.*

Our Editorial Table.

RADIOGRAPHY AS AN AID TO DIAGNOSIS is the title of a pamphlet by Dr. Hall-Edwards, of Birmingham, in which the author, an ardent radiographic worker, quotes cases upon which radiography has thrown considerable light, and has aided the diagnosis. The pamphlet, which is reprinted from the *Birmingham Medical Review*, appeals to surgeons, who, doubtless, will appreciate it, as it is replete with useful suggestions.

MARION'S CATALOGUE FOR PROFESSIONAL PHOTOGRAPHERS.

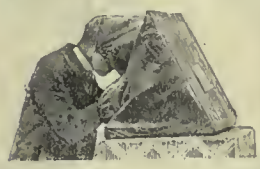
Marion & Co., Soho-square, W.

THE section of Messrs. Marion's catalogue which contains particulars of goods primarily intended for the use of professional photographers is before us. Accessories in great variety, backgrounds, show-cases, mounts, show-screens, and numerous other requirements of the professional man are described and illustrated in the course of a hundred pages. It is a well-got-up volume.

The Simplex Changing and Developing Tent.

F. Beaesford, 14, Bridge-road West, Battersea.

Mr. Beresford has shown us his latest production — a tent, primarily intended for developing on emergency, but also capable of being used for changing purposes. Two metal uprights and a cross piece support the fabric, which is secured by stout elastic to the bottom of the box, forming the base, so that no light can enter.



There are large holes for the arms, and an elastically bound face hole fitting just beneath the nose, and so allowing one to breathe freely. When set up, the tent is nineteen inches high, and gives a working space of twenty-two inches by sixteen. Folded up in its box, the measurements are eleven by sixteen by three inches. Three thicknesses of material are used, and perfect light-tightness should therefore be obtained. The Simplex struck us as being a useful and practicable tent.

The Roman Ruins at Darenth.

Mr. J. H. Baldock, of the Croydon Microscopical and Natural History Society, has kindly sent us two photographs of the Old Roman Villa at Darenth, which he took on the occasion of the Society's photographic outing there a few days ago. The photographs are excellent.

Photo-autocopyist Specimens.

The Autocopyist Company, 72, London-wall, E.C.

We have received from the Autocopyist Company some specimens of collotype printing done on the simple hand-worked apparatus that has been frequently described in these pages. Appropriately enough, having regard to the Leeds Convention, one of the views is of Kirkstall Abbey before its "restoration." This and the remainder of the specimens are remarkably good examples of this simple system of ink printing, which deserves to achieve wide popularity by means of the Photo-autocopyist. Rough surfaces and variously coloured inks are employed with equally happy effects.

News and Notes.

Paper for Photooraphic Purposes.—Mr. F. F. Weeks writes: "*Re* answer to correspondent, T. Coombs, page 464, I note your answer. But why not an English firm start making a special paper of A1 quality and various grades for photographic purposes? Surely there is a big opening for such a line. We have some famous British paper-making firms; it ought to be worth their while to make the trial."

Errata.—Owing to absence from home at the time of publication of our last issue, some errors escaped notice until too late for correction. In the last paragraph of leaderettes on page 452, last line but one, "controverts" should read "corroborates," which exactly reverses the meaning; but, as we have for many years consistently condemned "eliminators," we have little doubt from the context most of our readers will have recognised the mistake. Mr. Bothamley is made to speak of Mr. Haddon's four "pages"; "papers" was meant, of course.

Practicable Application of Acetylene.—At a garden party held on Saturday, the 11th inst., at Camberwell, S.E., the lawn was brilliantly illuminated by acetylene gas. The generators and fittings were supplied and fixed by Messrs. Thorn & Hoddle, inventors and manufacturers of the Incanto acetylene gas generators. This is, we believe, the first occasion on which this light has been applied in such a practical manner. The light was exceedingly brilliant, and illuminated the spacious lawn (on which dancing was being enjoyed by about five hundred persons) in a manner that would favourably compare with an elaborate electric-light installation.

For etching letters, names, or designs on metallic goods, such as knives, for instance, the *Zeit. f. Electrochem.* gives the following directions:—The objects are covered with the following mixture: 1 litre of naphtha, ½ kilogramme of carbon bisulphide, 2 kilogrammes of pulverised resin, and 1·5 kilogramme of chloride of copper. After covering with a thin layer of this, the stencil or type is washed with a weak solution of potash and pressed on the surface, which is then washed, after which it is wetted with a weak solution of sal ammoniac, through which a current is passed, which then etches the metal where the insulating coat has been removed.

On Saturday, July 11, the *employés* of Messrs. Penrose & Co., Upper Baker-street, W.C., the well-known manufacturers and dealers in process-work appliances, had their annual outing. The party, numbering twenty-five, proceeded by train to Hampton Court, and thence by steam launch up the river to Chertsey, where luncheon was served. Mr. A. W. Penrose presided, and, in responding to expressions of goodwill and thanks from the staff, said he fully hoped to see double the number around him next year. Cricket and boating were afterwards indulged in, and the party, having partaken of tea, started about seven o'clock on the return journey, which was beguiled by some excellent songs and music from various members of the staff

An Optical Illusion.—While doing some photographic work with a light from a Welsbach burner, which shone through a small ground-glass window in a dark room, I noticed that, when a lamp emitting red rays from its vertical sides was placed in a position so that its top was illuminated by the white light from the window, and while in this light it was then moved by hand to and fro in a horizontal plane, the top appeared to be loose, or displaced in opposite directions to the red sides. The top was of bright tin, and its surface sufficiently irregular to cast slight shadows, which rendered the effect very marked. This illusion is, no doubt, due to a physiological action at the retina, in which the impression produced by the white or grey light persists longer than that from the red, causing an apparent lag of the top. The persistency may be still further accounted for when the fact is borne in mind that the lag could only be obtained with weak lights in a dark room, and therefore with the pupil of the eye largely expanded, and in consequence a relative increase of intensity of the white over the red light upon retinal areas of different sensibility. Lamplight or daylight can be used instead of a Welsbach. I found it convenient to vary the intensity and colour of the lights by superposing sheets of coloured tissue papers.—F. H. Loring in *Nature*.

The Commercial Value of Applied Chemistry. — Professor Dewar's recent lecture at the Royal Institution was a rapid survey of the galloping pace at which chemical discovery of value in the arts has lately proceeded, says the *Chronicle*. It was a complete justification of Mr. Ludwig Mond's dictum, that chemical research spells commercial success. Take, for instance, what Mr. Mond himself has brought to light and utilised, all through his attempts to improve the gas battery first invented by Lord Justice Grove. Why cannot we turn coal directly into electricity without the cumbrous boiler, steam engine, and dynamo process interveniug—burn it up as you burn up zinc in a galvanic battery? Well, the idea is very magnificent, but not yet within the range of practical science. But the suggestion that carbonic oxide might be used in some way led Mr. Mond to discover a strange and totally unexpected property of this gas, namely, that it will directly unite with metallic iron and nickel to form gases which are called carbonyls of these metals. Could anything be more strange than the idea of iron as gas at an ordinary temperature? And could anything be more valuable, for, as soon as you heat these carbonyls, they give out the metal again with the greatest facility? The result is, that Mr. Mond is now using carbonic oxide to extract nickel from its ores. He gets nickel carbonyl as a gas, subsequently heats it to make it part with its nickel, and sends back the carbonic oxide to extract some more. In this way pure nickel can be obtained, for the gas will only pick up the nickel. Professor Dewar also described the famous Castner process for getting pure soda from common salt. Here we have electrolysis at work once more, but with a movable electrode in the shape of a flowing stream of mercury, which bears away the metallic sodium in amalgamic solution as fast as it is separated from the salt. The amalgam then passes into water, where the sodium dissolves as hydrate, leaving the mercury free to go round again. But there is something more than this. As the sodium dissolves, it generates electricity. Formerly this electricity was generated in the electrolytic bath itself, and obstructed the operating current by setting up a "back current" on its own account. Now, the "back current," being separately generated, is made to travel the right way, and supplement instead of obstructing the working current. Finally, Professor Dewar illustrated the discovery of the effect of the oxides of the rare earths, such as those of zirconium, thorium, and lanthanum, in transforming heat into light. This is the principle of the incandescent gas burners. The now familiar mantle, which is suspended in an atmospheric or Bunsen burner, and glows so brilliantly, is made, as Professor Dewar showed, by saturating a cotton mantle with salts of these metals and then incinerating it. The organic cotton is all burned away, leaving nothing but a skeleton mantle of oxides and silica. When these are suspended in the colourless gas flame, they glow in the brilliant fashion now so familiar, far surpassing the incandescence which can be obtained from platinum, magnesium, lime, and other substances heated to the same point.

National Association of Professional Photographers.—The summer meeting of the N.A.P.P. was held this year in connexion with the Photographic Convention, Leeds. The Association attended the reception by the Mayor of Leeds in the City Art Gallery, and all the various excursions, meetings, dinner, &c, with loyal devotion to their "badges" as members of the 1896 Photographic Convention. The business meeting during Convention week was held at the Imperial Hotel, Leeds, headquarters, as on the previous occasion of the N.A.P.P. Mr. Barry (Hull), President, in the chair. Amongst those present were Messrs. T. Fall (London), Harold Baker (Birmingham), J. Davis (Lancaster), Boak (Driffield), E. J. Walker (Maybole, Ayrshire), Priestley (Egremont), Eddison (Leeds), Crosby (Rotherham), Freke (Cardiff), and R. Stewart (Elgin, N.B.). Amongst other professionals who joined in the Convention were Messrs. Warwick Brookes (Manchester), W. Crooke (Edinborough), J. Stuart (Glasgow), and T. Birtles (Warrington). The Hon. Secretary, Mr. T. Bromwich (Kidderminster) was absent through illness. Letters of apology for non-attendance were received from nearly fifty members of the N.A.P.P., all expressing extreme regret at being unable for various reasons to be present, and wishing their professional brethren "a good time and good weather." The annual report referred to the very pleasant summer meeting held last year at Matlock, and the special courtesies extended to the N.A.P.P. by His Grace the Duke of Devonshire when visiting Chatsworth House. Over 100 professional members are enrolled on the books of the Association, and it is in the happy position of having funds in hand. Messrs. Charles Speight (Kettering) and E. J. Walker (Maybole, Ayrshire) were elected as new members. Some resignations were reported. Mr. Harold Baker (Birmingham) submitted some skilful photogravures, of his own production, which are intended to illustrate a work he is preparing upon the Avon district and Shakespeare's land. Mr. T. Fall (London) gave the brethren a treat, by showing some of his inimitable photographs of dogs—as he said, with his Yorkshire humour, he was only a poor photographer, and had nothing to show but photographs of dogs and donkeys. The announcement of the death of two old members of the N.A.P.P., Mr. Jesse Helloway (Cheltenham) and Mr. Adamson, sen. (Rothesay), was received with profound

regret. The usual dinner and London meeting had been held, November 9, at Anderton's Hotel, Fleet-street, at which the opinion was expressed that the past action of the N.A.P.P. had resulted in a very definite improvement in the terms allowed to professional photographers, and the publication of lists for the trade, and the trade only, where formerly no such lists were issued or even named. Mr. Hubert's proposal to amalgamate the Photographers' Benevolent with the N.A.P.P., had not received the approval of the Council. Referring to Mr. J. A. Draycott's suggestion as to professional photographers acting on the same lines as the Printsellers' Protection Association, it was considered that the circumstances and details of the two trades were so essentially different, as to prevent any action in the direction suggested. The Secretary (Mr. D. J. O'Neill, Birmingham) drew attention to the present unsatisfactory condition of the law of photographic copyright. Hope was expressed for a proper and authentic codification of the confused and conflicting legal enactments, which are a source rather of doubt and difficulty than of security and protection to the profession in many cases. The next meeting of the N.A.P.P. will be held on the Monday following the opening night of the Royal Photographic Society of Great Britain and Ireland, expected to be September 28.

Patent News.

The following applications for Patents were made between July 8 and July 15, 1896:—

Photographic Apparatus.—No. 14,972. "An improved Camera, Dark Slide, and Changing Bag for Photographic and other Sensitive Plates." M. Stephens.

Cameras.—No. 15,154. "Improvements in or appertaining to Photographic Cameras." J. Gage.

Screen Kinetoscopy.—No. 15,155. "An improved Chrono-photographic Apparatus or Motograph." Complete specification. J. Rous.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
27	North Middlesex	Demonstration on Sandell Plates. J. T. Sandell.
28	Birmingham Photo. Society	Excursion: Astley, South Warwickshire. Leader, W. Jones.
28	Hackney	*Intensification and Reduction.* E. J. Wall.
29	Oldham	Excursion: Rossett and Gresford. Leader, J. S. Dronsfield, J.P.
29	Photographic Club	The Management of a Photographic Society.
30	Birmingham Photo. Society	Last Day for Sending in Competition Pictures for June Excursions: Arbury, Compton Wynyates, and Stokesay.
30	London and Provincial	*Under-exposure, and How to Make the Most of It.* J. E. Hodd.
August.		
1	Borough Polytechnic	Excursion: Streatham and Beddington.
1	Darwen	Exc.: Hollinshead Hall and Rocky Brook District. Leader, Albert Almond.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

July 16,—Mr. T. E. Freshwater in the chair.

Mr. Edwin Banks was elected a member.

Mr. Ashby showed a photo-micrograph of a diatom magnified to about eight hundred diameters, the many different planes being very sharp. The objective used was of one-sixth inch power.

Mr. Bayston inquired what was an easy way of calculating the angle shown by any lens on a plate of a given size.

The Hon. Secretary referred Mr. Bayston to an article and tables of his on page 664 of The British Journal Photographic Almanac for 1894, which gave a very simple method, adopted by Professor Burton and the leading Continental authorities, and which was also the mathematical way of doing it. A 5½-inch lens on a 8½×6½ plate would include an angle of about 88°, that is when using the lens in the centre of the plate, but by shifting the lens to one side the angle is altered.

In a short discussion on the latest developments of the Röntgen-ray photography, the Chairman said he had found that those plates that were more sensitive to the X rays were also more sensitive to the photographic rays. He had failed in the use of a gelatine dry plate as a fluorescent screen, as suggested recently.

The Hon. Secretary said it had been shown that collodion plates which were not fluorescent were useless for radiography, while gelatine plates, which were fluorescent, were sensitive to the rays. He thought it would be interesting to know whether a more fluorescent gelatine would produce a more sensitive dry plate.

MANCHESTER PHOTOGRAPHIC SOCIETY.

On Saturday, the 11th inst., twenty-four members and friends assembled on London-road Station about 1.15. The event was the second outdoor meeting of the season, and the weather, like the last excursion, was perfect. The train left punctually at 1.30, landing the contingent about 2.15 at Chelford. After a short walk, a shady road was reached which led down to the church, which edifice being so surrounded by trees made it unphotographic. Turning to the right, and presenting our credentials at the lodge, we enter the park of Astle (permission being kindly granted by the owner, Colonel Dixon), where cameras were soon at work on the rush-lined shores of the mere. Nearing the hall, a refreshing sound of falling water tells us that we are near the waterfall, and several plates were exposed on it, seen through the arched bridge. About five o'clock the party collected together, and walked by lane and field to Nether Alderley, where tea was partaken of at the Eagle and Child Farm, after which those members who had the fortune to have some plates left, exposed on haymaking scenes, the church and rectory, and many other subjects. The usual group was taken in the churchyard, and, after a pleasant walk to Alderley, caught a most crowded train back to Manchester, arriving about ten o'clock.

North Middlesex Photographic Society.—July 13, Mr. Mattocks in the chair.—Mr. Milne gave a demonstration on

Venus Paper.

The lecturer began by passing round some prints, showing what could be done on the paper, the prints being of various grades of surface, from rough to smooth, and exhibiting a great range of colour. Mr. Milne then toned some prints in the Venus combined bath, which gave very pleasing brown tones, and also toned one to a platinum black by immersing it in th Company's No. 1 bath to a warm purple shade, which changed to black i the combined bath. He also toned some in a platinum and nitric acid bath which gave a pleasing warm brown tone. He recommended the addition of borax to the fixing bath:—hypo, 1 ounce; borax, ¼ ounce; water, 20 ounces. The prints toned in the combined bath required further fixing in this solution, as the action was very quick—about one minute is sufficient. Mr. Gosling asked if a partially printed proof could be developed up. Mr. Milne said Yes, and recommended hydroquinone. Several further questions were asked and replied to, and a vote of thanks passed to the lecturer.

South London Photographic Society.—The last meeting of this Society was devoted to a Beginners' Night, when the Hon. Secretary (Mr. Oakden) dealt with the subject of Cameras, their forms and accessories. After explaining the advantages of various cameras, he went into detail as to the uses of the various movements, and also as to how and when they should be utilised. Lenses and their different forms received their share of attention from the lecturer, who explained the advantages for certain purposes of some forms over the others. A camera stand should, above all things, be light, with sufficient rigidity to prevent the apparatus moving during exposure. A stand which was not rigid was a nuisance.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE CONVENTION OF 1896 AT LEEDS.

To the Editors.

Gentlemen,—The Leeds Convention is at an end, the treatment that has been meeted out to us by our Leeds friends will make the period of our stay in the district a not easily to be forgotten week.

First and foremost the President's address, and the valuable papers and demonstrations (attendances at which have been very large) have supplied us with ample food for our minds during the week.

We have had placed before us an inexhaustible stock of food for our cameras (considerably over 3000 plates and films, ranging up to the lordly 12×10 and 15×12, having been exposed during the three principal excursions), while the arrangement for food for our bodies have been practically faultless, owing to the care and forethought of the local Executive Committee.

There were 305 subscribers, 209 signing the attendance roll, a large increase on former numbers of Convention.

Mr. Godfrey Bingley, the local Hon. Secretary, on whom great responsibility has rested, and on whose labours the success of the Convention so largely depended, deserves the heartiest thanks of every member of Convention; may he long be enabled to devote his *special* gift of organization for the benefit of his fellows.

Our reception at the City Art Gallery will long be remembered by those who attended; and to Mr. Herbert Denison, the local Hon. Treasurer, we all owe our best thanks for his labours in arranging such a very pleasant function, and also to the other members of the local Executive committee, the Chairman of which, Mr. John Henry Walker, by his tact, urbanity, and good fellowship, has done much to make our visit to Leeds so very enjoyable.

At the annual general meeting the members decided to vote twenty guineas of the Convention funds towards the Traill Taylor Memorial Lectureship Scheme.

A very cordial invitation to make Great Yarmouth our centre for the meeting of 1897 was accepted unanimously.

Mr. F. P. Cembrano was elected President of the Convention for the year 1898.—I am, yours, &c., R. P. Drage, *Hon. Sec.* (*pro tem.*).

Photographic Convention of the United Kingdom.

VARIOUS SUGGESTIONS.

To the Editors.

Gentlemen,—Your valuable Journal is always received with thanks. I wrote to you some time ago to have an explanation in regard to a

certain kind of halation, but have had no answer as yet, and all parties I have shown it to were unable to explain. I therefore must give it up, for the time being at least. On June 12 last, in your Correspondence, Mr. Charles H. Hewitt refers to his way of using the air in developing a plate. This is not quite new, as it was known to me and to others, as I am not the discoverer, over fifteen years ago, and even now it is a great help to me. While developing the plate, I lift it out occasionally, and, while looking at it, I leave it in the air some time, when the intensity increases more rapidly than otherwise, while an occasional good rinsing under the tap hastens the development also. I have even found lately that a plate, when fully developed, intensifies somewhat when left, say, ten to fifteen minutes under the tap before fixing in hypo.

On June 19 last, page 385, "A Suggestion for Overcoming the Crackling Tendency," &c., is not quite new either, as the explanation of such a contrivance was given by me at some length in your ALMANAC of three or four years ago.

A few weeks ago one of your correspondents complained of the irregularity of the ready-sensitised paper. I have had some trouble in the same line, but not so much lately as formerly. If the paper is badly prepared (as I do not think the trouble lies in the paper itself), that is, in the albumen or in the silver bath generally in such cases too weak, the remedy is scarcely possible, except one is satisfied with a very light purple tone, but never a black tone can be approached. I have lately found, however, that the results can be improved in a very simple way. I must, however, at once say that the method I use seems not only childish, but almost ridiculous; but I give it to you for what it is worth, and it may be followed or not. I, for one, am satisfied with the results.

When about to tone (I use the bicarbonate of soda and gold bath), I prepare my bath about fifteen or twenty minutes beforehand. This time may be lengthened to one hour, but I don't like to shorten it. Now, if I make a toning bath of, say, sixteen ounces of water with proportions of bicarbonate and gold, to tone 100 10×8 inch prints, I may succeed in obtaining a good tone and rapid toning, but sometimes I do not. My proportion of very good results is more certain when I prepare the same necessary quantity of gold and bicarbonate in about three or four ounces of water; then let it rest as above, and add the required quantity of water just before using the bath. I cannot explain the why of it, but this is my experience.

I see also in one of the later numbers of THE BRITISH JOURNAL OF PHOTOGRAPHY parties finding that the bicycle harms the camera business. This may be so, but the camera man is to blame for a great part of this lack of interest. I have advised the manufacturers of cameras to devote some attention to the making of a light and compact folding camera, and then the bicyclist may carry one along, otherwise he will be apt to leave it at home. Of course, some manufacturers will say that they have such a one for sale, and that it is all that can be desired; but ten to one that, if he is a cyclist himself, he does not use his own instrument, and, if not a cyclist, he is no good judge. The camera, if carried at all, should be inside the frame, between the legs, and the tripod, if any, across the guide or steering. The cameras, as made now for such purpose, are too heavy, when complete, with rising front and swing back, &c., or too clumsy, or otherwise too flimsy to resist any shaking during the outing, and the wind, however slight, during exposure.

Give us a camera of 5×4 or 7×5 plates, strong, light compact, and complete, to fix inside the frame, and I dare say a ready sale will reward the manufacturer, as the instantaneous boxes are, however light, always clumsy, and, as long as one has to stop cycling to take any view, he may as well have a good one, and correctly exposed and focussed, to have a better result, specially for enlargements.—I am, yours, &c., A. LEVY.

Asnières, Seine, July 16, 1896.

DEVELOPING FORMULÆ.

To the EDITORS.

GENTLEMEN,—We are so heartily in accord with your views as to the unsuitability of many developing formulæ for the ultra-rapid plates of to-day, that we gladly welcome the leading article on the subject in your issue of the 10th instant.

When the great increase of speed of plates was attained, we at once found the grave risks which such speed involves in the matter of development, as so forcibly pointed out by you, and, after careful experiment, we decided to adhere strictly to our then developing formula—pyro soda—*which is perfectly safe to use with even such ultra-rapid plates as the Ilford Special Rapid series.*

Not only is this formula perfectly safe for these plates, but it is one that brings out all possible detail, and thus admits of the shortest possible exposures.

The risks arising from using our developing formula are therefore *nil*, but there remain the further risks due to the use of formulæ other than our own.

To draw attention to this matter, and to minimise the risks, we have, for some time, added the following warning on our Special Rapid labels:—

"Developing Formula.—Special Note.—For Ilford Special Rapid plates the following is the most suitable, and the only one we recommend."

—We are, yours, &c., THE BRITANNIA WORKS COMPANY, LIMITED.

Ilford, London, E., July 21, 1896.

DIRECT HALF-TONE NEGATIVES.

To the EDITORS.

GENTLEMEN,—Mr. W. Gamble, in his "Photo-mechanical Notes" in THE BRITISH JOURNAL OF PHOTOGRAPHY, of May 29, 1896, refers to taking direct half-tone negatives from life, and points out the great advantage it would have over the present mode of making half-tone negatives from prints, and the great saving in time for producing blocks for newspaper illustrations, &c.

I have given this matter my serious attention for a long time, and have at last succeeded in making what I may call direct half-tone negatives from life, snap-shots not excluded. I enclose a few copies of a negative produced by my process, so that you may judge for yourself. The copies are produced in collotype, as I have no convenience for making half-tone blocks.

I shall esteem it a favour if you will be good enough to put me in communication with Mr. Gamble, as I should like to see him on the subject, and hear his opinion.—Thanking you in anticipation, I am, yours, &c., E. FENSKE.

19, *Rockbourne-road, Forest-Hill, S.E., July* 20, 1896.

[The results our correspondent encloses are promising. In all probability this letter will come under the notice of Mr. W. Gamble, who will, doubtless, communicate with Mr. Fenske direct.—ED.]

MOVING PICTURES ON THE SCREEN.

To the EDITORS.

GENTLEMEN,—Referring to the paragraph in your issue of July 17, under the head of Ex Cathedrâ, in which your correspondent says, *apropos* of Mr. Friese-Greene's letter in last week's issue, that "every one seems to have entirely overlooked Muybridge in this connexion." Now, it appears to me that Muybridge's methods and results do not bear upon the present controversy at all. In the first place, I think you will find that his pictures were not taken with one camera, but with a series of cameras taking one picture each; consequently they were not taken upon a continuous travelling film, neither were they taken from one point of view—they were, in fact, a number of detached photographs upon glass. The pictures were afterwards printed, in series, upon a glass disc, which was made to revolve in a lantern, the result being a sort of modified zoetrope, in fact the only difference I can see between Muybridge's apparatus and the old "wheel of life" is that the pictures were shown on a screen instead of being viewed through a slot. The essence of Mr. Friese-Greene's invention consists in the taking of the pictures upon a continuous film, in *one* camera, and in projecting them, intermittently, from the same or similar apparatus upon a screen. The comical episode your correspondent refers to sufficiently fixes the difference of method and result, as it would be absolutely impossible to get a similar effect, or anything like it, from Mr. Friese-Greene's apparatus. I take it that Mr. Friese-Greene does not claim to be the inventor of the zoetrope, but of a camera for taking photographs upon a continuous band at a rapid rate, and of an apparatus for projecting them upon a screen so as to produce a lifelike effect, and his claim certainly appears to be unassailable.—I am, yours, &c. T. H. BETHELL.

Parliament Mansions, Westminster, July 20, 1896.

THE SALE OF PHOTOGRAPHIC BUSINESSES.

To the EDITORS.

GENTLEMEN,—Your leader in last week's JOURNAL, touching the purchase and sale of photographic businesses, is one that all professional photographers should be interested in, and, although it is admitted that no fast rule could be arranged for the disposal and purchase of all businesses alike, there are still many points that are general to any business and might, with advantage, be more carefully observed by both purchasers and vendors of businesses. I think one of the first inquiries a purchaser should make, and insist upon, is a *balance-sheet* of the business, showing the profit and loss of the undertaking for the past three years. It may be argued that photographers are proverbially bad bookkeepers, and that to make a balance-sheet would be a difficult matter in most cases, but I contend that a photographer, having anything to sell worth selling, would be consulting his own interests, as well as the purchaser's, by calling in a respectable accountant and having a sheet properly prepared, the cost of which certainly should not exceed one per cent. and the same would enable him to fix more accurately the value of his business. A second inquiry a purchaser should make, and again insist upon, is an inventory of the instruments, furniture &c., and an account of the stock in trade, and I think, fortified with these primary particulars, any man finding himself taken in with a business would have no one but himself to blame, and certainly would have no redress in a law court. Your remarks in reference to the caution required with regard to the lines a business has been run upon do not, to my mind, contain as much importance as would at first be impressed, unless the business is in a very small place, where the population is not actually growing; for I am under the impression that, where the town is large enough, you can no more exhaust the demand for photographs than you can that for clothes, boots, &c., for each year brings forward its rising generation, full of the same vanity as its predecessors. What must not be lost sight of by the

new proprietor of a business is resource within himself, an ability to adapt himself to his new surroundings and cultivate new ideas to attract the public, &c. Your remarks in reference to the employees of a new business not being "bound over to keep the peace" is a very pertinent one, and the purchaser of a business should partly base his valuation on the probability of such a breach taking place, particularly if he is paying anything for the goodwill of the business. In conclusion, I will also refrain from making any estimate of the valuation of businesses, but attention to the suggestions made above cannot fail to prevent disappointment where ordinary care is taken.—I am, yours, &c., NOSILLA.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Henry Dunning, Bridge-street, Usk, Monmouthshire.—*Photograph of Colonel Burton on horseback at brigade inspection.*

Edward Adolphus Tear, 5, Westgate-street, Ipswich.—*Photograph of Charles Barnard Westley, Champion of Suffolk, on bicycle.*

Debenham & Co., 5, Clifford-street, York.—*Photograph of the Lord Mayor of York, Mr. Alderman Milward, in robes and chain, three-quarter length profile. Photograph of the Lord Mayor of York (large head), Mr. Alderman Milward, in robes and chain.*

STRAINING.—N. B. (Burton-on-Trent. 1. Ordinary chamois leather. 2. Nainsook, as sold by all linendrapers.

THE RÖNTGEN RAYS AND CONSUMPTION.—H. R. SHARPLES. Your doctor was quite right; the X rays are not germicidal.

ONE OF OUR ADVERTISERS.—You omitted your name and address. We do not answer such questions as yours, viz., "What is the best hand camera?"

ADDRESS WANTED.—EDWARDS & SON write: "Will you kindly give us the address of Mr. H. P. Robinson, who wrote article *Photography as a Business* some time ago?"—In reply: Mr. Robinson's address is Winwood, Tunbridge Wells.

PROCESS BLOCKS.—P. MILLEN. Yes, process blocks could be produced with much finer screens than those generally used commercially, but you must have in mind that the finer the screen the greater is the care required in printing; also that these fine screens necessitate a better quality of paper and ink than are usually employed for commercial work.

THE EXHIBITIONS.—CHALKLEY, GOULD, & Co. write: "Would you kindly inform us through the medium of your paper the latest date for sending in photographs to the Royal Photographic Society's Exhibition in Piccadilly, and also for the Salon Photographic Exhibition, and oblige."—In reply: Our correspondents had better consult the JOURNAL for June 5 and 12. Dates and full particulars are given there.

PHOTOGRAPHING IN GREENWICH PARK.—R. J. DUBRIN says: "Will you please inform me to whom I am to apply for permission to photograph in Greenwich Park, &c.? I know you have made this known through the JOURNAL several times, but I cannot remember it now. Thanking you in anticipation."—In reply: Permission may be obtained from the Secretary of H.M. Office of Works, 12, Whitehall-place. We do not undertake to reply through the post.

UNEQUAL TIME IN SHUTTER.—CYCLIST. There is a very simple explanation of the discrepancies in the exposures, although the shutter was set at the same speed for all. You mention that you travelled on your bicycle fourteen miles to take the pictures, consequently particles of grit from the dusty roads got into the working parts of the shutter, and thus had an influence on its normal speed. That must always be the case with shutters of the type mentioned, unless they are carefully protected from dust when touring.

STUDIO AND BUSINESS.—Twenty-seven to thirty feet long, by twelve or thirteen feet wide, will be good proportions. The amount of glass, top and sides, will very much depend upon the aspect and the form of studio settled upon. We can give no idea of the cost, as the price of material and labour vary in different localities. Get out a plan of the building desired, and then ask local builders to estimate for the work. Any light business you are familiar with will go with photography, such as carving and gilding, stationery and printing, &c., if you are proficient in them.

PATENT.—S. G. writes as follows: "I have recently applied for a patent for an invention I have made, and a provisional protection has been granted me by the Patent Office, and I am now making the article. A friend, who professes to know more than, I think, he does, says I am not entitled to call the thing 'patent,' and that I am rendering myself liable to a penalty. Kindly give me your opinion."—Your friend is quite right. You have no patent, and, by saying you have, you incur a penalty. You may use the terms, "Patent applied for," "Provisionally protected," &c., but not "Patent."

NON-DELIVERY OF GOODS.—H. HUGHES says: "Will you kindly advise me what to do in the following? On May 29 I ordered and paid for a camera and slides of Messrs. ——, who advertised in your JOURNAL of that week. They informed me the camera and slides would be sent on the following week. On June 12 and 17 I wrote again, asking them to refund cash or forward the goods. To neither of the letters did they condescend to reply. I informed the Superintendent of Police in this district, and he has not heard anything. I see they are still in the land of the living, as they advertise elsewhere this week. How can I get camera and slides or my money back?"—In reply: A County Court summons would, no doubt, be your best course. We do not know the firm.

DUSTING-ON PROCESS.—T. HOMEWARD says: "I have been trying the powder process for the first time, and cannot get on at all with it. I have tried two of the formulæ given in the ALMANAC, but the result is the same with both, the powder will not take. My object is to make reversed negatives."—The failure may be due to two causes. First, over-exposure. If the print be over-exposed, the powder will not adhere. Second, the film too dry. Moisture plays an important part in the process, and the atmosphere has been very dry of late. Probably, supposing the plates were not over-exposed, if they had been developed in a damper atmosphere, the results would have been different. There are other causes of failure, but we have indicated the two chief ones in the direction mentioned.

PLATINOTYPE TROUBLES.—NEDDIG says: "If you could help me over the difficulty I am about to bring to your notice, you would be doing me a great favour. The print enclosed is a platinum, developed in the ordinary way with oxalate, and has had three acid baths, also sixteen changes in washing. The rubber backing was dried before using, and the frame kept indoors. You will notice the wretched yellow tone which appears, more or less, in every print we do. If you could give me any hints as to how the splendid blue-black tone is got by some people it would solve the mystery. I may add that I am a professional, and, as you may guess, my employer is far from satisfied with the platinums; so you will understand how any hints would help me. I have also tried Dr. Jacoby's platinum paper, with the same result."—So far as we can judge from the print sent, supposing that the manipulations were carried out in the usual way, moisture is the source of the trouble at some stage or other. Possibly the paper was not in good condition when received. Try another brand, or communicate with the makers of that in use.

DISCOLOURED PRINT.—J. B. C. says: "The enclosed print, which I should be obliged if you would return, is a curiosity, the mystery of which I should much like solved. It is on Eastman's permanent bromide, developed in metol and carbonate of soda, thoroughly washed, fixed in pure (recrystallised) hypo, about one pound in one hundred ounces, for twelve minutes, then washed one and a half hour in Wood's washer. I am not certain—I thought not—but I may have toned it about three minutes in uranium and prussiate of potass solution, and then washed fifteen minutes. I believe it was not toned, but, as I did several in the batch, can't be quite certain. I made the print last night, and this morning it was white; at one o'clock, as it leaves here, blue. The marks in the corners come from my shutting it in a book without noticing that they were still wet. It was exposed to the light all the morning."—In reply: We cannot tell the exact cause of the blue colouration, but in all probability it is due to the access of iron to the potassium ferridcyanide of the toning solution, which would result in the formation of a blue deposit, and the consequent discolouration of your print. Still, this is only a surmise on our part.

OVER-EXPOSURE AND CHLORIDE RESTRAINERS.—SHARP FOCUS says: "In your No. 1881, of Friday, May 22, I read an article on the above, by Mr. Matthew Wilson. Having some negatives which I know to have been considerably over-exposed, I applied to my dealer for the standard ferric-chloride solution mentioned by Mr. Wilson, and at the same time gave the article to him (dealer) to read. He tells me he would not advise me to try this method, as he is sure I have read the article wrongly, and that Mr. Wilson means the over-exposed plate to be developed first, then soaked in ferric chloride, and, lastly, redeveloped. I read the article to soak for five minutes in ferric chloride first, and then to develop. I should feel obliged if you would direct me on this point, as also how to make up the ferric chloride. I have also seen some other methods described, which, however, I forget at present, and in any case place more reliance on your paper than on others. It appears to me that such articles as Mr. Wilson's are of far greater importance and worth than all the trash that is published by 'Fuzzy Jones' to prove out-of-focus photographs better and more artistic than paintings. I enclose stamped addressed envelope for reply through post."—In reply: We do not undertake to reply through the post. You read the article aright. The author says he first soaks the plate in ferric chloride, and then develops. As to the method of preparing the standard ferric-chloride solution, if our correspondent will turn to the JOURNAL of April 10, he will find that the author of the article gives the necessary particulars.

*** Many communications stand over on account of pressure of Convention matter.

NOTICE.

With the JOURNAL *of this week we issue a half-tone illustration, by the Strand Engraving Company, representing some of the members of the Eleventh Annual Photographic Convention of the United Kingdom, assembled at Leeds on Wednesday, July* 15, 1896. *Mr. D. Melver, of Leeds, took the negative. A key, with the names of members, is also given; and, although it is unavoidably incomplete, we tender our thanks to the several gentlemen who assisted us to identify many of the members. We shall be glad to have the names, for publication next week, of those members who are not named in the key.*

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EX CATHEDRÂ.

Our contemporary and neighbour, the *Echo*, draws attention to the congested state of the market traffic in and about Covent Garden on certain mornings of the week, and hints at the terrible condition of things that would ensue on the outbreak of a fire in the locality when it is blocked by waggons, carts, horses, produce, &c. It asks for the opinions of, among others, the editors of papers published in the immediate district. We have no hesitation in observing that Covent Garden Market is a nuisance to the locality. In time to come we, or our descendants, will be smiling at the fact that in this year of grace, 1896, the greatest city in the world was content to put up with the numerous inconveniences of a small and shabby vegetable, fruit, and flower market, such as would disgrace a town not a tenth of the size of London. Covent Garden and its approaches on a market morning cry aloud for the photographer; for, without the irrefragable records of the lens and the dry plate, we fear that not only our descendants, but many people still living at home and abroad, would find it hard to believe that such a deplorable place as "Mud-salad Market" ever had an existence in fact.

The echoes of the Leeds Convention have hardly died away before we find ourselves instinctively looking ahead to the Great Yarmouth meeting of 1897. We are glad to observe that thus early the press of the interesting seaside town for which Nelson had so much affection is well disposed towards the Convention, and evinces every anxiety to make the visit a success. The *Yarmouth Mercury* takes a very practical view of the advantages likely to accrue to the town from the Convention meeting. It remarks: "The visit will not only be the means of bringing many strangers into our midst, but will also prove a huge advertisement, as photographs of the scenery of the locality will find their way into every part of the kingdom. As there are many thousands of the inhabitants of the British Isles who do not know of the charms of our town and broadland, it must inevitably follow that the subsequent exhibition of the views taken hereabouts will result in our reaping a rich harvest. Mr. Harvey-George informs me that some 500 members are likely to come here next July, and it is to be hoped that the Mayor and Corporation will render the Camera Club every possible assistance in entertaining the visitors, as the Mayors of other towns have done." The kindly spirit in which the Convention is thus regarded will assuredly not be lost on its many members.

* * *

Shakespeare's Town and Times is the title of a book by Mr. and Mrs. Snowden Ward that is to be published forthwith, and to which we shall shortly have an opportunity of further referring. From the synopsis of the contents we anticipate a readable and painstaking life of the "bard of all time." There are over 120 illustrations in the book, most of which are in half-tone from negatives made by Mrs. Ward. The subject and the admirable manner in which it appears to be treated should ensure the work wide appreciation and success. The world cannot tire of Shakespeare, and it is always ready to shower thanks on those who write of him, illustrate him, or act him earnestly and well.

* * *

The brief report of the National Association of Professional Photographers' meeting, held at Leeds in the Convention week, that appeared in our last number, is pleasant but disappointing reading. Of business tending to advance the interests of the photographic profession, or even of individual members thereof, the Association appears to have done none at all. It is, without doubt, a thing laudable enough in itself to bring together

once or twice a year a number of professional men for purposes of social intercourse, but, unless a distinct community of interest also prevails, experience shows that mere festivity and enjoyment are powerless to prolong the existence of peripatetic organizations such as the N.A.P.P. May we, as sincere and well-wishing friends of the photographic profession, express the hope that an early opportunity will arise for proving to the world that the National Association of Professional Photographers is not doomed to succumb to inanition?

* * *

An old friend and correspondent of the Journal, Mr. H. H. Cunningham, J.P., sends us this week a letter from Georgetown, British Guiana, in which the disadvantages that wait on photography in a hot, humid climate are realistically described. What does the stay-at-home photographer think of the phenomenon of plates being attacked by bacterial growths in a fortnight, or of the difficulties that also necessarily beset printing? The production of photographs under such conditions is a task that would delight a Tapley. Mr. Perkins's paper on *Photography in British Guiana*, which, by the kindness of the author and Mr. Cunningham, we also print, is a record of photographic work achieved in disadvantageous circumstances that forms instructive reading. We wish our friends of the British Guiana Graphic Club success in their pursuit of photography.

* * *

The following interesting announcement appears in a Newquay publication:—"After seven years of patient investigation, our townsman, Mr. Wallace Bennetto, Photographer of Newquay, has attained what at one time appeared to be an unrealisable dream, viz., photography in colours of nature, by *purely* photographic means. The results by this process are, beyond imagination, beautiful, being, in fact, what a true photograph should be, an exact representation of the subject. When the surroundings of Newquay are considered, it will readily be believed that photographs of the cliffs against the electric blue of the sea, varied by sea pinks in full bloom, are something quite in contrast to anything that has hitherto been accomplished.

* * *

"Several leading scientists and distinguished persons have seen the results, and have declared them marvellous. Those we have seen have left us with the same feeling, and we are glad now to publicly, as we have long ago privately, congratulate Mr. Bennetto on having discovered the long-sought-for Philosopher's Stone of photography. Mr. Bennetto intends to give an Exhibition at Newquay before the season is over. Already pictures of Newquay beaches and cliffs, sea and sky studies, sunrises and sunsets, flower pictures, and figures have been taken, and will appear with others in the Exhibition. The Exhibition will really be one of the greatest events in photography since its discovery, and this development by Mr. Bennetto will be regarded by the future scientific historian as of the greatest importance. We hope to be in a position to give further information soon; meanwhile we congratulate our town and ourselves on the discoverer being a Newquayite."

* * *

We endorse the aspirations contained in the concluding sentences of the above extract, but are surprised to learn, from a correspondent, that Mr. Bennetto declines to show the results to a photographer. We should have thought he would have sought the earliest opportunity to have had his discovery professionally verified.

PLATINOTYPE AND PLATINOTYPE PRINTING.

The gradual spread of platinotype work is made evident by the increasing number of queries on the subject we receive, as shown by our Answers to Correspondents. Experts in the process, and it is a simple one, can scarcely understand what there is to inquire about, but the query of a professional printer, as seen in our issue for last week, is a fair sample of the difficulties some beginners experience. Again, we were quite recently shown a letter received by a well-known contributor to these pages from a photographer with a large studio and good business, asking if he would object to do some platinotype prints, the writer having an order for some and not being able to get good results. Taking all these facts into consideration, it is evident a few practical remarks on the subject will be useful to many of our readers.

There is, however, at the outset, one piece of advice to give, which we offer in the confident assurance that, if attended to, it will solve the difficulties of nearly every worker. It is brief and to the point: "Carefully read the manufacturer's paper of instructions, and attend to them." It is quite easy to do this; yet how few there are who have adopted the advice!

The most important consideration in connexion with this class of prints is their permanency or otherwise. As to the prints being permanent, in the true sense of the word, there can be no possible doubt; but there is one little difficulty that arises. We have been told many such pictures have been known to fade. This we have always denied, the fact being that no fading can take place; but, at the same time, a large number of the platinotype prints sent out by workers of the highest skill do turn yellow or various shades of light brown in the whites. Nothing fades, but the whites discolour. Can this be prevented? Save by a complete sealing from the air, we have grave doubts. Most of the platinotypes we have seen after the lapse of a few years undoubtedly "go" in the whites; but, if there is no absolute prevention, it is true that, by carefully attending to instructions, this discolouration will be reduced to a minimum. Never less than three (and four would be still better) acid baths must be used, and, further, the prints must be continually separated while in the baths, or a larger proportion of iron will be left behind. It is the greatest mistake in the world to hurry this part of the process. We have before us as we write an exceedingly good portrait in platinotype, done by a well-known lady photographer, whose prices do not suggest any need to cheapen the cost of production, yet, though only a comparatively recent picture, it has gone a sickly, dirty yellow all over, showing this, of course, only in the whites and lighter tones. We therefore again say, Do not economise in the use of acid baths, and, above all, do not try to do cheaper work by using commercial hydrochloric acid, the yellow colour of which is mainly attributable to iron; that is the very body which we desire to keep out, or to eliminate when present; for it has been conclusively demonstrated that it is to the presence of iron imprisoned within the fibres of the paper that the degradation of the whites is attributable.

The next point that troubles so many is the want of crispness and brilliancy in the prints. But, in the first place, it must be remembered that a print, however brilliant, done on a dead surface, cannot compete for richness and range of tones with one done on a glossy surface. Leaving that point aside, however, it is certain that some workers only get the poorest, greyest, flattest of effects, whatever negative they print from and whatever the brand of paper they employ. But the main cause of this is simply the want of attention to instructions.

Those unaccustomed to chemical experiments cannot understand the readiness with which anhydrous substances can attract water from the atmosphere, but we wish to say in the most emphatic manner that a piece of unprinted platinotype paper left lying about for a few minutes is rendered worthless for producing perfect prints. Anything which leads to the possibility of moisture being absorbed leads at the same time to flat prints. Even when the paper is removed from the frame the same care must be taken. It is absolutely necessary to keep them in a box suitably prepared for retaining a dry atmosphere. If the prints are merely put in a drawer, or placed in any ordinary receptacle, poor prints will result. They must be placed in a box supplied with a desiccating material. Asbestos, impregnated with chloride of calcium, is usually employed. Yet, again, it must be remembered this drying agent does not last for ever; it soon gets wet, and is then useless till it has been strongly heated to drive off the moisture it has absorbed. For the same reason care must be taken not to leave the lid off either the store tin or the tin in which prints are kept. Every time the lid is removed, damp air enters, and has to be desiccated by the action of the absorbent. We are convinced that the bulk of the complaints arise from this source of evil alone. Paper will keep good for months if the original package be not opened.

Another point that has been objected to is that the tone cannot be varied to the subject, like albumenised paper; but surely this is no disadvantage if the defect exists; no one complains of the want of variety in the colour of engravings. But, as a matter of fact, there is considerable variety of tone possible. First, there is the sepia modification; and, next, a great variety of shades of black to brown by varying the temperature of the solution and the length of time of keeping the unused paper.

Others, again, have it that it it necessary to use a special class of negative to get good results; but the paper is so much improved nowadays that it must be a very poor, thin negative from which a good print cannot be got. Further, almost every degree of hardness or softness may be obtained by using new or old paper.

A rusty colour in the shadows is often complained of. Here, too, it must be remembered that bronziness in the shadows of an albumenised paper print cannot always be avoided, and in platinotype this rustiness is comparable to bronzed shadows. It can, however, often be avoided by using weaker developing solution. It is possible that occasionally the makers send out papers defective in this respect, but none but experienced workers are competent to say that this rustiness comes from over-strong developer, and that rustiness comes from defective paper.

We have briefly touched upon the points most likely to arise in the practice of beginners, and, in conclusion, will repeat our advice, that most troubles will disappear if the makers' instructions are learnt and followed.

PRINTING DIFFICULTIES IN HOT WEATHER.

That we are now passing through one of the most trying periods of the year scarcely any of our readers will require reminding; but, though the difficulties surrounding the use of our plates of to-day during hot weather are far less than they were ten years ago, the same cannot be said of our printing papers. Now is the season when the alum bath becomes an absolute necessity with gelatine papers, and even with collodio-chloride it is a great aid to success. With the former, although the prints, with care, may pass safely through the ordeal of washing without damage, it is practically impossible to mount them. We have heard many complaints lately in this direction, and only a few weeks ago we experienced the difficulty ourselves with some gelatino-chloride prints that had been dried after washing, but without using the alum bath. They were rewetted previous to mounting, but the gelatine surface proved more adhesive than the mountant, and, on rubbing down, they became firmly attached to the paper used, and, after ineffectually trying to save the first two or three, we were compelled to alum the rest.

During the hot and "thundery" period of last year, about this time, we heard a good deal about the effect of heat and thunder on gelatine films, but the most remarkable instance we have yet heard of the narrowness of the line that divides us from the borderland of danger with gelatine papers has just reached us from an amateur correspondent. It appears he had just finished toning and fixing a number of gelatine prints, and, though the weather was by no means sultry, it was close and "thundery," a storm actually occurring a few hours later. The prints had appeared more than usually tender, and had required careful handling, but had shown no signs of actual softening. The dish containing them had been left for a few minutes on the kitchen sink, when, on going to change the water, the colouring matter was seen to be oozing out from between the prints and the dish in precisely the same manner our correspondent describes it—as from a piece of carbon tissue before stripping for development. On attempting to lift the prints, those in contact with the bottom of the dish were found to have melted and become attached firmly to it, while the upper layers were perfectly intact. A subsequent inquiry showed that, during his absence, the domestic had emptied a saucepan of hot water into the sink, and this, flowing round the porcelain dish, had warmed it sufficiently to upset the "tottering state of equilibrium" of the gelatine and produce the result stated.

Many workers with gelatine papers object to the use of alum, on account of the difficulty of ensuring its complete removal after it has done its duty. Alum, we know, has been recommended as an eliminator of hypo, and in that capacity we know many have used it to their cost, and have come to regard it with no friendly feelings. The opinion so frequently expressed in these columns on the subject of hypo eliminators is well known, and we are inclined to agree with a statement we heard made a few days ago, that, of the two, alum is a more dangerous enemy to our prints than hypo. If carelessly used or imperfectly removed, it is undoubtedly so, and we can safely say, from our own experience, that we have had more cases of unstable prints from amongst those that have been alumed after fixing than from those not alumed. Very probably, if the alum were applied before fixing, it would not prove so dangerous, because, knowing the necessity for its removal before passing the prints into the hypo, greater care would be taken in washing.

We are inclined to believe that a far safer application will be found in chrome alum, especially if it be first purified by Professor W. K. Burton's method of washing the powdered crystals with spirit. We have used it in place of ordinary alum, in solution of about four or five grains to the ounce, and, judging by the comparative effect produced by prolonged immersion, we should say it is far safer than that salt. If a print be cut into three portions and immersed in solutions of ordinary potash alum, chrome alum, and hypo, the first will be bleached out or turned yellow in two or three hours at the

outside, that in the hypo undergoes a very gradual reduction in depth, but no serious discolouration, for perhaps twenty-four hours, while the chrome alum seems to make very little difference.

It has been recently recommended to alum collodio-chloride prints, in order to harden the gelatine under surface, and some operators perform this function before toning; but it cannot be too strongly borne in mind that, unless very completely removed before toning, the alum will cause great trouble. This has been pointed out in connexion with gelatine prints, with which it has been recommended in order to counteract the softening effect of sulphocyanide. With collodion, owing to the nature of the film, it is not supposed to require so much washing to remove it. This is perhaps true so far as the collodion itself is concerned, but there is the gelatine film underneath to be considered also, for which reason we advise that at least as perfect washing be given, or else the alum left until after toning at least.

Shortening the Exposure in Röntgen Work.—In reference to the suggestion of Mr. Porter recently described by us, Mr. Alexander Thurburn writes to *Nature*, giving details of a very easy method of applying it. He says: "Many tubes for Röntgen-ray researches have the edge of the cathode mirror opposite the short neck, and in such cases the expedient, described by Mr. Porter in your issue of the 18th ult., can be very easily carried out by fitting an indiarubber ring on this neck, winding two coils of copper wire round it, and leaving two or three inches free at one end, which is then bent so as to bring the point sufficiently near to the cathode loop." This seems a very easily arranged application, which any of our readers would have no difficulty in bringing to a practical test.

The Balloon Polar Expedition.—The steam ship *Lofoten*, which left Spitzbergen on the 18th inst., reports that Herr Andrée would commence filling the balloon on that day, and, if the meteorologic conditions were favourable, would make the ascent on Monday last, the 27th. This venture has been much commented upon ever since it was first proposed, and the safety of the intrepid explorer and what he will accomplish engages the minds of many at the present time. It requires a considerable degree of pluck for an arctic expedition, even with the most complete equipment, but with such a frail bark, and one of such an uncertain destination as a balloon, much more. Every one wishes Herr Andrée all the success his daring enterprise deserves, and a safe return.

Photographic Evidence.—On several occasions we have alluded to the fact that the ends of justice might frequently be furthered if photography were used more in evidence than it usually is. For example, in the case of railway accidents, photographs, if taken immediately after the occurrence, and before anything is disturbed, would sometimes help materially to elucidate the cause. So in the case of murders, where there is often a great discrepancy in the evidence of witnesses as to the state and position in which the victim was when first discovered, owing to the natural state of excitement at the time, photographs, if forthcoming, would often be more decisive. We notice in a report of the inquest on the body of the unfortunate girl who was recently murdered at Hemel Hempstead that the doctor who was called in his evidence said that, before allowing the body to be disturbed, he took five photographs of it. Those photographs, whether they help in furthering the ends of justice or not, are better evidence as to the position and surroundings than will be any verbal testimony that may be brought forward.

The X Rays in Divorce.—By the New Photography is generally understood by the lay public, and even photographers, photographs produced by the Röntgen rays. In connexion with this subject, a correspondent sends us a cutting from a daily paper—an advertisement of one of those inquiry agencies that engage to find out where private people go, what they do in their late hours, what company they keep, &c. We give the cutting as it appears *verbatim*, omitting, of course, the name and address, as we shall not give this, to us, latest expert in the New Photography a free advertisement: "The New Photography.—Owing to the success ——— has personally achieved with the New Photography, he is prepared to introduce same in divorce matters free of charge." To us it would be exceedingly interesting to learn how Röntgen's discovery is, or can be, utilised in divorce matters, even if a substantial charge were made, instead of its being free. At present, we must confess it is "beyond our ken," and probably is beyond that of Professor Röntgen himself. This is the only reply we can give to our correspondent.

Röntgen Rays.—A few weeks back we mentioned that a Berlin physician had found that the intestines could be photographed by the X rays provided they contained solutions of metallic salts. Now, according to the Berlin correspondent of the *Standard*, a German army doctor has found that chlorine, bromine, and iodine in a pure state are not easily penetrated by the Röntgen rays, but that this fact is not a consequence of the grouping of the atoms in the molecule, but depends upon the atoms of the haloids. From that he concludes that all chemical combinations of the halogens are impenetrable by the X rays in proportion to their halogenic percentage. This doctor—Dr. Scharwald—has also found that the shadows of the soft parts of the body are partly produced by the iron contained in hæmoglobin and in the alkaline metals, and especially by the chlorine the soft parts contain, and that muriatic acid, chloroform, liquid chloride of carbon, and especially liquid bromoform, all free from water, are almost impenetrable to the Röntgen rays, and they therefore act as a filter for them. The four most important elements—carbon, hydrogen, oxygen, and nitrogen—it is also said are almost absolutely penetrable by the rays. If this be the case, there seems to be a further important use for Röntgen's discovery.

A Cause of Unsteadiness in the Use of Delicate Recording Instruments.—Every one familiar with microscopic work, visual or photographic, is aware of the almost complete improbability of avoiding tremors at all times under the usual conditions. Professor H. Turner at Oxford has been making a series of experiments which have a practical bearing upon the point, working upon old data which suggested the possibility of the weight of a shower of rain actually causing a distortion of the earth's surface, as he could not call down with success a shower of rain whenever he wanted to test the matter, he utilised the services of a body of sixty-seven men, whom he marched and countermarched in compact or in loose order, and found that no effect was produced until the walls of the observatory were reached. Hence he concluded that, with regard to displacement from the vertical of any apparatus, there was practically nothing to be apprehended from such an event as a heavy fall of rain. It was yet evident that external agencies are quite capable of effecting the indications of delicate instruments. For example, "small local earthquakes" were supposed to be acting causes in such cases.

Departure of the Eclipse Expedition.—This expedition is now on its way, and is timed to reach Vadso on Monday next, so as to allow sufficient time to make the necessary preparations for the work to be done. This expedition is unique, inasmuch as it is a scientific one and a pleasure trip combined. It has been arranged and carried out by the Messrs. Gaze, who have chartered the *Norse King* for the purpose—a large vessel, formerly one of the P. and O. liners. It has about a couple of hundred berths, lighted throughout by electric light, and magnificently fitted; indeed, it may be considered a first-class floating hotel. Large as is this vessel, it was found necessary to supplement it by another, to accommodate some sixty more passengers, for whom there was not room aboard the *Norse King*. Few scientific expeditions have been made under such

uxurious conditions as this. Often they have been made under just the reverse state of things, and the members of them have had to put up with many discomforts, not to say "rough it." Amongst the company are many ladies, doctors, professors, colonels, a bishop, &c. It is to be hoped that this array of talent and learning, under such auspicious conditions, both as regards time of day and season of the year, will materially add to our knowledge. The duration of the eclipse is about a minute and three-quarters at Vadso.

A Cheap Grating for Astro-photographic Special Work.—The very great expense attendant upon the use of a diffraction grating is a bar to its employment by many; but a recent invention of Messrs. Hall & Wadsworth, described in the June number of the *Astro-physical Journal*, will enable the desired work to be done at an immense reduction in cost of apparatus. Some idea of the saving possible will be obtained when it is stated that the new grating, if applied to the Lick telescope, for example, would only cost the one two-hundredth part of what would be required for the ordinary kind. The experiments were made with a twelve-inch lens working at an aperture of *f*·18. Two screws twenty-seven cm. long, and with sixty-three threads to the centimetre, were cut in two along their axes, and the half screws mounted parallel to each other on opposite sides of a rectangular frame. Copper wire was thrown across the successive threads of the half-screws, and soldered to them so as to form a grating. When applied to the telescope, photographic spectra of both the first and the second order could be obtained, and cases are quoted showing the agreement of the adduced wave-length with Rowland's values. The exposure to wind was found disadvantageous, but it is proposed to avoid this by soldering light rods across the wires parallel to the half-screws.

Stability of Aluminium.—The uses to which this metal is being put are so numerous, and in photography it is so very useful, that many investigations have been made as to its power to withstand not only atmospheric influence, but also the corrosive action of many substances with which it is likely to be brought into contact. The cause of the dull grey tarnish so familiar upon unlacquered aluminium has been attributed to the presence of small quantities of sodium taken up in its manufacture, and means have been devised for preventing its presence. The *Journal of the Franklin Institute* contains a paper on this subject by Mr. J. W. Richards, who has been investigating the action of corrosive liquids upon the metal when alloyed with various other metals. The bearing of his experiments is to the effect that pure aluminium is more resistant to alkalies than any alloy, as it is also to nitric acid and common table salt solutions. If, however, free hydrochloric acid is contained in a liquid for which aluminium vessels are employed, Mr. Richards finds that an alloy containing two per cent. of titanium is of advantage.

It is worthy of note in this connexion that mercurial salts, so often found in the photographic laboratory, are, according to Mr. Percy A. E. Richards, F.I.C., writing in the *Chemical News*, decidedly injurious. He finds that nearly all mercurial salts have an action of a continuing character. "It seems to me," he writes, "that this result is brought about by the mercury first forming an amalgam with the aluminium, and this, reacting at once on the moisture present in the air or on the surface of the metal, forms alumina, at the same time liberating the mercury, which once more forms amalgam. . . . In short, these results show that the greatest care should be taken to prevent any apparatus, &c., of aluminium being brought into contact with mercury in any shape or form."

FOREIGN NEWS AND NOTES.

Development of Chloride Prints.—Ed. Liesegang, in the *Photographisches Archiv*, expresses the opinion that the development of printing-out papers will be more generally adopted, and may supplant other processes. Such prints are also superior to those produced on the usual papers for development only. The developer should not be alkaline, or at most only slightly so, otherwise fog ensues. Wilson's method he rejects as being difficult to work. Ferrous oxalate and amidol also are quite unsuitable, as they produce a general blackening of the image. Hydroquinone and gallic acid are practically the only two useful developers. Others, like pyrogallol, brenzcatechin, and para-amido-phenol, produce unpleasant tones. Hydroquinone, with acetate of soda and citric acid, yields prints that, after fixing, have the appearance of ordinary prints, viz., a warm reddish-yellow. Gallic acid, with addition of acetate of soda, also produces warm tones if printing is somewhat full and development stopped at an early stage; but the tones are not as pure as with hydroquinone. With short exposures the tone assumes a greenish colour. The methods of development may be divided into two classes: the first, in which a colour is given to the picture that does not require modification by toning with gold. This can be done with gallic acid, and red-brown, olive, or greenish-black prints may be obtained. The second method requires after-toning in a combined bath. A little reflection will show that hydroquinone is the most suitable for this, because the toning depends upon the presence of a red silver deposit, which is modified by the blueness of the gold. The photographic tone is due to the red of the silver showing through the thin blue deposit of gold. Black bromide prints will receive a deposit of gold, but are not toned because the colour cannot be modified by the gold deposited. Some time ago the writer recommended tannin as a developer. It yields a red tone, but is valueless in practice. The colour is not as pure as with hydroquinone; the back of the print is liable to discolouration, and it spoils the combined bath.

Copying Frame for Photographs on Wood.—In *Die Photographie* we read that a new frame has been patented by K. Schlatter, of Stuttgart. It has the appearance of an ordinary pressure frame, but without the back and springs. The negative is held in position by means of thin, broad steel plates, fitted with screws for adjustment to any of the usual (Continental) sizes, and the plate cannot be shifted. The block of wood is brought into position by means of fine-threaded screws, of which there are two on each side of the frame. The pressure is secured by means of small screws, which are more suitable than wedges, on account of greater uniformity. The block can be examined as often as necessary without fear of displacement.

Warnerke's Sensitometer.—A source of error in the use of this instrument, that has hitherto been unnoticed, forms the subject of a short article from the pen of Dr. G. Eberhard, in the *Photographische Correspondenz*. The sensitometer is constructed with a shutter between the scale and the phosphorescent tablet. The latter is hinged, and is turned over, like a door, on to the scale for exposure. Thinking the shutter might be an unsafe protector of the plate, whilst burning magnesium in front of the phosphorescent tablet, a trial was made by inserting a plate in the frame and burning three centimetres of magnesium ribbon at five centimetres' distance from the closed shutter. To the writer's astonishment, about eight numbers of the sensitometer could be easily read on the plate. As a distance of five centimetres is usual in burning magnesium ribbon in front of the tablet, the writer recommends the substitution of a metal shutter for that of wood supplied with the instrument.

Toning Lantern Slides.—In the same periodical, Th. J. Placzek, of Vinna, writes in reference to the toning of collodion transparencies. If pyrogallic acid be used, instead of iron, for development, a pleasing blue-black deposit results, that can be easily toned with neutral chloride of gold, chloride of palladium, &c.; but the large addition of glacial acetic acid to the developer makes double the exposure necessary as compared with iron development. In consequence of this, attempts have been made to tone the greyish-black image of iron-developed positives, and the following bath has been found very useful:—

Solution of potassium chloro-platinite (1:50)	4 c.c.
Nitric acid	12 drops.
Solution of chloride of gold (1:50)	3 c.c.
Distilled water	550 to 600 „

The plates, after fixation with hyposulphite of soda, or preferably cyanide of potassium, are well washed, and, whilst still wet, placed in the toning bath for one to two minutes. They acquire a blue-violet tone, which is found very suitable for lantern slides or stereoscopic transparencies. Dry-collodion plates may also be toned in this bath, but the process is much slower, owing to the horny character of the collodion film, which resists the penetration of the solution. A bath of potassium chloro-platinite (1 : 1400), slightly acidified with hydrochloric acid, gives a blacker toue. A solution of—

Water	500 parts,
Sulphocyanide of ammonium	20 „
Hyposulphite of soda	½ part,

added in equal quantity to the following:—

Water	500 parts,
Chloride of gold solution (1 : 50)	30 to 40 „

gives grey-blue tones. Platinum and gold toning is very successful with these baths.

Phosphorescence in Development.—A. Helheim draws attention to this subject in the *Photographisches Archiv*. After reciting the experiments of Dr. Neuhauss in 1892, Dr. Precht in 1895, and those of Lenard and Wolff in 1888, he writes that he has had similar experience in studying the action of formaldehyde as a constituent of the developer. He made up a developer of—

Water	30 grammes.
Pyrogallic acid	1 gramme.
Carbonate of soda	1½ grammes.
Formaldehyde (40 per cent.)	2 „

The negative was over-exposed and fogged. After laying aside a few minutes, the plate was seen to glimmer, first at the edges and then towards the centre. The light was bluish-white, and observable even in presence of the dark-room lamp. The phosphorescence appeared as soon as all moisture was absorbed from the surface, and lasted several minutes. Thinking the absorption an important factor, as the phosphorescence was imperceptible whilst the plate was in the dish, the writer tried the effect of another absorber of water, and added 30 c. c. of alcohol to the developer. A very intense phosphorescence was at once visible. As it passed away, it could be revived by shaking the bottle. The addition of alcohol, of course, precipitated the carbonate of soda, and produced similar conditions to those in the experiments of Lenard and Wolff, who poured pyrogallic acid developer into an equal quantity of saturated solution of alum.

The Roller-blind Shutter.—Dr. R. Krügener, in the *Photographische Mittheilungen*, compares this shutter, used immediately in front of the plate, with one he has constructed of similar pattern for use in front of the lens. He maintains that a slit passing in front of the lens can be quite as effective for exposure as a slit passing immediately in front of the plate. Light, passing through a slit in a shutter on the front of the lens, will fall upon the plate in band form. Take a blind 40 mm. long with a slit 3 mm. wide. This gives an aperture of 1·2 sq. c. The lens, a collinioscope, with aperture of 35 mm. and largest effective stop of 30 mm., covers the plate 13 × 18 c. sharp to the edges. The slit exposes on the plate a band 30 mm. wide, or about ⅛ of the length. But, as the blind aperture is 1·2 sq. c. and the aperture of the stop is about 7 sq. c., the illumination is only about ⅛, as compared without the shutter. But, as the light passing through the slit covers only ⅛ of the plate, it is six times more intense, for with full aperture the light is distributed over the entire plate. It therefore follows that, in using the slit in front of the plate, even with full aperture, no more light passes the blind than if the shutter is placed in front of the lens. We have now only to deal with the breadth of the band of light. With the same speed for both shutters the band of light, 30 mm. wide, with shutter in front of lens, must travel 4½ times quicker across the plate, than with the blind next the plate. The first must traverse 40 mm., and the second 180 mm. Theoretically, a slit of the breadth, $\frac{30}{4·5} = 6·6$ should suffice, if next the plate, and in practice, as shown by comparative experiments, the writer finds such a slit gives the same results as a slit of 3 mm. in front of the lens. A shutter fitted to the front of the lens may be turned to any angle, according to the subject, and its smaller size is a great advantage.

A German Photographic Convention.—The *Deutsche Photographen Zeitung* announces the twenty-fifth Convention of German Photographers at Trèves on August 25 to August 29. This is a professional gathering, and promises to be very successful. There will be an exhibition of photographs, apparatus, and objects of historical interest. Excursions and papers on photographic subjects also form part of the programme. The German Photographers' Association have organized this gathering, and their balance-sheet for the year ending December 31 last shows an income of about 530*l*. There is a balance in favour of the Association of about 170*l*., subject to some outstanding liabilities. We wish our German friends every success, and we hope their Convention will be a most enjoyable one.

CELLULOSE AND ITS DERIVATIVES.

[Royal Photographic Society.]

WHAT has cellulose to do with photography? is a question which may have occurred to many of our present audience, and may express a certain curiosity which accounts for their presence. We, on our part, do not expect to gratify any anticipations which proceed from the "Athenian" desire to hear some new thing. In the first place, cellulose is an extremely common substance, and while it is, so to speak, the theatre of many of the most striking dramas of the molecular world, it would be itself popularly described as an extremely uninteresting substance. It is true it discharges a number of important functions in the natural world, and then employs a stupendous amount of capital and labour in fitting it for further uses in the human sphere. But the same might be said, for instance, of water; and it is not to be expected that a substance, colourless, inert, and devoid of positive characteristics, and, above all, of the commonest, should be able, *per se*, to excite the imagination. In the domain of science, on the other hand, nothing is "common;" and, if a substance plays a large part in the natural order, it is entitled to the more consideration. In endeavouring to treat scientific subjects from the point of view of general interest, these aspects always conflict, and the present is not likely to prove an exception. If, therefore, we venture on an all-round treatment of the subject matter "in the hope that by any means we might save some" who, as yet, are in darkest ignorance of the position and function of this remarkable substance, cellulose, we are sure to offend fellow-specialists who are well acquainted with the essential outlines of the subject, but who may expect disclosures of new matter containing suggestions of theoretical or technical progress. *Que faire?*

Perhaps, if we address ourselves to the consideration of the uses of cellulose, actual and possible, in photography, we may succeed in getting somewhere near that highest level to which the lecturer can aspire, that is, to offend the least number.

Photographic processes depend essentially upon the two factors, the photo-sensitive substance and the medium through which it is distributed. This holds for photographic action in its widest sense, which is, indeed, of the widest, for it includes the whole arena of light actions.

What radiant energy accomplishes in the plant world we know as an aggregate: but the mechanism of its actione is as yet largely unknown. But here also, as in the photographic plate, we have the same essential factors, the photo-sensitive substance and the medium through which it is distributed.

In photo-sensitive substances we have the common property of absorbing light energy. The energy appears to undergo that kind of "appreciation" by which it becomes chemical or atomic. We are accustomed to changes of terms, or transformations in radiant energy. A familiar example is afforded by the "incandescent" gas burner: the hood or mantle of the special oxides of which it consists has the effect of changing the character of certain constituents of the total radiation of the flame, raising or lowering them to the condition associated with maximum luminosity. Another example, but of a different order, is afforded by the phenomena of electrolysis. The electric current is passed between two conductors through a fused metallic salt or its aqueous solution. The two constituents of the salt, metal and acid, are separated and appear each at its respective pole or conductor. This may be regarded in general terms as a com-

munication of energy to a compound body, and the appreciation of the energy lands the constituents of the compound into the emancipated condition of elementary or dissociated molecules.

So much briefly and superficially concerning the main function of the photo-sensitive substance.

And what of the medium? The media actually used in practical photography are not many. They have one feature in common, they belong to the group of colloids. The term applies to a diversified group of compounds containing representatives of all the more prominent chemical types: bases, acids, salts, alcohols, ethers, &c.

It distinguishes a common property of such compounds in solution, viz., that of forming, when dissolved, gelatinous or viscous liquids, as opposed to the limpid or mobile solutions of the compounds known as crystalloids. The group of phenomena summed up in these two antithetical terms were exhaustively investigated in certain directions by Graham, many years ago. But in recent years they have been more profoundly studied, and have in fact become one of the most prominent arenas of pioneer work in molecular physics. It is, of course, in the order of things that the problems of physical science should become more and more refined. The chemistry of a generation ago revelled in discoveries which were striking enough to excite the crudest intellects. Thus the enrichment of the world by the introduction of the coal-tar colours and the colossal industry which has been built up on this foundation, offers broader features of interest, which excite wonder and interest from whichever point of view regarded. We doubt whether the current and future developments of chemical science will prove attractive in the same sense.

Of the problems of more general import now engaging the active work of investigators, we may cite the following as having a direct connexion with our subject: *the theory of solution*, the mechanism of the process, and the actual molecular condition of substances in solution; more broadly, the actual configuration of molecules in the various states of aggregation of matter, and the connexion of physical properties with the order of configuration.

The *theory of assimilation* in the plant world. How radiant energy is brought in the plant cell to act upon such unpromising materials as carbonic acid and water and mould them into starch, cellulose, &c. The *theory of photographic action* in the narrower sense: what is the actual meaning of the "invisible image" produced by the impact of light on the prepared plate?

The connexion of these groups of phenomena with one another may not be obvious, and it would take us too far afield to demonstrate their intimate relationships to those who have not as yet given any thought to the subject. It is sufficient for our present purposes to remind photographers that they are moving in very good company as regards the science of their art. We may go further in stating that the science of photography is intimately bound up with coming developments of the greatest moment.

It is important therefore that its working basis should be broadened as much as possible, and to include all substances or materials calculated to contribute. We cannot help thinking that cellulose is destined to play a more important part than heretofore, if not in the art, at least in its scientific developments.

This is our preliminary answer in general terms to the question, "What has cellulose to do with photography?" We shall now demonstrate the more important properties of the substance in the hope of suggesting a few subjects of investigation and practical inquiry, which in the hands of experts should lead to results.

The external or mechanical properties of cellulose are remarkable, and there can be no better demonstration of the wide range of variations of aggregation and structure which are conditioned by these properties than an exhibition of specimens of cellulose in its most characteristic forms, natural and artificial.

Here we have, of the former group, the fibres—cotton, rhea, calotropis; side by side we will place the new artificial silk or "lustra-cellulose," which has recently been the subject of much writing, *ad captandum populum*, in the daily press. Far be it from us to endeavour to invade the "precious" incredulity with which many will meet the statement that this "silk" is identically the same in substance as cotton. As a matter perhaps of unpleasant duty, we have to point out that its brilliant lustre is due merely to the fact that it is a solid cylinder of smooth and regular outline, whereas the cotton fibre is a flattened tube with membranous walls. The form of the "silk" favours regular and maximum reflection of light, that of the cotton favours the scattering and breaking up of the incident light.

Here we have a coarser thread, also prepared in continuous length by squirting a viscous solution of cellulose into a liquid which precipitates or solidifies it. This thread is carbonised for making the filaments of the electric incandescent light, the resulting carbon having great compactness or density. Here, again, we have the cellulose in the form of artificially prepared films, which are transparent and of great tensile strength. Again we have the cellulose in masses of a firm resistant jelly, a form in which it separates, combined with water, from certain aqueous solutions to be afterwards described. In this form it has considerable elasticity, approximating in the mass to that of indiarubber, though without the exceptional texture of the hydrocarbon. This hydrate parts with its water with extreme slowness, and the cellulose molecules in aggregating together constitute a solid of extraordinary hardness and taking an extremely high polish.

These solids are so dense in texture that they are hardly amenable to wood-turning machinery, and the usual comment which is passed on a casual inspection is that they must have been submitted to an enormous pressure. As we have seen, on the other hand, the only factor involved is the extraordinary cohesion of the cellulose molecules or particles. Of course, in the natural world, cellulose and cellulose compounds, which constitute the entire framework of the vegetable world, present themselves in an imposing array of structural forms, from the tenderest silky mycelium of a fungus to the densest of woods, such as lignum vitæ. But in these natural forms there are considerable variations of chemical composition which somewhat invalidate comparisons. We have therefore chosen the various forms of the pure substance, natural and artificial, as an object-lesson of the great diversity of structural form which one and the same substance may assume. But we have now to deal with the more interesting question of the chemistry of this substance. So far we have remained in the region of sense impressions; the province of the chemist is in the sub-sensible region, which can only be entered through the channels of the imagination. At the same time the results of the chemist can be very well appreciated apart from a close study of their theoretical basis, and we must endeavour to give a brief chemical history of cellulose from this more limited practical point of view.

Cellulose is, for a compound of carbon, hydrogen, and oxygen, a body of remarkable inertness. It entirely resists a number of very severe treatments, more especially is able to withstand the action of alkalies at high temperatures. It is difficult of attack by oxidising agents. The industrial value of cellulose and its unique position and functions in the vegetable world are largely due to these negative characteristics. If we compare cellulose with the well-known substance starch, to which it is in many respects nearly related, we find that both are aggregates of sugar or glucose groups.

Starch, on the one hand, is soluble in water, and easily broken down in solution by certain ferments to the simple sugars of which it may be regarded as compounded. Cellulose is insoluble in water, and can only be resolved into sugars by the action of powerful reagents, such as sulphuric acid.

In its original fibrous and insoluble form, cellulose is therefore a very unattractive substance. It is useful to the photographer in the various forms of paper which are employed in the art; but in these uses the negative characteristics of the substance are to the fore, and we shall therefore pass them by.

Special interest, however, attaches to cellulose when it is obtained in solution. There are three groups of treatments for obtaining such solutions.

(1) There are certain compounds of the metals which in aqueous solution dissolve cellulose directly:—

(*a*) Zinc chloride. When warmed with a forty per cent. solution of this salt, cellulose swells up to a gelatinous mass, and finally dissolves to a homogeneous viscous solution. The cellulose is reprecipitated in flocculent masses on dilution with water, the precipitate retaining a large proportion of zinc oxide approximately in the proportion $2C_6H_{10}O_5.ZnO$.

By alcohol the compound is precipitated in a tenacious homogeneous form—*i.e.*, in films or threads, according to the method of bringing the liquids together.

We have often wondered why photographers have made no use of this solution. It certainly lends itself to the manipulations with which the craft is familiar, and appears to offer a method of preparing a suitable medium for carrying the photo-sensitive substance, whether on glass or paper. Certainly it should be found useful in investigations, and we commend the preparation to notice as affording a plastic modification of cellulose—one, moreover, which is easily obtained.

(*b*) Zinc chloride dissolved in hydrochloric acid.

A solution of the salt in twice its weight of the aqueous acid acts instantaneously on cellulose in the cold, and for many uses in research work has therefore important advantages over the preceding solvents.

Photographers may make some interesting demonstrations with this solution. If a platinum print be laid face downwards upon a resistant surface—*e.g.*, glass, porcelain, or asbestos—and the reagent poured upon the paper, the solution of the paper is accompanied by the appearance of the photograph in full detail. The effects are interesting, and, as every chemical effect finds a practical application somewhere or other, we quite expect to see this solvent taken advantage of.

We have now described two solvents of cellulose—one a normal salt, a compound of a metallic oxide and an acid in equivalent proportions; and one an acid solution of this salt. We have now to describe an alkaline solvent, a compound of a metallic oxide which may be regarded as having acid properties, with the alkali ammonia.

(*c*) Solutions of cuprammonium are prepared by adding precipitated copper oxide to strong aqueous ammonia. Crystallised copper sulphate is dissolved in water, and to the cold solution caustic soda (solution) is added. The blue gelatinous precipitate of copper oxide (hydrated) is well washed on a cloth filter, squeezed and pressed, and stirred into strong aqueous ammonia.*

The solution should contain the reagent in the proportion NH_3, 10 to 16 per cent., C_4O. 25 to 30 per cent.

The solution may be also prepared by placing scrap copper in contact with very strong ammonia and in presence of air. The metal is oxidised by the oxygen of the air, and the oxide dissolved by the ammonia.

This solution rapidly attacks cellulose in the cold, and forms usually gelatinous or ropy liquids. The reaction has been largely used in the arts for treating cloth and paper; the treatment with the solvent, followed by evaporation of the solvent on the fabric, leaves the surface in a condition impervious to moisture. As far as we know, there have been no applications of this solution or the reaction in photography. But we see certain possibilities of results, and we have therefore included it in our list of cellulose products.

These three solvents constitute a group; their action depends upon reactions of a not very definite order, speaking chemically. They may be broadly described as an interaction of acid and basic groups of the cellulose itself, reciprocally with basic and acid groups of the respective solvents; there results therefore in each case a species of soluble double salt.

We cannot here discuss the theoretical bearing of the reactions, and we must refer those who wish to follow them up to the special literature of the subject.

We now pass to methods of dissolving cellulose which depend upon well-defined reactions, in which the cellulose is converted into derivatives or compounds belonging to well-known groups. These reactions are reactions of synthesis, and take place with those groups of the cellulose molecule the presence of which make it an alcohol. The reactions of cellulose are, in fact, exclusively those which belong to the group of alcohols. Thus, if we write ordinary alcohol, the arch-fiend of the "blue-ribbon" philosophers, as $C_2H_5.OH$, we may write cellulose, for the purpose of this discussion, as $C_6H_9O.(OH)_4$. It is the OH groups which are alcoholic.

We shall now describe one of the most characteristic of such compounds of cellulose, which occupies an intermediate position between the ill-defined compounds above described and a group to be subsequently dealt with in conclusion. It is a compound soluble in water in all proportions, whereas in the latter group, that of the acid ethers of cellulose, the relationship to water becomes negative: they are eminently water-resisting compounds. In respect of this property, therefore, the transition is maintained. Cellulose is attacked by solution of the caustic alkalies at a certain degree of concentration, *e.g.*, at and above a strength represented by twelve per cent., Na_2O on the solution. The effect on the fibrous celluloses is remarkable. They swell up, shrinking considerably in length, and become translucent or transparent. The effects are due to the definite combination of the cellulose and alkali in the proportion $C_6H_{10}O_5 : Na_2O$. We may express the compound "alkali cellulose" in the abbreviated form, $X\begin{matrix}ONa\\ONa\end{matrix}$. This compound in the presence of water reacts with carbon bisulphide in the cold. The molecules unite thus, $X\begin{matrix}ONa\\ONa\end{matrix} + CS_2$. The resulting sulpho-carbonate of cellulose may be written as $CS\begin{matrix}OX.ONA.\\SNa.\end{matrix}$ The compound is perfectly soluble in water, and the solution is now employed on the large scale in several industries, being known as "viscose." Its most important property is that of decomposing spontaneously on keeping, the cellulose being regenerated in compact coherent masses. The decomposition is more rapid at high temperatures.

* See also *Ber. Deutsch. Chem. Ges.*, 13, 1822.

Obtained as described, the solution has a yellow colour, due to by-products of the reaction. The pure compound is obtained by treating the crude solution with a saturated solution of common salt or with alcohol. Both reagents precipitate the pure cellulose sulpho-carbonate. If the liquids are poured into the viscose, the compound is precipitated in flocculent masses; but, if the viscose be spread upon a glass plate and the whole submerged beneath the precipitating solution, the compound is obtained as a coherent film of a greenish colour.

CROSS, BEVAN AND BEADLE.

(*To be continued.*)

PHOTOGRAPHY IN THE INTERIOR OF BRITISH GUIANA.

[British Guiana Graphic Club.]

My first experience of photography in the bush was in 1884–5, when I accompanied Mr. E. Im-Thurn to Roraima. At this time there were, I think, but few amateur photographers in the colony, as I remember I found it particularly difficult to get any dry plates for my camera, which was a quarter-plate by Lancaster, kindly lent to me by the late Mr. Glaisher, Curator of the Museum.

I went to one or two of the professional photographers, but they said they were unable to let me have any plates, as their own supplies were small, and they might at any time run short. At the eleventh hour, I may say, Mr. Gilzean, who was then at Anna Regina, kindly lent me, through Mr. Im-Thurn, some three dozen plates, and with these I tried my best to secure good pictures of Roraima and the adjacent country.

I had decided to take a camera with me only a few days before we left Bartica, and I had not had any lessons or practice at all in photography, and therefore made up my mind to just expose the plates and repack them for development in Georgetown on our return.

There was only one double back to my camera, so my chances of taking many pictures at a time were very limited. To remedy this, however, I obtained from Mr. Norton, who was then established in Georgetown, a small collapsible changing box, made of cloth, covered with pasteboard, and provided with a red-fabric light side, and a pair of observing glasses through which the work of plate-changing could be easily seen and carried out, the hands being introduced into the box by two sleeves fitted with elastic, which tightened over the arms. After taking pictures on the two plates in the double back I had to use my changing box for refilling, and at the same time repacked the two plates that had been used.

In this way I managed to expose all the plates, but, of course, had no idea of the value of my results, which, I regret to say, were far from satisfactory. One of my minor difficulties was the instability of the camera which had a nervous, irresponsible way of supporting itself, and in the occasional strong gusts of wind which prevail at certain seasons on the mountain, and especially about 5300 feet up, the camera and all blew bodily over. I got over this trouble, after one or two falls of my instrument, by suspending a heavy stone from the centre of the wooden platform under the bellows body of the camera, but it always took a considerable time to prepare for action before a stone suitable for the purpose could be found and tied up in position.

When I got back to Georgetown the plates were submitted to Norton for development, and were all pronounced by him to be suffering from red fog; some of them were over-exposed and yet others under-exposed. I show here some prints taken from the best of the negatives.

I found the plates travelled fairly well, they were carried in their own packages wrapped up in brown paper, and placed inside tin boxes, and were, at times, exposed to very considerable heat, both when taken to and from Roraima, over the open savannah country, where the sun beat down fiercely all day long on the backs of the Indian porters who carried our luggage day by day from one camp to another.

I think the chief reason why the plates did not turn out well was my entire ignorance of photography at the time, but I also fancy that my changing box may not have been quite light-tight. I intended to have brought it down to town for Norton to test it, but it had to be left behind at the mission in the Potaro River, along with some other things, as we had very little room for the boats in which we came to Bartica from the mission, and I never saw my belongings again.

Thus ended my first endeavours in photography, and I did not take it up hotly again till 1887, when I purchased the half-plate camera I always use now; and, after some instructions from Norton, I provided myself with six dozen of Rouch's plates, and in September, 1887, left Georgetown for the Puruni River, where I remained seven months, and where I had a regular camp, but no dark room for developing plates or other photographic work.

On the way from Bartica I took a few pictures, intending to work them up when I reached my destination, as I had no opportunities to do so whilst on the journey. The plates I changed at night by a red lamp, and repacked the exposed ones in their original packages. When I got to my chief camp on the Puruni, I found a small house already built, and which had been occupied by the surveyor, who had been there before me. The sides were roughly wattled and let in the daylight freely, so all my developing work had to be done at night.

I fixed up a couple of shelves, one to hold my developing dishes and lamp, and, above this, another, on which I placed a bucket filled with water, which I used by means of a flexible indiarubber tube employed as a syphon, the water being shut off when not required by a spring paper-clip.

The bush water, I found, did not injure the plates or stain them in any way, though it was not quite colourless, being of a light brown; and I used to find that, if the alum dish was allowed to stand till morning, there was always a slight brown scum at the bottom, whilst the rest of the solution was clear. One of my chief troubles in developing was the lightning, which on certain nights compelled me to give up work altogether, and which fogged several of my plates when a sudden flash illuminated the whole house and the surrounding bush. On what I called regular lightning nights I did not attempt to work, but, as I have just said, I lost a few plates by lightning when I commenced work on what appeared to be a favourable night, in which, however, there were unexpected lightning flashes.

Another trouble was the presence of fireflies and the fire beetles, which were occasionally quite numerous, and seemed to have a partiality for a dull red light such as my lamp emitted. I don't know what is the actinic force of a firefly's or fire beetle's light, but I ascribed the fogging of some of my plates to their being exposed to this light; and I am afraid the force of my language exceeded that of the insects' light.

For the final washing of my plates, I used to subject them, after a copious washing with the water through the indiarubber tube, to a soaking of a couple of hours in a bucket of water. I found this imperative, as I could not store enough water before night fell for all the work I wished to do, and I always refrained from getting more from the river at night, as the bank was high and precipitous, and on the only occasion on which I tried to get water at night I nearly fell into the river.

My present practice, when photographing in the bush, is to leave development till I return to town, unless a favourable opportunity offers of using a dark room, or unless I can get some house where I am likely to stay for a day or two, and where the plates, after thorough washing, can have time to dry. This I don't look upon as a satisfactory plan, owing to the fact that the picture of an effective view of some spot visited on a journey may turn out very badly, and the place may not be revisited, or, if revisited, the attendant circumstances of time, weather, and light, may not be at all favourable for a successful picture.

On the few occasions on which I have developed whilst actually travelling, I have found that, owing to the great dampness of the air, my plates did not dry by next morning at half-past six, by which time everybody was ready to start on the next stage of the journey, and the plates had to be put into light-tight tin boxes, grooved inside to hold plates. Once I found some large ants had taken a fancy to the films in the night, and had eaten off most of the pictures, again a vigorous boviander kicked a mass of sand over the negatives, and another time I found a dog belonging to the boat captain industriously licking the negatives, with strips of gelatine hanging on to each side of his mouth. As one's position is constantly changing during a bush journey, it often happens that the same route is followed when returning to Georgetown, chances occur of taking pictures of places which have been already photographed, but which have not turned out well, and I hope to be able, in future, to allow myself sufficient time always to develop all my plates when I have got to the end of my journey from town, so that I may repair any deficiencies on my return to town if necessary.

Concentrated developers and vulcanite dishes reduce the bulk of the load when travelling, and should be adopted. The plates themselves, if the journey be a long one, and the stay from town extend over some months, should be specially packed, and particularly so if it be intended to leave development till the return to town, as I found during my stay in the Puruni, although I had each dozen of plates packed in soldered tin cases before I left town, and did not open the last two dozen till about three weeks before I returned to Georgetown, that some active deteriorating effect, the cause of which I am ignorant, had set in, and I was unable to get a single good result from the last plates.

I submit for your inspection one of these, and would like to hear your views on it. I had many others, which I regret to say I have been unable to find, and may have possibly destroyed them.

H. I. Perkins, F.R.G.S., *Acting Commissioner of Mines, British Guiana.*

STEINHEIL'S IMPROVEMENTS IN LENSES.

Herr R. Steinheil, the patentee, says: "The discovery of new sorts of glass has rendered it possible to produce two kinds of lenses which consist of two positive, equal or similar parts, each of which is in itself chromatically, spherically, and astigmatically corrected, consequently the finished lens contains these three corrections, whereas formerly lenses of two positive, equal or similar parts, could only be corrected chromatically and spherically, as, in attempting to effect the astigmatic correction, an unsymmetrical construction resulted. Astigmatic corrections can only be made on a divisional surface of two mediums which presents the concave side to the greater refractive medium, whilst the spherical correction can only be made on a divisional surface which presents the concave side to the lesser refractive medium.

"With this principle as a basis, lenses can be constructed out of symmetrical or similar halves, which on the first divisional surface of the separate halves are corrected astigmatically, and on the second surface are corrected spherically. Lenses so constructed have this characteristic, that a positive lens is enclosed by a double convex one, and by a double concave one, both of which have a higher refractive power than the enclosed positive lens.

"The lens shown on the accompanying drawings consists of symmetrical or similar halves, differing only in proportion, each of which is composed of three cemented lenses. The middle lens is a positive one, and is enclosed by a double convex lens and by a double concave lens,

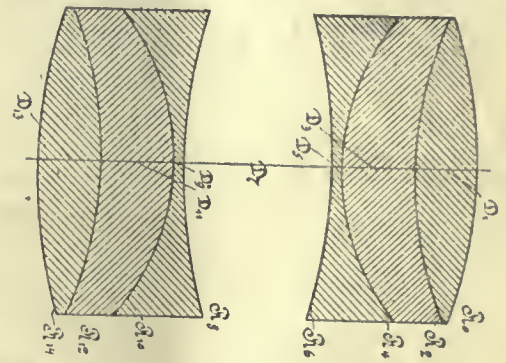


Fig. 1.

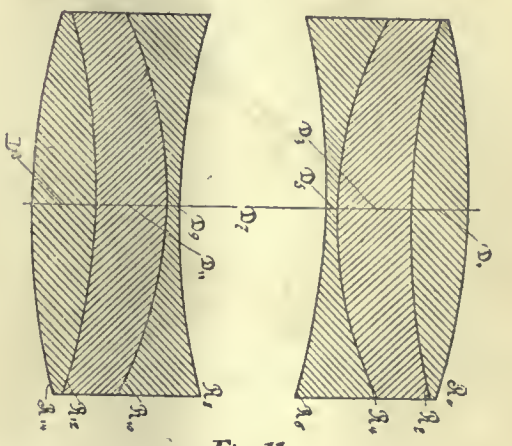


Fig. II.

each of the two latter possessing stronger refractive power than the enclosed positive lens.

"Fig. 1.—Taking a focal distance of 492 mm., a lens constructed on the principle of this invention, with a degree of exposure of 1 : 6, would have the following elements:—

$x\,0 = 41.$

R 0 = R 14 = + 173,00 mm. R 2 = R 12 = ± 139,66 ,,	D 1 = D 13 = 20 mm.	nD = 1,61003 nF = 1,61759
R 4 = R 10 = + 77,805 ,,	D 3 = D 11 = 25 mm.	nD = 1,51874 nF = 1,52561
R 6 = R 8 = - 202,47 ,,	D 5 = D 9 = 4 mm.	nD = 1,56370 nF = 1,57160

Difference D 7 = 50

nD and nF = the indices of refraction for the Fraunhofer lines D F.
R = Radii. D = Thickness.
$x\,0$ = Radius of lens aperture.

"Fig. 2.—With a focal distance of 476 mm., with an exposure proportion of 1 : 4, the elements of a lens constructed from the foregoing point of view are the following:—

$x\,0 = 59{,}5$

R 0 = R 14 = + 229 R 2 = R 12 = ± 562,95	nD = 1,62356 nF = 1,63498
R 4 = R 10 = ± 142,03	nD = 1,50786 nF = 1,51351
R 6 = R 8 = - 490,196	nD = 1,60304 nF = 1,61128

D 1 = D 13 = 20; D 3 = D 11 = 25; D 5 = D 9 = 4; Difference, D 7 = 50

The claim is:—A lens consisting of symmetrical, or similar halves, differing only in proportion, each of which is composed of three

cemented lenses, namely, a positive lens, a double convex lens and a double concave lens, the two latter enclosing the former, and both of said double convex and double concave lenses possessing stronger refractive powers than the enclosed positive lens.

WHAT IS IT?

[London and Provincial Photographic Association.]

I NEED not apologise for bringing this subject before you to-night, but, from numerous failures and peculiarities observed in plates by experimentalists, it warrants a close investigation. A few weeks ago Mr. Hodd exhibited here several negatives somewhat strangely marked. These marks, although not new to us, are very puzzling. In them I at once recognised an old enemy, and recalled to my mind the fact that I had several examples by me of a more marked character, taken about eight years since. I exhibited them at the time, and, although some of our members ventured theories, yet I was not satisfied, still living in hopes that the mystery would be solved some day. When an effect is produced from more than one cause, the difficulties of investigation are very great.

Here is a plate that has been placed, film side, in contact with a piece of glass, in order to prevent any chemical action; the two plates were wrapped up in brown paper, and a small hole torn through the wrapper. Several thicknesses of white cigarette papers were placed over the hole, then the parcel was further covered with more brown paper; this packet was carefully put away for about three months; then, an energetic developer applied, a dark mark came up corresponding with the hole in the inner paper. I don't for one moment think that the X rays have anything to do with the phenomena; it is evidently a phosphorescent action emanating from the cigarette papers.

Who amongst us has not been a sufferer from markings on the negatives, caused by the separating cards? Believing that it was a chemical action, I had some cards dried and thoroughly saturated with paraffin wax. I used them as separators. The cure was worse than the disease; the markings gradually spread almost into the middle of the plate. This must be phosphorescence in the cardboard. I have lately examined some plates, made about ten years, that were separated with tinfoil. They developed clean and clear to the edges, thereby showing the valve of tinfoil as a separator. The expense might be less than cardboard. Three pieces, three-quarters by half an inch, are sufficient for twelve quarter-plates. See, here are several negatives that represent an accelerated and restrained action. They are drop-shutter exposures, and taken on board a P. and O. steamer off Colombo. You will notice that, in one, half of the plate is comparatively insensitive—that is a restrained effect; in another you will perceive an accelerated effect; another where the image has almost disappeared; and another where the reversed action has commenced. How can we account for this? In one we have an exudation from the dark slide, which attacks the film (a sort of waterproofing), thereby preventing the equal reduction. I have carefully tested this by subjecting a plate, or part of a plate, to the vapour of turpentine. If I take a plate and put it in a dark slide, and keep it close to a small, wet pad, say of chamois leather, leave it there for a quarter of an hour in the dark room, then I quickly examine the plate by reflected light, I notice that the plate is glossy, *i.e.*, the part that was near the damp pad. This moisture acts as a restrainer, and, if a very energetic developer be applied, the film will slightly fog, leaving the moist part clearer. This is easily explained—moisture is the delinquent.

I have discovered that moisture under varied circumstances will give different effects. Here is a plate that has been cut in half; one half has been exposed in a dark slide for about twenty minutes in sunlight, the other half exposed the same length of time, the only difference being that a stencil plate, cut out of leather, has been glued to the shutter, a brass escutcheon being fixed, and the leather plate moistened with water. Both halves of the plate were placed in a strong developer, with the result that a strong impression of the escutcheon plate and leather is visible. Examined carefully, you will see that the part of the brass plate nearest the plate is less sharp. This I cannot understand. If a moist piece of leather is put at one end of a dark slide, and the sun allowed to play on the dark slide through the leather for about twenty minutes, on development you may have a light action more apparent at the moist end, or you may have a restraining effect, as aforesaid.

As far as the sunlight experiments are considered, I think the X rays are to be credited; but, at the same time, credit may be given where it is not due. The plate-makers have a legitimate excuse when plates give out or deteriorate. Many dealers keep their stock of plates on shelves, exposed to strong light, and, if a small amount of moisture is present, it is only a matter of time before the plates go bad.

I might argue that, as the X rays do not readily pass through glass, that might account for markings round the negative. I may mention that the plates I experimented with with the tin foil were kept in the dark. I am continning experiments, but I cannot hope to exhaust them. suffice it to say, I have some celluloid receivers made, by which I intend to pass the light through various substances. Some years ago Professor Gladstone showed some interesting experiments at one of the British Association meetings showing the absorbent of light property of disulphate of quinine. I repeated the experiments successfully. He demonstrated that, when a wine glass half full of ink and another half full of a colourless solution of quinine were photographed together, it was impossible to distinguish one from another. It has also been stated that light passed through a cell of quinine, that it rendered the light safe for wet-plate photography. This I did not find correct, yet I have made an experiment which tends to show that quinine does exercise some influence on the invisible rays passing through dark slides.

I think the information suggested by these experiments valuable to plate-makers; in the mean time, I would suggest separating by tinfoil, keeping the plates in metal boxes and in the dark.

In conclusion, I will ask an oft-repeated question (which is usually answered by asking another), Why is a gelatine plate more opaque when wet than dry? Usual answer, What good will it do you if you knew?

But I want to know. A. L. HENDERSON.

ANIMATED PHOTOGRAPHS AT MARLBOROUGH HOUSE.

ON Tuesday evening, the 21st inst., Mr. Birt Acres had the honour of showing some of his animated photographs at Marlborough House, by command of H.R.H. the Prince of Wales (through General Sir Dighton Probyn), before the distinguished company invited by the Prince and Princess of Wales to the dinner in honour of the marriage of H.R.H. the Princess Maud of Wales to H.R.H. Prince Charles of Denmark. The demonstration was given in a specially arranged marquee in the grounds of Marlborough House. The company, which numbered about seventy-five, included the following: H.R.H. the Prince of Wales, H.R.H. the Princess of Wales, T.R.H. the Crown Prince and Crown Princess of Denmark, T.R.H. the Crown Prince and Princess of Sparta, H.R.H. Prince Nicholas of Greece, T.R.H. the Duke and Duchess of Connaught, T.R.H. Prince and Princess Christian of Schleswig-Holstein and her Highness Princess Victoria of Schleswig-Holstein, H.R.H. Princess Louise (Marchioness of Lorne) and the Marquis of Lorne, H.R.H. the Duchess of Albany and her Serene Highness the Princess Elizabeth of Waldeck-Pyrmont, H.R.H. Prince Christian of Denmark, H.R.H. Prince Charles of Denmark, H.R.H. Prince Harold of Denmark, H.R.H. Princess Ingeborg of Denmark, H.R.H. Princess Thyra of Denmark, T.R.H. the Duke and Duchess of York, H.R.H. Princess Louise (Duchess of Fife) and the Duke of Fife, H.R.H. Princess Victoria of Wales, H.R.H. Princess Maud of Wales, T.R.H. Prince and Princess Philip of Saxe-Coburg, H.R.H. Princess Frederick of Schaumberg-Lippe and his Highness Prince Frederick of Schaumberg-Lippe, H.R.H. the Duke of Cambridge, his Highness Prince Christian Victor of Schleswig-Holstein, their Highnesses Prince and Princess Edward of Saxe-Weimar, his Highness the Duke of Teck, H.S.H. Princess Victoria of Hohenlohe-Langenburg and Countess Feodora and Helena Gleichen, T.S.H. the Prince and Princess Adolphus of Teck, Count Gleichen, Count and Countess Siegfried Clary and Countess I. Kinsky, the Danish Minister and Madame de Bille, the Swedish Minister and Countess C. Lewenhaupt, the Greek Chargé d'Affaires and Madame Metaxa and Count and Countess Ahlefeldt Laurvig, Mdlle. de Wimpffen, Count Moltke, Captain Bull, Lieut. Lewald and Col. the Hon. Hy. Byng, Mdlle. Condostavalo and Col. Sapountzakis, Lady Mary Lygon, the Hon. Derek Keppell and Sir Charles Cust and Comtesse Sermade, Baron Gablenz and Captain W. Campbell. Lord and Lady Colville of Culross, Lord and Lady Suffield, General Sir Dighton and Lady Probyn, Sir Francis and the Hon. Lady Knollys, Major-General and the Hon. Mrs. A. Ellis, Major-General and Mrs. S. Clarke, Miss Knollys, Commander the Hon. S. Fortescue, the Hon. Stonor, and Mr. Holzmann, &c.

The programme consisted of twenty-one scenes as follows:—

1, *Capstone Parade, Ilfracombe.* 2, *Children Playing.* 3, *Great Northern Railway—Departure of an East Coast Express.* 4, *The Derby*, 1895. 5, *Niagara Falls* (in three tableaux): No. 1, The Upper River just above the Falls; 2, The Falls in Winter; 3, The Whirlpool Rapids. 6, *The German Emperor Reviewing his Guard previous to the opening of the Kiel Canal, June*, 1895. 7, Carpenter's Shop Scene, *Refreshments.* 8, *The Boxing Kangaroo.* 9, *The arrest of a Pickpacket.* 10, *A Visit to the Zoo.* 11, *Yarmouth Fishing Boats Leaving Harbour.* 12, *Golf Extraordinary.* 13, *Tom Merry* (lightning artist) *drawing Mr. Gladstone.* 14, *Tom Merry* (lightning artist) *drawing Lord Salisbury* 15, *Boxing Match in two rounds by Sergeant Instructor F. Barrett and Sergeant Pope.* 16, *Highgate Tunnel.* 17, *Henley Regatta.* 18, *The Derby*, 1896. Clearing the Course; the Preliminary Parade; the Race: "Persimmon" wins; the rush, intense enthusiasm, waving of hats, &c. 19, *Broadway, New York.* 20, *A "South Wester."* 21, *H.R.H. The Prince of Wales accompanied by T.R.H. The Prince of Wales, Princess Victoria, and Princess Maud, arriving at the Cardiff Exhibition, June* 27, 1896.

All the pictures were well received, but in the last picture Royalty recognised themselves as they had never been portrayed before; and, as the figures were thrown life size on the screen and the portraits were clear and distinct and readily recognisable, this picture met with the most enthusiastic reception, and, in spite of the fact that the programme was an exceptionally long one, this last picture had to be repeated.

At the conclusion, H.R.H. the Prince of Wales personally thanked Mr. Birt Acres.

The disc thrown on the screen was perhaps the largest that has been attempted in this class of work, measuring as it did about eleven feet by

eight feet six inches, and the light throughout was excellent, largely due to the facts that transparent films were used.

H.R.H. the Prince of Wales gave Mr. Acres permission to take kinetic photographs on the following day at the wedding, and we understand that Mr. Acres secured excellent negatives each 80 feet long and consisting of about 1500 separate photographs of the departure of the royal party from Marlborough House and also of the return to Marlborough House after the ceremony at Buckingham Palace. Later on, Mr. Acres secured an excellent negative on the Lawn of Marlborough House of the departure of the royal couple for Sandringham.

Mr. Acres was greatly impressed with the kindness and consideration of their Royal Highnesses, as every facility was granted to him to ensure satisfactory results both at the demonstration on Tuesday evening and also while the photographs were being taken on the wedding day.

THE W. H. HARRISON FUND APPEAL.

Acknowledged last week	102	3	0
Albert Clout, Esq.	1	1	0
Mrs. Louisa Lowe	2	0	0
	£105	4	0

Further donations will be thankfully acknowledged by

FREDERICK H. VARLEY, 82, *Newington Green-road, London, N*

The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

MAGNESIUM LIGHT.—J. H. asks for a comparison between sun light and magnesium. As I use magnesium in preparing the standard tint for my actinometer, and made careful trials for the purpose, I can give him some information. I found that two grains of magnesium ribbon, burned in a coil at a distance of four and three-quarter inches from the object, had the same actinic power as two seconds' exposure to mid-day June sunlight and skylight.—ALFRED WATKINS.

LENS QUERY.—NON-MATHEMATICAL READER writes: "Distance of object and focus of lens being known, to find size of image also, size of object and focus being known, to find distance at which an image of a certain size can be obtained. Can you give me formulæ for working out these calculations?"—We cannot go into the matter here, but, if our correspondent will bring a little thought and common sense to bear on the table of conjugate foci in the ALMANAC, he will not have much difficulty in arriving at a solution of both questions.

CHROMATE OF SILVER IN EMULSION (To "Billericay").—It seems to me that there must have been free nitrate of silver present as well as carbonate in the film referred to by your correspondent, in which case a somewhat complicated reaction would result. In the first place acid chromate of silver would be formed by the mutual decomposition of the silver nitrate and the bichromate, and this is soluble in water, while any neutral chromate formed at the expense of the silver carbonate would probably be partially or wholly decomposed and rendered soluble by the nitrate of potash formed in the first reaction. In order to secure a film of insoluble or neutral chromate of silver, there should be nothing present but carbonate of silver."—SYNTAX.

UNMOUNTING GELATINE PRINTS.—ALBUMEN writes: "Will any one kindly recommend a reliable method of unmounting gelatino-chloride prints that have apparently been put on the cards with a gelatine mountant? I have a number of such prints to take off the cards and transfer to an album or scrap-book, and, as they are of some value to the owner, I dare not risk spoiling them. I have soaked them in cold, and even in slightly, warm water, but cannot get the slightest sign of detachment. With albumen prints it would be an easy matter to use hot water, but this is out of the question with gelatine, and to render the gelatine print insoluble would also result in a like action upon the mountant. Is there any method of removing them?"

PHOTOGRAPHING THE MOON.—ASTRO asks: "Is it possible to take instantaneous photographs of the moon sufficiently sharp to bear subsequent enlargement? I have a four-foot focus (about) achromatic lens, which, I am told, is a telescope lens; if I mount this in a long tube, can I take photographs of the moon and stars without any driving apparatus and with a moderate-sized atop? Will the pictures be sufficiently sharp for, say, lantern slides? Or would the lens work with full aperture?—it is four inches in diameter, and therefore equal to about *f*-48. Can you give me any idea of the exposure necessary with quick commercial plates, and whether it is worth my while to attempt astronomical photography under these conditions?"—Perhaps some of our readers who are familiar with this class of work will supply the information.

ALKALINE INTENSIFICATION OF WET PLATES.—Without doubt, "Wet Plate" (page 444) is correct in what he says with regard to the retarding influence of the layer of silver deposited by the first developer, but this may, especially in the case of under-exposure, be an argument in favour of the alkaline method of intensification. With a properly prepared bath film, there is very little difference in the sensitiveness whether iron or alkaline pyro be used; but with a collodion emulsion film, or when pyro and silver is employed as the developer, the alkaline method is much the quicker. Now, in case of under-exposure, whatever may be the first developer employed, obviously there still remains the small proportion of haloid that has been acted on by light, and which, being practically uncovered by any silver deposit, or a very slight one, is fully exposed to the reducing action of the alkaline intensifier, while the better-exposed portions, covered with a thicker coating of reduced metal, are more thoroughly protected, and do not undergo proportionate reduction. Thus, this style of intensification would seem calculated—as it actually does—by its selective action to favour the production of detail and softness, and this is very markedly the case when acid pyro is the first developer used.—SYNTAX.

SULPHOCYANIDE TONING.—TWO YEARS AN AMATEUR says: "I have hitherto met with very fair success in printing, using —— and —— paper, with both of which the sulphocyanide bath gives me as good results as I could desire; but, recently, my dealer, being out of both those brands, sent me —— instead. Now, although the instructions give the sulphocyanide amongst other formulæ, I cannot, with this paper, work it at all. If the toning bath be new and of full strength, the first few prints pass through it fairly well; but, after less than one-fourth of the proper number have been toned, it becomes very slow in action, and eventually refuses to tone at all. Adding more gold 'wakens it up' a little; but, although the image may tone, the high lights and half gradations take a variety of tints—pink, yellow, and even green—and, after fixing, the things are simply horrible. I cannot get the paper changed, as the dealer implies that it is my fault, not that of the paper. Have you, or any of your readers, had similar experience with this special brand of paper?"—It is against our rules to discuss the relative working merits of commercial preparations, but we may say that, with other toning formulæ, we have used this brand of paper with satisfaction. Why not try acetate or phosphate, both of which work well?

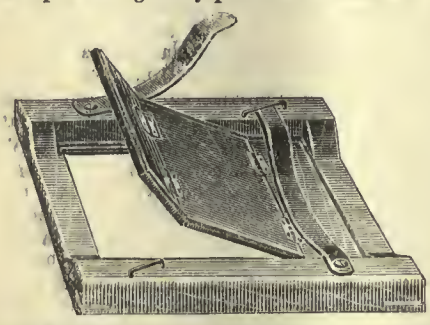
CHROMATE OF SILVER (To "Billericay").—J. P. writes: "Having made the statement to which this correspondent alludes, namely, that an insoluble chromate of silver is formed by the action of bichromate of potash on carbonate of silver, I suppose I must, as I am prepared to, justify it. If 'Billericay' will heat an emulsion, or an emulsion film, containing nothing but pure carbonate of silver with bichromate of potash, he will find the fact as I have stated; the chromate of silver will remain, and will withstand any amount of washing. If, however, there be any soluble nitrate present, either in the form of decomposition products or of free silver nitrate, then, no doubt, the chromate formed will be more or less soluble, as he states, being in the first case acted upon by the nitrate of potash, soda, or ammonia, as the case may be; on the other, by the nitric acid set free by the reaction of the silver nitrate with the bichromate. I imagine that 'Billericay' has operated upon an emulsion made by double decomposition of the salts in the gelatine, but this is not the best way of making a carbonate emulsion. If the carbonate of silver be precipitated from aqueous solutions of the salts and washed, it will readily emulsify in warm gelatine, and bichromate may be added to it without fear of loss, or the film of gelatino-carbonate may be dried and sensitised with bichromate in the same manner as carbon tissue."

Our Editorial Table.

The "Mosely" View and a Half-Printing Frame.

G. Houghton & Son, 89, High Holborn, W.C.

This frame is novel in construction. It has a double-jointed back, which allows of a three-quarter view of the print being obtained at either end, thus permitting every part to be examined. The print is



held firmly, so that it cannot possibly move during examination. The advantage of being able to view the whole of the print without incurring the risk of displacing it should render the "Mosely" frame very popular. It is cheap and well made.

Marion's Large Bamboo Double Mirror.

Marion & Co., Soho-square, W.

The useful accessory here illustrated will, doubtless, be found of great service in the professional studio. The mirrors are five feet



From a photo by W. & D. Downey, Ebury-street.

long and two feet broad, and are of plate. Full-length reflections are to be obtained, and it can easily be seen that many novel poses will suggest themselves to the photographer. The whole is of solid bamboo on casters.

White Enamel Bromide Paper.

Morgan & Kidd, Richmond, S.W.

The white enamel bromide paper of Messrs. Morgan & Kidd, of which they have sent us specimen prints, together with sample for trial, has a very great degree of gloss, thus imparting to the finished picture the appearance of a highly glazed collotype. This surface conduces to the obtaining of the utmost detail. In use, the manipulation of the paper does not differ from that of ordinary bromide paper. The white enamel bromide paper will doubtless be appreciated for a variety of special purposes, as the results it yields are in every respect excellent.

A Retouching Powder.

Norman Vine, 5, Elthorne-avenue, Hanwell.

This is an extremely fine impalpable powder, for imparting to unvarnished negatives a smooth matt bite for taking pencil work. It is applied by means of a fine linen rag, and can afterwards be varnished. As a substitute for matt varnish on the glass side of the negative it is also recommended. The powder appears to answer its purposes very well.

Catalogues Received.

McGhie & Co., 75, St. Vincent-street, Glasgow.

The supplemental catalogue of Messrs. McGhie is devoted to the latest introductions in lenses; finders; cameras, hand and stand; studio stands; shutters; apparatus generally; mounts; backgrounds, &c. The catalogue should be useful alike to professional and amateur, for, in the familiar phrase, it is well up to date.

David H. Hogg, 662, Craig-street, Montreal.

If we may judge by the handsome catalogue before us, Mr. Hogg holds a very prominent place amongst Canadian photographic dealers. It is a well-executed compilation, the choicest photographic goods of England and the United States being described and illustrated in its pages.

News and Notes.

Messrs. F. S. Thorn & Co., of 169, Camberwell New-road, inform us that in future their firm will be known as Thorn & Hoddle.

The Convention Group.—No. 58 is Mr. J. Houghton, of Leeds; No. 71, Mr. A. Nicholson, Leeds; No. 51, Mr. William Booth, Manchester; No. 101, Mr. Walter Booth.

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock, on Wednesday evening, August 5. Subject for discussion, *The Use of Small Cameras and the Making of Enlarged Negatives.*

Leicester and Leicestershire Photographic Society.—An Exhibition of photographic pictures will be held in the Co-operative Hall, High-street, on Tuesday, Wednesday, and Thursday, November 24–26. There will be one open competition, viz., for landscape or seascape, with or without figures, and a silver or bronze medal will be given for the best and second best single pictures. Full particulars may be obtained from the Secretary, T. Brown, 68, Church-gate, Leicester.

Mr. Jackson, of King's College, has been lately examining with the spectroscope the light emitted from different fluorescent screens under the influence of the X rays. According to last week's *Electrician*, he finds that the barium platino-cyanide and the potassium platino-cyanide give respectively the light of barium and of potassium, which is an important point, seeming to show that we are not dealing with vibrations of the molecules, but rather with some of the constituent atoms. This confirms Professor Silvanus Thompson's remark made during an address recently delivered at Oxford, that "X rays apparently can touch the atom within the molecule and set it into vibration."

A new material for filling paper has recently been introduced under the name of "nematolith." It is of a fibrous nature, and promises to prove of great utility as a filler. Chemically speaking, a member of the asbestos family, it has an advantage over the latter, owing to its freedom from the iron, lime, and sulphur compounds that are usually found in crude mineral asbestos, the raw material from which nematolith is prepared for paper-making purposes testing, on analysis, 96° of pure silicate of magnesia. It is very white, and, owing to its fibrous nature, it is readily retained by the pulp. It may be hoped that it will take the place in America of the very heavy filling of barytes there used.

An account is given in the *Physical Review*, by R. A. Millikan, of some careful tests of light emitted by glowing solids and liquids, with a view to discover the laws of its polarisation. This phenomenon is exhibited strongly by incandescent platinum, silver, gold, and by molten iron and bronze; a somewhat feebler polarisation is shown by copper, brass, lead, zinc, and solid iron. The most significant result named is that polarisation is minimum with rays emitted normally to the surface, and maximum at a grazing emission, thus indicating that the vibrations take place in a plane at right angles to the emitting surface. Glass and porcelain also emit polarised light, but to a lesser amount; fluorescent bodies do the same, so that evidently a high temperature is not necessary; and in the case of uranium glass it is said to be the green reflected light which is polarised, and not the blue incident light diffused from the surface.

THE SANDELL EXHIBITION, 1897.—This Exhibition of the work of the Managing Director of the Sandell Works Company on the Sandell plates will be opened on April 1, 1897, and continue open until May 31, at the Works. It will consist of upwards of four hundred pictures, principally 15 × 12, comprising Continental Views, the Halls of the City Guilds, the Guildhall and Mansion House, Gray's Inn, Lincoln's Inn, Lambeth Palace, Westminster Abbey, Windsor Castle, Pharmaceutical Society's Establishment, 1896 Convention Views. Many users of the plates have promised contributions, and the support of all interested in furthering the advance of photography is invited. The Company are prepared to pay the carriage to and fro of all exhibits.

IT is well known that the bones are relatively opaque to the X rays, and that this opacity is due to the chemical composition of the fundamental bony tissues, which are made up of calcium salts (phosphates, carbonates, and fluorides). The question would then be a natural one, whether, by introducing a salt of lime into the veins, they could be made to leave a shadow on the photographic plate. The Physical Institute at Rome has performed this experiment. Into the brachial artery of a dead body was injected a paste of sulphate of lime, sufficiently liquid to penetrate all the blood vessels, and then, after it had hardened, the hand was photographed, the Crookes' tube being held at a great distance, so that the shadows would be very sharp.—*Cosmos*, Paris.

RÖNTGEN X RAYS COMPETITION.—The council of Animals' Hospital and Institute, which it will be remembered was established in memory of Sir Henry Hawkins' famous dog, "Jack," primarily with the object of providing the poor with gratuitous treatment for their animals, propose holding a competition with the object of showing improvements in the Röntgen X rays, as applied to the diagnosis of lameness and disease in the human subject or the lower animals. Owing to the unfortunate illness of Professor Atkinson, the well-known bone-setter, who has charge of the Exhibition, it is perforce postponed, but probably, before long, what cannot fail to be an interesting collection will be shown at the institute in Kinnerton-street, where at present Professor Matthews, the medical superintendent, has a number of animal patients under treatment.

NOVAK and Sulc have examined nearly three hundred substances on the absorption of the Röntgen rays by chemical compounds. Their method of investigation consisted in attaching rings of glass to a sheet of paper, and placing uniform layers of the finely pulverised materials in the different rings, so that the thickness of the layer was 0·4 cm. in each case. The paper with the rings was then placed over a photographic plate, which was enveloped in black paper, and exposed to the Röntgen rays for a period of twenty to twenty-five minutes. By comparing the photographic effect of the rays where the substances were interposed, the relative absorptions were determined. The authors found, says the *American Journal of Science*, that a great number of organic compounds containing only carbon, hydrogen, oxygen, and nitrogen, are equably penetrable, and hence they conclude that the absorption has no relation to molecular weight or the arrangement of the atoms. Organic halogen derivatives were found to possess much greater absorption, which increased with the number of halogen atoms present. This effect increased with the atomic weights of the halogens, two atoms of bromine having a greater effect than six chlorine atoms, while iodine derivatives were entirely impenetrable under the conditions used in the experiments. This indication of the influence of elements of varying atomic weight led the authors to examine a series of elementary substances, all of rather low atomic weights.

ALUMINIUM GLASS.—M. Leon Appert, the distinguished glass expert, has contributed to the *Moniteur de la Céramique et de la Verrerie* an able article, in which he discusses the prominent part which, he thinks, alumina is destined to play in the manufacture of glass. "After having made numerous analytical tests of ancient window glass," says M. Appert, "I have arrived at the following conclusions, which appear to be of practical industrial value. The introduction of alumina into glass prevents, or at least retards, devitrification, which will occur always by the slow and repeated lowering of the temperature. The presence of alumina makes it possible that a part of the alkaline bases, soda or potash, may be replaced advantageously by an equal quantity of lime. Glass thus modified in its composition is more solid, less changeable, and more elastic. The alumina can be added to the silica without any inconvenience in a proportion not exceeding seven to eight per cent. The fusibility of glass is slightly increased thereby, while its ductility is not sensibly diminished. The only inconvenience that can arise from the use of aluminium is that it will colour the glass to some extent. This colouring does not result from the alumina itself, but from the action of the iron oxide, which is always found in it when in an impure condition. To sum up, the use of alumina, which permits its introduction only into bottle glass containing larger proportions of sand bases, should be extended equally to glass destined for other purposes, such as mirror glass, window glass, and especially drinking glasses. The quality of such glass would be greatly improved thereby. In the latter case the addition of alumina could best be accomplished if pure clay or, still better, if feldspar is used, which can be obtained at a low price. For the batch, the purest materials possible should be selected among those destined to furnish the silica, soda, and lime bases."

AT the annual general meeting of the Victoria Institute, Sir George G. Stokes gave an address on the Röntgen rays, and described at considerable length the work which led up to Röntgen's discovery. Referring to the fact noticed by Lenard, that the cathode rays could pass through aluminium, he said he did not think they did so in a manner analogous to the passage of light through glass. Supposing the cathode rays to be, strictly speaking, not rays, but streams of molecules, he suggested that an electrical action took place through the aluminium, resembling what electrolysis was on one theory supposed to be. The molecules, being highly charged with electricity, might set in motion, on the other side of the aluminium wall, other molecules similarly charged. Sir George Stokes then proceeded to discuss the nature of the Röntgen rays. They had their origin in the part of a Crookes' tube opposite the cathode; but they were not cathode rays. That they could pass through substances opaque to ordinary light did not prove they were not of the same nature as light. Light was regarded as consisting of transversal vibrations propagated in the luminiferous ether. Supposing X rays to consist of a process in the ether, were the vibrations giving rise to them transversal or longitudinal? They differed from ordinary light in several ways; but, if phenomena of polarisation could be obtained from them, that would prove them to consist of transversal vibrations. Many experiments had been made to get such phenomena, but most had failed. One or two investigators thought they had been successful. If that were so, we might affirm that the X rays were due to transversal vibrations of the luminiferous ether. The absence of diffraction and interference phenomena was explicable on the supposition that the vibrations were of an exceedingly high order of frequency. Lord Kelvin, in proposing a vote of thanks, said he had listened with satisfaction and comfort to Sir George Stokes, and his faith had been strengthened by what he had heard. Sir George declared for transversal vibrations, and he himself felt fortified in accepting that view. Not, however, that the fact was absolutely demonstrated, but there was great probability of that conclusion that was true.

AMONG the many phenomena for which the broiling sun of July is probably answerable, that of presenting the Röntgen rays in a new and somewhat grotesque light is one of the most curious in certain of its consequences. A number of eminent *savants*, French and American, says the *Daily Telegraph*, maintain that the X rays possess various mysterious virtues, such as that of killing microbes in the blood in the lungs, &c., and MM. Lorney and Genoud lately communicated to the Académie des Sciences the results of certain of their numerous and successful experiments, tending to show that even tuberculosis is mitigated and arrested by their influence—a statement which is categorically denied by an Italian bacteriologist, Sornani, who subjected no less than sixteen varieties of bacteria to the action of the rays, and discovered that the microscopical little scourges merely basked in them. Another enterprising Frenchman, from Dijon, having read that Professor Vanderbilt, of Tennessee, is of opinion that the X rays, if caused to penetrate the human skull, utterly destroy the roots of the hair, making havoc of the most luxuriant tresses, and leave the patient bald for life, hurried to Paris to make a fortune by applying the discovery. Not, of course, that M. Gaudoin was simple enough to fancy that the population would crowd to his ante-chamber and pay him royally for inducing baldness. Nature has provided numberless cheap ways of attaining that particular result. But he was aware that a considerable proportion of his countrywomen are, if not precisely born into the world, at least early endowed, with soft, silky moustaches, which, although eagerly yearned for by the masculine youth, are by no means appreciated by marriageable young girls, or even married ladies. He resolved, therefore, to use the Röntgen rays as a *dépilatoire*, to remove the superfluous hair from their lips, and, when needful, from their chins. Having discreetly made known his benevolent intention, he was not long in getting fair customers. They flocked into his laboratory, patiently awaited their turn, cheerfully paid their fees, and received the invisible rays on their full-blown moustaches and incipient beards But these hirsute appendages made no sign of vanishing, and one young lady who had been under the treatment asked to have her money back. Another lady, a well-developed widow from the Halles, whose moustache and beard ought to make her fortune at country fairs, told the operator that, if he had not found an infallible *dépilatoire*, she had, and, pointing to her fingers and nails, informed the scared scientist that she would operate on the exiguous hairs of his devoted head unless he then and there refunded the money. M. Gaudoin appeased these infuriated Graces, and hurriedly retired from the business with the fees he had accumulated.

THE BRITISH GUIANA GRAPHIC CLUB.—Elsewhere in our columns we print a letter from an old friend of the JOURNAL, Mr. H. H. Cunningham, President of the British Guiana Graphic Club, also a paper by one of the members. We append some interesting extracts from the local press relating to a recent Exhibition of the Club: "THE GRAPHIC CLUB.—The members of the above Club are at present holding an Exhibition in their studio in Main-street, where the artistic productions of the members, comprising photographs and paintings, are on view. There are three classes of pictures—landscape, portraits, and paintings. In the two former, Mr. Anson, of Morawhanna, has some conspicuously good platinotype photographs of typical scenes in the interior. The groups of aboriginal Indians are exceptionally fine, and his picture of the Barima Mine conveys a vivid impression of the famous property on which the immediate future of the gold industry in this colony will so much depend. Mrs. Fred. White exhibits some photographs which fully maintain the reputation she has won as a distinguished lady amateur, and her study representing two little boys fishing in a trench, where the Victoria Regia is growing in profuse luxuriance, is one of the most effective things of the kind we have seen. The members are quite up to date, and on the walls are hung photographs of the latest spectacular sights that the city has afforded, including the swearing-in of Sir Augustus Hemming, and the fire at Messrs. Sandbach, Parker, & Co.'s premises. Mr. F. A. Conyers exhibits some very fine impressions, notably a graphic scene taken from the Botanical Gardens, entitled, *When Shades of Evening Fall*. Mr. H. H. Cunningham (the President) exhibits an oil painting of Kaieteur Fall, and Mrs. Bellairs and Mrs. George Garnett have also some pretty studies in oil. . . . . In connexion with the Exhibition of the Graphic Club, to which allusion is made elsewhere, the Chairman and members held an "At Home" on Saturday evening. A large number of invited guests, which included His Excellency the Governor, took advantage of the opportunity thus afforded them to view the Exhibition, which evoked general expressions of admiration. Many, too, were not a little surprised to learn that such a strong amateur organization exists in the city, with members capable of turning out such excellent and highly finished work. A ballot was held during the evening, and as the result of it the following artists were awarded the palm:—Class A, Views, Mrs. F. White (for the picture of two boys fishing in a city trench); Class B, Portraits, Mrs. F. White (portrait of a little girl); Class D, Paintings, Mr. H. H. Cunningham (the Kaieteur Fall). We trust this Exhibition will be the means of inducing many others, who either paint or go in for amateur photography, to join the Club."—*Demerara Daily Chronicle.*

Patent News.

The following applications for Patents were made between July 15 and July 22, 1896:—

X Rays.—No. 15,554. "Improvements in and relating to Apparatus for the Application of the Röntgen X Rays to Human Beings, Horses, and other Animals." V. E. Johnson.

Screen Kinetoscopy.—No. 15,603. "Improvements in or relating to Apparatus for Use in Taking or Reproducing Animated Pictures." H. J. Heinze.

Printing Machinery.—No. 15,781. "Improvements in Photo-printing Machinery." Complete specification. L. M. Schmiers and J. D. H. Stein.

Lantern Tinters.—No. 15,804. "Improvements in the Method of Producing Coloured Glass Lights for Lenses, also applicable for other suitable purposes." J. Davis and A. J. Davis.

Developing.—No. 15,847. "Improvements in Apparatus for Developing Photographic Plates." W. Brookes.

Printing.—No. 15,852. "Improvements in Chemical Compositions for Preparing the Surface of Suitable Material for Photographic Prints." E. P. Schoenfelder and E. Kehlf.

Developing.—No. 15,929. "Improved Apparatus for Developing Photographic Films in Rolls." A. M. Thompson and W. W. G. Webb.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
3	Borough Polytechnic	Excursion: St. Albans.
3	Croydon Microscopical	Excursion: Chilworth.
3	North Middlesex	Exc.: Cambridge. Leader, H. Walker.
3	South London	Exc.: Eynsford. Leader, H. Goodwin.
5	Borough Polytechnic	Open Evening.
5	Photographic Club	The Use of Small Cameras, and the Making of Enlarged Negatives.
8	Borough Polytechnic	Excursion: Neasden and Harrow.
8	Croydon Microscopical	Conversational Meeting.
8	Gospel Oak	Excursion: Richmond.
8	Hackney	Excursion: Holland Park Gardens or Painer Wood. Leader, J. Gardner.
8	Oldham	Excursion: Moreton Hall. Leader, W. A. Nash.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

July 23,—Mr. A. Haddon in the chair.

Wellington's Negative Paper.

Mr. J. E. Hodd passed round a negative and a print from the same, taken on Wellington & Ward's new negative paper, which was to be distinguished from their stripping film, as the emulsion with which it was coated was not removed from the paper support after development, but the printing done through the paper. It was not intended that the negative should be waxed for printing, and, in fact, he found that course objectionable. It was easy to work, and printed in about the same time as a glass negative. He had found no trace of halation, but said there was a tendency to blister. He mentioned that he had used no alum.

Mr. Kellow pointed out that alum was recommended by the makers, and would probably do away with the blistering.

The Hon. Secretary understood that Mr. Wellington advocated a very short exposure of the back of the paper to light, so as to obviate any grain in the negative by filling up, so to speak, the small inequalities in the paper. He considered that for carbon printing the trouble of making reversed negatives was overcome, as one could print from either side.

Mr. A. L. Henderson read a paper entitled

What is it?

[see p. 490].

The Hon. Secretary recently used some slides, which he had possessed for about seven years, with some very rapid plates. Two of them developed soon after exposure, came out quite correct, but the others, which had been left for four days before development, exhibited a band across each near the position of the hinge, although not very marked.

Mr. Hodd gave some further experiences he had had with his dark slides in the presence of their maker, and, although the plates had never seen daylight, the band still appeared. He showed some of the hinge material and the black varnish, which was composed of gold size and dead black.

The Chairman remarked that turpentine would repel the developer and prevent its action, but, if dissolved off with ether and the plate washed, the developer would be able to effect its object.

Mr. Welford said years ago he had subjected a dark slide to very hard treatment by putting it into a damp cellar for a time, and then inserting a plate, and exposing to the sun's rays until the moisture had condensed on the plate, but was unable to trace anything to this treatment.

The Chairman detailed some experiments which had been made, showing the persistence of the action of the X rays. A number of articles were placed on a card box, in which was a sensitive plate, and an exposure made. Subsequently another plate, treated in the same box, but without the objects, showed, on development, reproductions of these objects, which had been removed, and which was due, he believed, to some constituent of the cardboard.

PHOTOGRAPHIC CLUB.

July 22.—Mr. Frank Haes in the chair.

Mr. Welford passed round a copy of the *St. Louis and Canadian Photographer*. This photographic journal is illustrated with a series of sixteen pictures, showing the ruin inflicted upon the city of St. Louis by the tornado which struck the city. Mr. Welford also passed round a considerable number of snap-shots of the Convention. The negatives were developed and prints made in forty-eight hours.

Mr. Wallis showed some Daguerreotype plates, the tarnished surface of which he had endeavoured to repolish. Failing in this, he had replated them, but the result was not successful, the metal being, apparently, too thin to stand the burnishing of the silver deposit.

Brixton and Clapham Camera Club.—A meeting was held on the 21st inst., the greater part of the time being occupied in examination of the prints sent in for the recent quarterly competition, and a study of the criticisms which the Judge (Mr. Horsley Hinton) had been requested to make. The bronze medal, presented by the President, was won by Mr. F. W. Levett, Mr. J. Gunston being second, and Mr. G. W. Welham third.

North Middlesex Photographic Society.—July 20, Monthly Instruction Evening, Mr. Smith in the chair.—Mr. S. E. Wall gave a demonstration on

Bromide Printing.

Speaking of the kind of paper to use, he preferred rapid paper when artificial light is to be used, and slow for daylight. He found it an advantage, when enlarging by daylight, if the light was very bright, to tone it down by means of several sheets of tissue paper placed between the light and the negative, until a Watkins' exposure meter took about 100 seconds to turn to the standard tint. He advocated the free use of matt varnish and judicious pencilling on the negative to get the best effects. If the negative was at all weak, use a weak light, and a good light for a strong negative. He found Eastman's rapid paper registered about 35, Watkins' and Wellington's about 30. He liked rough bromide paper, but found it more liable to blister than smooth. He thought there was more latitude in exposure in bromide paper than in a dry plate, and ferrous oxalate was better to use than hydroquinone, and less liable to fog, and a mixture of old and new developer gave better results and was more under control. Hypo 1·200 was a good accelerator, but wanted careful using. Too much bromide gave a nasty greenish tone. The paper should be carefully washed after the acid bath before fixing, and, if hydroquinone had been used, the addition of bisulphite of soda to fixing bath got rid of any stain. He passed round some fine examples of his work, and then developed two prints, keeping back certain portions by partially drying with a spill of blotting-paper, and using a small quantity of developer. After replying to several questions, a hearty vote of thanks was accorded to the lecturer.

July 27, Mr. Marchant in the chair.—Mr. J. T. Sandell read a paper on

Anti-halation and Latitude in Dry Plates.

He sketched the various methods used to combat the evil of halation, and contended that the best method of overcoming it was by means of multiple films, as found in Sandell plates. These plates reduced the simplicity of development to a minimum. All that was necessary was to immerse the plate in the developer (several, having different exposures, could be developed in one dish) for a certain time, according to the strength of the developer; take out and fix. If any were too dense, they could be reduced with potass ferridcyanide. He developed three plates together in a dish, an interior, fifteen minutes exposure, and a landscape, one having one second and the other sixteen seconds. He passed round some magnificent prints taken from Sandell plates. In reply to a question, he said a yellow screen could be used with benefit with exposure three or four times that given with isochromatic plates.

Stockton Photographic Society.—At the monthly meeting, held at the Royal Hotel, on the 21st inst., the chief incident was a presentation to the Hon. Secretary (Mr. J. E. Ellam), who is leaving the district. The gift consisted of a silver cigarette case bearing the inscription, "Presented to Mr. J. E. Ellam by the Stockton Photographic Society, 21st July, 1896," and a silver-mounted walking-stick. The President (Mr. W. S. Fothergill), in handing them to Mr. Ellam, said that he hoped they would in after-time serve to remind him of his old friends in Stockton. A letter was read from Dr. Stainthorpe, of Saltburn, regretting his inability to be present, and expressing his sense of the loss to the Society which Mr. Ellam's removal would cause. Eulogistic speeches expressing admiration for Mr. Ellam's skill and gratitude for his help—which were ever at the disposal of members both in the way of demonstrations before the Society and advice in cases of individual perplexity—were made by the following gentlemen: Messrs. W. Downs (Vice-President), J. H. Jackson, F. L. Dodds, M.A., Thomas Watson, M.D., H. Bradley, G. F. Allan, and J. Bowron. Mr. Ellam thanked the members for their present, assuring them that, while nothing of the sort was necessary to keep him in mind of his long and pleasant association with the Stockton Society, he greatly appreciated this mark of their esteem. He further promised a demonstration of carbon printing for the next meeting if he should be within reach. Regret was expressed that Mr. H. Bradley (a Vice-President) is also about to leave, and a hearty farewell was bidden to both members.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

TRAILL TAYLOR MEMORIAL.

To the EDITORS.

GENTLEMEN,—As the time for closing this fund is now at hand, I shall feel obliged if you will allow me, through your columns, to ask those who have not already subscribed, and who intend to do so, to send me their subscriptions at once; and, further, may I ask that Hon. Secretaries of societies, and others who have subscription lists open, will, at their earliest convenience, let me know the amounts they have in hand so that I may be enabled to report to the Executive Committee, with some degree of accuracy, the total sum to be dealt with.

Your readers will already have learnt, from your report of the Photographic Convention, that that body, at their annual meeting, voted twenty guineas to the fund.—I am, yours, &c., ALEXANDER MACKIE,

3, *Upper Baker-street, N.W.* *Hon. Secretary to the Fund.*

ORTHOCHROMATIC PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—On looking over Mr. Bothamley's Convention paper on Orthochromatic Photography, as given in the last week's issue, I find therein some criticisms referring to a communication of mine upon the same subject.

Mr. Bothamley states that the main conclusions from my experiments are vitiated by the fundamental error of adding a much larger quantity of dye to the emulsion than would enter into intimate association with it. He also states, without any modification, that the method adopted was to add a definite quantity of dye to a definite quantity of emulsion.

This is true only for a limited number of the dyes used.

I always tried to avoid the optical, as distinguished from the chemical, method of sensitising, and only resorted to the former when I found the latter impossible. In a chemically sensitised emulsion I maintain that the dye compound of silver and the bromide of silver are as closely associated as in an ordinary chloro-bromide emulsion, no matter the relative proportion of silver dye compound and silver haloid or haloids.

Regarding Mr. Bothamley's remark with reference to the extremely small quantity of dye required to produce "maximum sensitising effect," I would prefer to say "maximum general sensitising effect," for the maximum sensitising effect of a dye can be increased by adding a larger quantity of the dye, and this latter method I have frequently had to employ so as to get results that I could interpret photographically. I do not therefore agree with Mr. Bothamley when he says that the quantity of dye added was much larger than could enter into intimate association with the silver bromide. The quantity may be large or small within certain limits, and yet always associated with silver bromide if the emulsion be properly prepared.

In the near future I propose giving a further communication on this subject, and hope to prove conclusively that the position of maximum photographic effect of a dye is somewhat nearer the red end of the spectrum than its maximum absorption.—I am, yours, &c.,

Cricklewood, N.W., July 27, 1896. J. J. ACWORTH.

PHOTOGRAPHY IN BRITISH GUIANA.

To the EDITORS.

GENTLEMEN,—You used to know me in your pages, and I still read them; but, since residence in the tropics, I have been able to do little for photography except locally.

The amateurs here are gathered under a club, called the Graphic Club of British Guiana, which, though it includes some who paint and model, is mainly confined to photographic amateurs. Our title, as you will see, includes all sorts of "graphing." We number some thirty or forty members, and meet monthly for the hearing of papers on subjects of local and photographic interest, and for discussion (much as English societies do), in our own premises in Main-street, Georgetown, where we have a dark room and studio.

I send you a paper lately read by Mr. Perkins, F.R.G.S, one of the members who was the first to climb, along with Mr. Everard Im-Thurn, that strange mountain, on the borders of British Guiana and Brazil, called Roraima. It has been lately climbed again by Mr. Quelch and Mr. F. M'Connell; and they, by passing a night on the top, were able to secure better photographic and other records of its peculiarities.

Photography in this damp climate, with a temperature of 80° to 90° Fahr., is quite another thing from photography in England, and one's trials are many—bacterial growths attack, and render worthless, plates in a fortnight, and consequently dealers can't keep more than a small stock; thus one is often at a loss for a plate, and when a good subject occurs lose it. Nor does printing paper keep any better, and I leave you to judge of platinotype. Still, we do our best, though sulphurous language gives a tone now and then.—Yours, &c.,

H. H. CUNNINGHAM, J.P., B.A.

Georgetown, British Guiana, July 7, 1896.

ART *versus* MECHANICAL PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—At a time when so many are complaining that photography is being thrust on one side by cycling, and that the ranks of the latter are increasing at the expense of the former, it will not be amiss to ask the question, Have we more than a mere handful of men and women occupying themselves seriously with the subject, and going beyond the mechanical manipulations, which are at the best only a means towards the end, the expression of art through the medium of the camera? I have come to the conclusion that the number of those possessing more than a mere transient interest in photography is very small indeed; for, considering either the societies, the exhibitions, or the journals, everywhere, excepting in a few rare instances, one finds the eternal supremacy of matters relating to the advantages of different forms of apparatus, the merits of rival processes, the trivial details of manipulation, and but rarely those relating to the principles of art, the education of the eye, and the cultivation of artistic qualities. In this manner do we occupy ourselves, for ever worrying about the paints and brushes, or the canvas, while the Goddess of Art is sleeping on our doorsteps, waiting to be let in.

The time is ripe for a great development of pictorial art in photography, if only photographers will arouse themselves and become alive to its possibilities. There is a need for good teachers of photographic art; we have ample means of learning the rudiments of manipulation. Cannot the Linked Ring, our only organization which has grasped the artistic potentialities of photography, arrange for a course of lectures in London and the provinces? They have put an ideal before us, will they now help us towards attaining it?—I am, yours, &c., MATTHEW SURFACE.

Bradford, July 24, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

John Lander, 24, Division-street, Sheffield.—*Two photographs of gun shield.*

John Lander, 24 to 30 Division-street, Sheffield.—*Photograph of tied steel test.. Photograph of spiral steel test.*

ADDRESS WANTED.—NORMAN VINE. We do not know the address, but he is a Leeds man, and probably Mr. Godfrey Bingley, Thornichurst, Headingly, will tell you where he lives.

PLATINOTYPE.—HANTS. With paper the colour of that sent it will be quite useless to attempt to get prints with anything like pure whites. It has clearly been exposed to damp, as the makers say.

ROYAL ARMS.—DOUBTFUL. Supplying photographs to the Royal family under the conditions mentioned certainly does not entitle you to put up the royal arms. To use them you must obtain the Royal Warrant to do so.

LENS.—C. WELLS. The lens, as the prints show, is a very good one; but you are expecting too much from it. A lens of four and a half inches' focus will not cover a quarter-plate sharp up to the corners with its full opening of *f*-5·6.

PHOTOGRAPHING HYMNS.—G. S. says: "Will you tell me if permission is required to photograph hymns for magic-lantern slides—*Hymns Ancient and Modern* and Moody and Sankey's?"—In reply: Yes, if the hymns are copyright.

PHOTOGRAPHING IN HYDE PARK.—HARD UP. You will certainly not get permission to take either ferrotypes or glass positives of the equestrians in the "Row." Itinerant photography is not allowed in Hyde Park, or, indeed, in any of the royal parks.

STAINS ON NEGATIVE.—OXON. The stain on the negative enclosed is caused by imperfect fixation—that is, the whole of the unaltered bromide has not been dissolved out. As the negative has been printed from several times, nothing can now be done with it to remove the stain.

STUDIO.—M. CARPENTER. Either fix on 1 or 3 form of studio in preference to any of the others for general all-round work. If you are likely to do many groups from time to time, the latter form might prove rather the better of the two, but so little as not really to be worth much consideration.

FRILLING.—T. SHEANN. This is simply a hot-weather trouble, though we have never suffered from it with the brand of plates referred to; but we are careful not to handle them with warm fingers more than we can help, as all plates are liable to frill more or less with such treatment in such weather as we have been having of late.

METHYLATED SPIRIT.—A. C. V. In all probability the seller has not deceived you. It does not follow, because the spirit is rendered turbid on the addition of water, that it is "finish." All the methylated spirit now sold retail at oil shops becomes turbid if mixed with water, owing to the compulsory admixture of mineral oil with it.

LEARNER AND HOLIDAYS.—S. WEEDON.—If you made no arrangement, when the agreement was signed, as to holidays, you are not entitled to any; but most employers give their hands a week or so during the year. Probably yours may do so; but, of course, it must not be expected at his busiest season, and that seems to be what you are complaining of.

COLLODION PROCESS.—THOS. COLLINS. The formulæ for collodion, as given in the ALMANAC, are quite right. Probably your failure is due to your not keeping strictly to temperature and time, imperative conditions in the manufacture of pyroxyline. Why not purchase your collodion ready-made, that is what nearly every photographer did, and does now?

CRACKED PRINTS.—S. RICHARDS. The prints are, as you say, in a sorry plight, but their state is not at all unusual with some of the very highly albumenised paper, if the prints are allowed to dry *and curl up* this hot weather. Prints on that kind of paper should be dried between blotting boards, so that they are kept flat the while, or be mounted while they are wet. In either case there will be no cracking.

CARBON PRINTING.—W. S. READ. Your difficulty is distinctly traceable to the hot weather. The water in which the prints were soaked in prior to mounting them, the support upon which they were developed, were too warm. This water should not exceed 65°, or trouble may be expected. Water at this temperature is not difficult to obtain, as a rule. If it is in your case, a few lumps of ice will supply all that is necessary.

POISONS ACT.—PROVINCIAL PHOTO-DEALER. No, you will be acting illegally if you sell solutions for intensifying negatives which contain either bichloride of mercury or cyanide of potassium. That Trade Union, the Pharmaceutical Society, will be down upon you for their penalty. It is only members of their body that the law allows such things to be vended by, although they, as a rule, know nothing of their uses or their properties.

RED PRINTS.—A. S. B. writes: "Would you please to favour me with the formula of the toning bath, also what paper is used to produce prints similar in tone to the colour of the printing on the enclosed tissue? I have seen prints similar to this (but, if any difference, not quite so red), and like them very much, and should like if you could favour me with the information."—The prints so much liked are, doubtless, by the carbon process, and the tissue used is what is known as "red chalk tissue."

STARCH PASTE.—P. Z. L. S. asks: "Can you tell me what I can put in my starch for mounting prints to prevent it from turning sour, and at the same time have no injurious effects on the photographs?"—Carbolic acid or salicylic acid will prevent the starch from going sour; but we do not recommend any antiseptic to be used, as starch is so cheap and the paste so quickly prepared. Freshly made starch is more adhesive and better for silver prints than stale starch made containing foreign matter.

ENAMELLING SILVER PRINTS.—A. B. says "he would like to know if there is any method of making collodion to enamel silver prints cheaper than using the ordinary enamelling collodion and thinning solution, or whether vitriol can be used in part?"—"Vitriol" certainly cannot be used in place of either the ether or the alcohol. There are no cheaper solvents for the pyroxyline than methylated ether and alcohol. The latter may be the methylated if it is free from the mineral spirit, and of not greater specific gravity than ·820.

EXPOSURE.—S. A. JONES. To take a group of a couple of hundred people in a "fairly lighted" hall is not an easy matter. We can give you no idea what would be a proper exposure, although you tell us the lens and stop, and the plates to be used. "Fairly lighted" at six in the evening is too vague. What we should recommend you to do is to make one or two exposures in the hall a day or two beforehand under the same conditions as the picture has to be taken. Then you will be in no doubt as to the exposure required.

RESIDUES.—RESIDUE says: "1. I save all fixing baths from plates in an earthenware jar. Can I throw the silver down with hydrochloric acid, or what would be the easiest way to collect the residue ready for the crucible? 2. I also save the first washing of prints—P.O.P.—and put this in with the above old fixing bath. Is this all right?"—In reply: 1. It is better to precipitate the silver from old-fixing baths with sulphide of potassium (liver of sulphur). 2. It is preferable to keep the washing waters separate, and throw down the silver from them with hydrochloric acid or common salt.

FADING PRINTS.—HERTS AMATEUR says: "I sent some negatives to a professional printer about a year ago to be printed on gelatine paper. At first he demurred to doing them on that, and recommended me to have them on albumen instead. However, I insisted on their being on gelatine, as I preferred it, and got them. Now many of them are turning yellow, and, on complaining, he says he is not surprised, and that I should have had them on albumen, as he recommended, and he will make no recompense. What can I do?"—The only thing we can suggest is to sue for the amount paid, and produce expert evidence that the yellowness is due to his work, and not to the process—a somewhat difficult matter.

EXPIRATION OF LEASE AND REPAIRS.—R. C. W. Without seeing the lease, we can give no definite opinion; but if there is a clause in it, and most probably there is, as in most leases, that the premises are to be left in good repair, the tenant will have to put them in good repair. That the landlord has not troubled about the condition of the premises during the fourteen years till now is of no moment, and no defence to not leaving them in good repair at the end of the term. That must be done if it is in the terms of the lease to do so.

INKY TONES IN BROMIDE ENLARGEMENTS.—W. SEARLE writes: "I enclose some pieces of bromide enlargements to show you the cold, inky-like tones I frequently get. I use the iron developer recommended by the makers of the paper. Sometimes I get very satisfactory colours, but more generally such as these, and all with the same developer, for I use no other. Is it likely that the paper is mixed?"—Very unlikely indeed. The difference in colour is entirely due to the exposure. The examples enclosed are all under-exposed, and have been forced in development, hence the cold tones. The others, the colour of which was good, doubtless, received a proper exposure.

REPAIRING LEASE.—R. W.—So far as we can see, your landlord is quite right in his claim, though we can give no opinion as to whether the amount is reasonable or not. In taking the premises, you signed the lease, for seven years, agreeing to paint the outside of the premises once during the term, and the inside twice. It seems that you have only fulfilled your part of the contract once with regard to the inside, and not at all as to the outside. This will now have to be done, although you will reap no benefit therefrom. Had it been done before, you, of course, would. You will also have to make good all dilapidations as well. We should advise you to come to terms with the landlord, for if you do not, and he appeals to the law, you will be certain to be the loser.

DESIGN FOR STUDIO.—STUDIO writes: "I beg to enclose a plan of a studio I propose building shortly. I would be very much obliged if you will give me your opinion on it, and also answers to the following:—1. Is the slope of roof sufficiently steep? I have extended the roof one foot, as you will see by the plan, to shade the roof (glass) from sun, as studio cannot be shaded on south side. It will face north, with house on east end. 2. What material is best for blinds in studio, and best colour?"—1. The design is very good, and the only suggestion we can make is that the roof might be extended a little more on the south side, so as to shield off the sun more at midsummer. But that is not really necessary, as it would only be advantageous for a month or two in the year. The slope of the roof will do quite well. 2. A light green or dark blue window holland will be very suitable for blinds.

STEREOSCOPIC PHOTOGRAPHY.—AD VALOREM writes: "I shall be greatly obliged if you will give me information as to the *pros* and *cons.* of taking stereoscopic pictures by (1) twin lenses, (2) by mirror appliances. Will they (1) and (2) give equivalent results, &c.? I think a short article on the above subject would be appreciated by a number of the JOURNAL'S readers who have a lot of doubts on the principles involved."—In reply: We shall probably have an article on the subject shortly. In the mean while we may say generally, that, the employment of the double reflection principle in stereography obviates the cutting or transposition of the prints—gives you, as it were, a direct stereoscopic result, the effect of which is practically as good as that obtained by twin lenses and transposition; but the binocular method has advantages which make it *par excellence* the best system of taking stereo-photographs.

TONING.—E. BATT says: "I shall esteem it a favour if you could oblige me by letting me know what formulæ I should use to obtain a good purple-black, or, what I mean, next door to over-toning? I have tried the ordinary sulphocyanide and gold bath, and sometimes obtain the above colour in this bath, but, on immersing in the hypo, the prints change to a brown, although, when dry, they are a shade better, and dark, but not much. Should you advise the combined bath, and tone till I get the colour, or can you put me up to a trick so as I shall be able to obtain always the one colour—a blue-black? Also, if you could suggest my purchasing any particular book that would give me a few hints on toning, I shall be thankful. It seems to be my great misfortune, 'toning;' everything else seems to go quite correct and smoothly."—In reply: 1. Possibly the phosphate bath will give the tone you want. The formula is: Gold chloride, 1 grain; phosphate of soda, 20 grains; water, 8 ounces. It gives tones of a deep purple nature, but must be used soon after preparation. We have used this successfully ourselves. 2. We do not recommend the combined bath. 3. We know of no book specially devoted to the purpose, but Abney's *Instructions* may help you.

THE X RAYS.—DR. G. LINDSAY JOHNSON writes: "I notice in this week's (July 24) number of THE BRITISH JOURNAL OF PHOTOGRAPHY, under Answers to Correspondents, you state: 'The Röntgen Rays and Consumption.—H. R. Sharples. Your doctor was quite right; the X rays are not germicidal.' I think your reply is certainly at variance with my experience. I enclose a cutting from this week's *British Medical Journal* which fully bears out my results."—In reply: We were aware of Lortet and Genoud's experiments with inoculated guinea pigs, but we believe we are correct in stating that the preponderance of medical opinion so far is opposed to the X rays having any germicidal effects—that is, for curative purposes. Dr. Lindsay Johnson will probably be interested in the following extract from the *Daily Chronicle* of Monday last: "We referred last week to some experiments made to test the action of the Röntgen rays on tuberculosis. M. F. Berton has recorded before the Academy of Sciences some trials of the effects of the rays on the diphtheric bacillus, unfortunately without favourable results, as no attenuation of the virus could be obtained by exposure to the rays for forty-eight hours." We shall, however, be glad to know definitely that Dr. Lindsay Johnson's own experiments have been successful.

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EX CATHEDRÂ.

Photography, in the person of Mr. W. Downey, of the well-known firm of W. & D. Downey, was highly honoured on the occasion of the festivities held in connexion with the marriage of Princess Maud of Wales. Mr. Downey received an invitation to the royal garden party, and Her Royal Highness the Princess of Wales sent him a written permission to privately inspect Princess Maud's presents. This recognition of photography at one of Royalty's most important functions will, we are sure, be much appreciated throughout the profession. It adds another to the many marks of encouragement and support that photography has received from the members of the reigning House.

* * *

Messrs. Elliott & Son, of Barnet, inform us that their new factory for the manufacture of photographic papers is now complete. They have already coated over a mile of "Barnet" platino-matt bromide paper in it. The building is seventy feet in length, and, as a precaution against fire, is quite isolated from the dry-plate factory. The new machinery is a great improvement on the old, and the same may be said of the ventilating and drying arrangements. The new factory is believed to be the most perfectly fitted of its kind.

The Annual Meeting of the Photographic Copyright Union will take place on Thursday, October 8 next. The date has been chosen in order to give country members who may be in London at that time for the purpose of inspecting the Photographic Society's Exhibition an opportunity of also being present at the Copyright Union meeting. Last year a great deal of useful work in connexion with the revision of the rules and other important matters was got through at the annual meeting. The attendance was large, and much interest was manifested in the proceedings. We anticipate that this year's meeting will excite equal, if not greater, interest among photographers.

* * *

The value of photographs as evidence was never more strikingly illustrated than in the following case, which we quote from an American contemporary, relating to the hearing of the Senate Investigating Committee at Philadelphia on June 26, which was enlivened by the introduction of the Citizen Municipal Association, of a series of instantaneous photographs, in their efforts to show the interference by the police at the municipal election in February last. During the course of the hearing, Charles W. Crane, of Trenton, a photographer, was asked to identify eight large photographs representing scenes on election day, last February, outside the polling place of the sixteenth division of the fifth ward. The views showed policemen standing on the steps of the polling booths and talking through an open window to persons inside. Mr. Crane said that before seven o'clock in the morning he took his station at a second-floor window of a house just across the street, and he took the photographs at intervals during the day without any one in the street being aware of his presence.

* * *

It is not reported what effect the production of these photographs had upon the Investigating Committee, but it appears that many other similar photographs were identified; indeed, the police were systematically shadowed by means of the camera. Happily, on this side of the Atlantic, occasion rarely arises for the employment of photography to prove interference with the rights of citizens.

* * *

It is probable that ere long more than one "substitute" for celluloid as a support for the sensitive film will be placed on the market. With that end in view, we are aware of experi-

ments being conducted by three dry-plate makers with three different, if not wholly dissimilar, substances. A sample of one of these proposed substitutes was recently shown us by Mr. Conrad Beck, who tells us that it is to be employed for Frena films. In appearance and degree of flexibility this strongly resembled celluloid, although we were not informed of its composition. On the other hand, we were assured by a well-known film-maker that a perfect substitute for celluloid had yet to be produced. It is also open to doubt whether, except as regards cost and some few unfavourable experiences of the keeping qualities of celluloid films in hot climates, there exists a real necessity for the displacement of celluloid. The slowing of the emulsion, the destruction of the undeveloped image, and spontaneous fog in hot climates are faults that have been urged against celluloid films; but the evidence adduced has not been conclusive. As regards the keeping qualities of celluloid films under normal conditions at home, we seldom hear any objection urged. Recently we exposed and developed some celluloid films that were five years old, and their good qualities were unimpeachably good.

* * *

"Sitting for a Picture" is the title given to a series of hints, intended for those about to be photographed, that recently appeared in a contemporary. Our professional friends will, no doubt, be interested in the instructions, which probably did not emanate from a photographic studio, and to some of which it would be easy to take objection.

* * *

"A veil imparts a patchy appearance to the face. Gloves make the hands appear much larger than they are in reality. It is unwise to wear a new dress; it always falls in awkward folds. Whenever possible, it is money well spent to drive to the photographer's. A feather boa or a lace fichu has a wonderfully softening effect on the features. Generally speaking, the head and shoulders make a far prettier picture than a full-length portrait. Above all, if you want your sun picture to have a natural expression, you must forget where you are. Unless there is any urgent reason for it, it is a great mistake to be photographed if you are either out of health or in low spirits. A just-the-mode-of-the-moment style of costume or coiffure will 'date' the photograph, and soon make it look out of fashion. A white dress, or one that takes 'white,' gives a ghastly effect, and one far from becoming, unless the sitter is young and pretty."

* * *

The hints are clearly addressed to ladies, a fact which in itself justifies the assumption that they (the hints) are not likely to be attentively observed. Ladies, as a rule, pay little heed to photographic dictation in millinery matters.

ORTHOCHROMATIC PHOTOGRAPHY.

It is satisfactory to find that some of the leading supporters of the Photographic Convention have at last recognised that an annual gathering of this kind should, if possible, be made the occasion, as it was so aptly put by Mr. Bothamley, "to take stock, as it were, of the present position of our knowledge of particular branches of photography."

We should like to see the example thus set in the paper under the above title and in that of Mr. Haddon followed in years to come.

The two points directly raised by Mr. Bothamley are of considerable practical importance, and open up fields of investigation, which, however, are unfortunately beset with considerable difficulties. In the first place, there is considerable difficulty in obtaining pure samples of the dyes, for many of the commercial samples are loaded with impurities, either intentional or accidental. Further than that, it is well known that the haloid salts of silver differ considerably in their behaviour to various dyes, and therefore the experimentalist must either manufacture his own emulsion or else work with an unknown quantity in the shape of commercial plates.

With regard to the two hypotheses of the action of the dyes, the one that seems the more feasible, particularly in the face of Mr. Bothamley's experiment, is that held by Eder and Vogel. It is difficult, too, to accept the theory of the oxidation of the dye when we recall Eder's experiment, in which he added some eosine to a gelatino-bromide emulsion, and separated by a centrifugal machine, and washed the silver bromide three times in succession, till it showed no colouration, and yet gave a distinct sensitising maximum in the neighbourhood of the D line, which is so characteristic of it. Further than that, if the oxidation theory is correct, it would only be necessary to paint an unexposed dry plate with an oxidised dye to obtain a strong image. This experiment has actually been tried by Eder with negative results.

A solution of cyanine, which had been exposed for one year to light, and turned quite brown, and would therefore contain plenty of the oxidation products of cyanine, caused no reduction when painted on an unexposed plate and submitted to the action of a developer.

It may possibly be as well to call attention at this stage to a passage which occurs in Meldola's *Chemistry of Photography*, p. 320. After discussing the two hypotheses and explaining that the bleaching of a colouring matter may be due to photochemical oxidation, he goes on to say: "If this be the case, atmospheric oxygen may be essential for the production of orthochromatic effect, and the formation of a second maximum in the less refrangible part of the spectrum might be prevented by immersing the dyed plate in a reducing solution, or in some inert liquid or gas which prevented the access of air. Experiments of this kind might easily be made, and, if the action in the green, yellow, or orange, did not take place under these circumstances, the chemical hypothesis of orthochromatic photography would be raised to the rank of a proved theory; while, on the other hand, if the second maximum still appeared, this hypothesis would not be disproved, because it is possible that the breaking down of the complex molecule of the colouring matter by the action of light might take place in the absence of oxygen, and thus also give rise to the formation of products of a reducing character."

It is obvious from this that further researches upon the action of the oxidation products of the various sensitisers in the haloid salts of silver are required before we can obtain any satisfactory explanation of orthochromatic photography.

The second question, as to the coincidence of the maximum absorption with the maximum of sensitiveness, we do not intend to touch upon, except for the secondary point, and that is the screening effect of the dye used.

To attain the best results on colour-sensitive plates for all-round landscape work, it is generally admitted that a yellow screen is necessary, for the simple reason that, although we increase the sensitiveness of the silver salts to the less refrangible rays, yet the abnormally high blue and violet

sensitiveness atill preponderates. Why, then, should we not insert our yellow screen in the plate itself, and do away with the usual glass light filter, and thus make use of the very screening effect to which reference was made?

The idea of replacing the yellow screen by dyeing the vehicle of the silver salt is due primarily, we believe, to Dr. E. Albert, who some seven or eight years ago placed upon the market an orthochromatic collodion, the sensitiser for which was ammoniacal solution of silver eoside, any excess of ammonia being neutralised with pieric acid, the ammonium picrate thus formed acting as a screen. This idea was also suggested some years later by Vidal for gelatine plates.

There may be, of course, considerable difficulty in finding a dye which, whilst efficient as a reducer for the blue and violet, shall sensitise for the green, yellow, and orange, and if we have to resort to two dyes—one as sensitiser, the other as screen—another difficulty of the incompatibility of the two may stare us in the face. Eosine, which is at present the best sensitiser for yellowish-green, would, if used of sufficient strength to dye the film, cut down the green rays, for the absorption curve of this colouring matter commences at $D\frac{1}{2}E$, rises sharply to a maximum at $D\frac{3}{4}E$, and then, slowly sinking, stretches beyond F. Now, at E. we find there is always a sudden depression in the sensitiveness curve of all orthochromatic plates, and therefore the screening action of eosine would make bad worse. The same statement applies equally to cyanine, for, with a strongly coloured film, there is practically no sensitising action at D, where, without any screening effect, practically the maximum sensitiveness should lie.

The argument may, of course, be advanced that this placing of the screen in the film would lower the general sensitiveness; but, as, when a yellow screen is used, the exposure has to be prolonged, the necessary increase of exposure with the stained plate would not be a disadvantage.

DEVELOPING FORMULÆ.

Amongst the very numerous suggestions that have reached us in connexion with our article on this subject some weeks ago are several which aim more or less directly at the establishment of a universal or standard developing formula that shall be applicable, with slight modifications, to all brands of plates and to the different conditions of exposure, and the so-called "standard" formula of the Society of Amateur Photographers of New York is indicated as an example of what is required.

With regard to the feasibility of such a universal developer, we can only say, at the very outset, that that formula, or, indeed, any other, good or bad, will answer equally well for the purpose of a "standard" to be used under all or any conditions; in fact, to put the matter in the form of a *reductio ad absurdum*, the formula itself is not of the slightest importance, its practical value lying in the modifications made to meet the varying conditions under which it is used, if we may put it in that way. In other words, it may be said at once plainly to those who are in pursuit of the *ignis fatuus*, a "standard developing formula," that such a thing is impossible, unless we take plain water as the standard, to be varied by the addition of other substances as necessity may require.

Even in the days of wet collodion, when the sensitive films prepared by different operators, in spite of the differences in the collodion used and the strength and condition of the bath, possessed probably a far closer resemblance to one another than do the gelatine films prepared by different makers at the present day, there was no such thing thought of as a standard developer. It is true that the general strength of the developer in its normal condition for studio use was fifteen grains of ferrous sulphate to the ounce of water acidified with fifteen minims of acetic acid; but these proportions were by no means adhered to by different operators, even under similar conditions while the same operator would scarcely have employed the same solution out of doors that he used in the studio.

Considering, then, the wide difference that exists between the characteristics of different makes of gelatine plates, what probability can there be of the respective manufacturers combining to establish a universal formula; looking at the fact, too, of the widely different requirements that exist in the development respectively of a portrait in the studio and in an ordinary room, of a well-lit landscape and a dark interior, or, indeed, between any two subjects it is possible to select, how is it possible for any one maker to establish anything more than approximately resembling a standard developer, even for the plates of his own make and under ordinary and normal conditions? The published formulæ are those which the respective plate-manufacturers find to be the most suitable for their particular films under certain conditions—generally for portraits in the studio, and a comparison of the different formulæ given in our Almanac will sufficiently show how varied are the requirements of different plates, and how unlikely it is that any combination of makers will ever arrive at uniformity in this respect.

We are quite willing to agree with some of our correspondents in the belief that there is an unnecessary amount of divergence between many of the formulæ published, but then it must be borne in mind that different opinions may exist, and that, with one and the same plate, different operators may hold as many different views as to which is the best method of development. One may prefer pyro ammonia, another pyro soda, while others prefer hydroquinone, metol, or ferrous oxalate, and, to a large extent, this is but a matter of individual taste. It seems to be universally agreed by the most experienced workers that pyro ammonia still remains the most elastic—the best all-round developer, though pyro soda, in point of convenience, is, perhaps, the more general favourite. Perhaps the very best average of results, in competent hands, will accrue from the use of the first-named, but it is beyond doubt that, even at the present day, there are some plates on the market that require the most careful treatment when that form of development is used, whereas, with pyro soda, they will bear a considerable amount of rough handling, although that developer does not offer the same power and latitude.

But, taking any one particular form of developer, it is quite impossible to establish a standard that shall be capable of use with different kinds of plates, even under normal conditions. The combination of pyro, ammonia, and bromide, for instance, that would be a quick developer for one kind of plate, might possibly be an extremely slow one for another make, for it is well known that some films absolutely require a much larger proportion of bromide than others, while twice the quantity of pyro that would give a dense image on one plate would be insufficient with another. The same may be said with equal truth of other developing agents. With one kind of plates, for instance, metol may be used without bromide, and will give dense, vigorous images, while, under the same conditions, with another plate, a thin, grey, ghostly picture is all that results.

Until photographers give more attention to the study of development, and less to the search for an automatic method, there will be no possibility of arriving at anything like a standard, and, when any such is arrived at, it is perfectly clear that it cannot possibly be either a single solution or even a two-solution developer. For any given make of plate the necessity must always exist for more or less varying the proportion of alkali and reducing agent, according to the conditions of subject and exposure; consequently a single solution, or a mixture of two solutions in definite proportions, is only possible under one set of conditions; and, if the bromide be combined with either one or the other of the two solutions, circumstances may arise, even with the plate for which the mixture is specially intended, under which the relative proportions of the three ingredients get "out of gear." But, if the same solutions are to be used for plates of widely different character so far as the quantity of bromide they require is concerned, it will be quite impossible to preserve the correct proportion of the different ingredients without having three separate solutions.

This, in fact, brings us back to the old method, introduced in these columns a dozen or more years ago, under the name of "rational development," in which three solutions of definite strength are kept—ten per cent. solutions are convenient—and mixed *pro re natâ*. This we believe to be the nearest approach possible to a "standard" developer, but it, of course, necessitates at least some little trouble in calculation, if it does not lay any very great strain upon the mental faculties; but we fear that it is this necessity for thought and calculation that is at the bottom of the whole matter, and that gives rise to the cry for standard, or automatic, development.

It is probably the extreme convenience of pyro and ammonia in this style of development that gives that combination the first place in the estimation of the more careful workers. The ready solubility of pyro, and high developing value of concentrated ammonia render them extremely easy of use in strong stock solutions; while the lower degree of solubility of hydroquinone, metol, and similar substances, as well as of the carbonates, make ten per cent., or even less concentrated solutions, an impossibility. Still the same principle can be followed, and, if the makers of plates would, one and all, in addition to giving a definite formula for stock developing solutions, state, as some, at least, do, the quantities per ounce of developer of the different materials best suited to the plates under "nominal" conditions, then photographers would be within measurable distance of being able to deal with any kind of plate whatever with the minimum of trouble.

Eclipse Expeditions.—Sir George Baden-Powell's yacht *Ontario*, with a portion of the British Government Eclipse Expedition, sailed, last Friday, from Vardo for Mellor Bay, Nova Zembla. In view of the different expeditions now on the way, one is very much inclined to question if "old Sol," with all his previous eclipses, has ever been flattered by the attendance of so many English scientists, dilettanti scientists, and excursionists, as he is in the present one. It is to be hoped that these expeditions *de luxe* will end in a great acquisition to our present knowledge, and not make good an old adage, that "too many cooks," &c.

Kew Bridge.—This familiar object, so well known to Metropolitan artists, and some photographers (as adjacent to Strand-on-the-Green), is to be pulled down, and replaced by a new one. This would have been done long ago but that the Middlesex and Surrey County Councils could not be brought into agreement in the matter. That safety required a new bridge long ago, there is no question. While the new bridge is being erected, the old one will be replaced by a temporary one. As the commencement of operations will not be long delayed, those who wish to obtain pictures including the bridge should lose no time in taking them. Strand-on-the-Green does not seem to be so well known amongst photographers as it deserves to be, and we question if there is to be found within half a dozen miles of Hyde Park Corner so much real picturesque river scenery, and food for the camera, in so small a space, as there is at Strand-on-the-Green. It is easily come-atable by road, train, or boat.

The Spy Scare Still On.—According to a Dalziel telegram from Metz one day last week, two French tourists, father and son, who live in the suburbs of Paris, were arrested for taking photographs with a hand camera in the vicinity of the Fort Zastrow. The telegram concludes: "They were detained in custody pending the development of the negatives." We merely allude to the telegram for the purpose of once more impressing upon English photographic tourists who may just now be about spending their holidays abroad, particularly on the Franco-German frontier, which abounds in food for the camera, the inconvenience they may unconsciously incur. In the neighbourhood of every fort in this district there are always patrols, or sentinels, anxious for their services to be recognised at headquarters, and, if they happen to see any one with a camera, he is at once treated as a suspect. If he happens to take a view, even if the fort is not in sight, he is forthwith arrested, and has to submit to inconveniences, not to say, in some instances, indignities, and necessarily delay. These may sometimes form an amusing anecdote when relate at home, but they are best avoided when on pleasure bent.

The British Medical Association *versus* the Pharmaceutical Association.—Conventions and congresses are now apparently in full season—last week especially. Then, amongst others, two what may be termed, in a sense, trades union congresses were held, namely, that of the British Medical Association, and that of the Pharmaceutical Association. The former, however, scarcely comes under the title of "trades union," because it seldom exercises its privileges as such, though the latter, under the auspices of the Pharmaceutical Society, undoubtedly does to the fullest extent. It might be supposed that both these bodies would row in unison; but, from what took place at the congresses, it is clear they do not. The pharmaceutists complain that the "medicos" do not make the same use of drugs as they used to do, and at the same time insinuate that they know, from their training, very little about the chemistry of what they prescribe. The medicos, on the other hand, complain of chemists counter-prescribing, and condemn the practice of medicine by chemists and druggists, and suggest prosecutions against them under the Apothecaries Act.

THERE is no question that, if the medical societies were to put their powers in force against the pharmaceutical chemists in the same way that the latter do against those who infringe their trade rights, it would fare badly with them, one and all. Chemists and druggists supply medicines for all and every ailment when applied to for them, though they are not qualified to do so; but, if any of the informers, or spies, of their trades union can find, or induce, say, a photographic dealer to supply a small quantity of anything included in the schedule, such as bichloride of mercury or cyanide of potassium, he is forthwith sued, or threatened to be sued, unless he at once remits the five pounds' penalty and lawyer's fees. This many do to save further expense. Not long ago a firm of oilmen were mulct in a penalty of five pounds and costs for selling a well-known brand of "fly papers." This proves that only pharmaceutical chemists are qualified to sell fly papers. How long, if the matter were vigorously taken in hand by those concerned, would this trades-union monopoly exist?

DIGRESSIONS.

VIII.—Some of the Harvest.

Leaving out of consideration professional portraiture, the bulk of the annual crop of negatives will have been gathered in by the end of the month, and the Exhibition season, entering on its wild career, with those critics who want to hunt with the hounds and run with the hare still not able to answer the question, "Under which king, Bezonian?" The harvest it is, of course, not possible to estimate with anything approaching correctness, but some idea of the luxuriant crop may be guessed by a glance at one small field. It is estimated that over 5000 exposures were made during five days of the Convention week. The quantity, however, great as it is, will leave a considerable aftermath of exposed plates to be brought home from the autumn holidays.

The quantity of the produce we can approximately estimate by the output of material, and know it to be increasing and enormous, beaten indeed only by the marvellous run on cycles, and I would suggest that the manufacturers should take into consideration some liberal scheme of almshouses for those who spend their all in the pursuit of the art which is more profitable to them than to anybody else. Its quality, however, is to a great extent a matter of speculation or individual taste and judgment. Let us look over, or rather speculate over, the outcome of the year's work as far as the not very easy circumstances of the case will allow.

In professional photography, except in the hands of a few, I fear, something very like stagnation exists, but those few are moving. It seems to me that the usual photographer never does anything towards increasing his business, except in the usual objectionable way. He will tout, cut prices, "do 'em 'arf price during Whitsuntide," or for nothing every Monday, or if they will only come a thousand at a time, and advertise that his "goods" are the best in the market. It is only fair to say that these are lower down than the class I have in my mind at present. But I am afraid it is the middle class that is the stagnant class, the only effort at improvement they attempt being to imitate the works of others when they hear they are "paying;" there is never any attempt to break out in a fresh place, or improve the art for the art's sake; no accident ever happens to the middle-class photographer, and moments of inspiration are unknown. There are men who cannot make a bad picture, neither can they do a good one, and are fully content if they can do as good as their neighbours, and look in his window for a *lead*. Mediocrity is the saddest fate that could happen, if, indeed, it is not surpassed by the dreary sameness in the work of the photographer whose work is all alike at the highest level of mechanical perfection. Perfection easily becomes a calamity, especially when it is produced in quantity. It becomes a machine-made article, wanting in inspiration. I once heard a photographer exclaim, "Thank goodness, I can still make a thoroughly bad picture; it is not a lost art with me," and felt the lesson if I did not quite understand it at the time. I am not sure that the beauty of a good deal of the work of Rejlander and Mrs. Cameron was not so much in spite of, as because of, their faults. Absolute perfection does not match creation; it is unnatural; there is no blind spot in its eye. [This is not written for the youngest amateur, I don't want to demoralise him, and I hope he will skip it. He may trust himself not to be too perfect for some years.]

To resume. I don't believe that among the bulk of professional photographers there has been the least decrease in retouching of the worst kind, although its practice is falling off considerably among the better class, which I am afraid I am obliged to estimate at about a score; this is not encouraging. But there is an upper middle-class business about which I am beginning to hope, the class that I am afraid has been having the worst of it for years. The members of this class are certainly doing better, and more of them are showing at exhibitions. They are showing better work: they are using plainer backgrounds; the palm-tree is abolished; a full-length figure can walk about without kicking the crockery over. (I have seen a full-length figure which must have been built into its place with flower-pots to be photographed.) They show an appreciation of breadth of effect and simplicity. They acknowledge that they now see the necessity of reading works *on* art, as well as looking at works *of* art; they cannot suppress retouching all at once, it would be business suicide with an ignorant public, but they are personally disgusted with it as at present practised.

Of the residuum, the immense residuum, the makers of photograms, who set up their tents on the sands, I have seen nothing this year, but I hear they are as flourishing as ever. Neither can I say anything of process work, or radiography, two results of science which seem beyond the boundaries of our art.

It is the amateur who is the backbone of true photography, after all, but it requires some courage to say so, and it is pleasant to notice that the hand camera is gradually being raised from the position of a frivolous, or mischievous, or scientific, toy into the dignity of a serious tool for the production of pictorial photographs. This I notice all round. Among others there is a certain club whose excursions have lasted without default for between thirty and forty years, some members of which are conservative in the dimensions of their apparatus; but I have noticed during the last three or four years that the size of their cameras has been dwindling. The usual size used to be 10×8; when the wet process went out and gelatine came in, the weight was reduced to about 28 lbs.; now the $8\frac{1}{2} \times 6\frac{1}{2}$ has taken its place, and a hand camera often accompanies the older instrument, to take the chief place after a decent interval.

It is most gratifying to find that the art of the members increases as the weight of their tools decreases. There are only two now who talk apparatus where there once was a score, and even that is only about the internal machinery of hand cameras. But I must say that, when a camera "jams," the interest is intense, and all the coats in the company are instantly thrown on the ground to make a tent for half the unfortunate owner's body, so that he may rectify the machinery, which, like the assistant secretary I intended to have mentioned above, but will try not to forget again, would go wrong at a trying time. If anybody doubts this setting up of a dark room of garments, I can confute him, for I have all the incidents of such a chain of events duly set down in the art that cannot lie—although I am always trying to prove that the latter statement is a libel.

Thousands of half-plate negatives and snap-shots are, of course, still taken annually of many of our popular castles, abbeys, churches, ruins, and other objects which go under the heading of places of interest. But a change is coming over our amateurs. I visited, with a party of photographers, in early summer, one of our most picturesque mediæval towns, with church, castle, river, all complete. I noticed that the chief attraction was the river. I don't think a single plate was exposed in the church, one of the finest in England, and very few in the castle, although it was full of "objects." One member of the party found the top of the keep a capital place for getting clouds, and expended his plates in this way, although there was nothing very attractive in the sky at the time, rather than on Norman arches and mediæval architecture. The fact is, the advanced amateur has at last discovered that it is no longer interesting or profitable to take photographs of places of which he requires only a single copy, when he can get them beautifully executed for a single sixpence each, or, if he would be economical as well as encourage the foreigner, in "German" for the sum of one penny. He has at last learnt that more pictorial, if not such easy, subjects are better worthy of his camera; and he takes more interest in looking up little riverside bits, with cattle, sheep, or rustic figures, and gets his local views from the professional.

I said just now "beautifully executed" local views could be obtained. That, however, depends upon whether there is a local photographer in the town who takes, perhaps, more than a business interest in his work. The work done by travelling photographers for large firms is often very poor. Printed from reproduced negatives made thin for the purpose of quick printing, without regard to quality, they are black and without atmosphere, and not worth even the small sum for which they are nearly given away.

The societies are getting along at the usual jog-trot pace, reiterating the usual topics. In a method, in the scientific part of which there is so little to teach, this is the most useful thing they can do. But some, and perhaps most, of the suppliers of papers, rather than not keep on supplying papers, write on subjects

that are only very remotely connected with our art, or, worse still, that they know nothing about. Can it be that such delightful subjects as developers, emulsion-making, ceramic enamels, and isochromatics are played out, and process work only left, that a representative man of the chemical-mixing persuasion must write a paper on art for the purpose of saying (*not*, he is careful to say, on behalf of the Society of which he is Assistant Secretary, though it had much that appearance) to art, "You're another, and ought never to have been written about at all?" Now, the art side has no jealousy of this sort of the scientific side, and rejoices to see the severely scientific nature of the papers now being read at the Royal. How Mr. Child Bayley could have deserted the delights of emulsion-making, for which he is admirably fitted, if a little late, for the thorny paths of art, a subject in which he has shown himself inexperienced, surprises me. It is as if I, the most unmathematical person in the world, insisted on reading a paper on "fluxions," and demanding its publication in the *Philosophical Transactions*. Not that I think emulsion-making wanted reiterating, for it is better done for us by the manufacturers than Mr. Child Bayley can tell us how to do it. But *we*—the art side—never object to his writing about it as often as he likes. I must say this, any how, even if the sky falls, that the Council of the Royal could not have spent the money of the Society half so well as in sending its Assistant Secretary to the late Convention to learn a little art before he took to writing on the subject. But the Royal always misses its opportunities. He would have seen a little exhibition there consisting entirely of pictorial photographs, from which he would have learnt what such photographs should be, and —what would have been of, perhaps, more use to him—how to hang them. This he would have learnt from a local society too, for the Leeds Committee were entirely responsible for the splendid hanging. By application to the Committee, he might also have secured police protection to prevent any one teaching him anything. He might have learned from the pictures alone, for he is of the second-hand opinion that art cannot be taught; that all art can be better learned by merely looking at good photographs—how does he know when he comes to a good one?—than by reading about art. I am only an artist, but I cannot see how anything can be learned by merely looking at good pictures without the aid of some written or spoken description of *why* they are good, or some preliminary knowledge of the same kind got from talk or books. This kind of tasting only tickles the palate, it doesn't feed. I should as soon expect a scientific tyro to give me a quantitive and qualitative analysis of a bottle of physic by simply holding it up to the light. H. P. Robinson.

COLLODIO-BROMIDE AND TRANSPARENCIES FOR PHOTOGRAVURE.

[Royal Photographic Society.]

In order to produce a photogravure plate it is first of all necessary to have a transparency made from your negative, and it is only by taking the greatest care that this shall be perfect for its purpose that a perfect plate can be secured.

It is necessary that this transparency should have every tone of the subject clearly defined, and with as wide a range of gradation as possible. It must start in the highest lights, with all but bare glass in every case, but the density of the deepest shadows must be in accordance, not so much with the subject as the nature of the grain to be used on the copper plate.

Roughly you may put it in this way:—

1. Very delicate subjects with fine detail require a very fine even dust grain on the copper plate, and a very delicate transparency; all the detail must be there, but the deepest shadows must be decidedly thin.

2. All ordinary subjects, including negatives from nature, such as would print well on silver paper.

3. Reproductions of paintings with heavy masses of shadow, and very large plates, such as require a coarse grain in order to avoid muddiness.

For large masses of shadow and heavy subjects, it is necessary to get very much wider range of tone in the transparency, because one must use a larger dust grain on the plate, and, in order to get the requisite pluck, the etching solutions must act longer on each tone, *i.e.*, the total time of etching must be very much longer. Instead of an even-sized grain for such subjects, I prefer to use a mixed bitumen and resin grain. First lay a coarse bitumen grain, rather wide apart on the plate, and affix by heat in the usual way, then lay a copious very fine resin grain over the bitumen, and heat only sufficient to firmly affix it to the plate. With such a grain the fine particles of resin will soon be undercut in the deepest shadows by the etching solution, leaving the bitumen to form the ink-holding capacity of the plate, but the resin will secure delicate half-tones in the lighter parts of the picture, and the few dots of white in between caused by the bitumen will add to their brilliancy.

I have here, and will pass round, two transparencies. One is a carbon print, such as would yield a good photogravure; it is from a negative from nature, that negative being of such density that it will give all the gradations and density required, by simply printing in autotype tissue. Where your negative is of this type and the required size, I think this process may always be relied upon to secure the finest results.

The second is a much more delicate subject, being a reproduction of a silver point drawing. Such a subject requires a very fine grain, preferably white resin, and, as that grain is very easily undercut by the etching solutions, it is necessary to get all the gradation in a very much closer scale.

Perhaps the easiest method of securing a transparency of any desired kind is to use collodion emulsion. Gelatine dry plates I know will do very well for many subjects, but I have always found collodion more certain and less difficult.

For the emulsion I prefer as simple a formula as possible, and, after experimenting with many, I settled on an unwashed bromide emulsion as the most suitable. The emulsion is made in bulk, using an excess of bromide, so that in the unwashed state it is very insensitive; by using it in this form, and afterwards washing out the excess of bromide, you may coat the plate in a good light, when all defects may be at once noted, dust, specks, &c., and then take the plate into a safer light, whilst washing out the excess of bromide.

With such a plate any class of transparency required may be obtained with ease, by varying the exposure and length of development, a strong, plucky picture from a very thin negative, or *vice versâ*. I find it best with line subjects to get only a very faint image with the development and secure the requisite density by after-intensification.

To prepare 10 ozs. of the emulsion, dissolve 250 grains of silver nitrate in a test tube, with 2½ drachms of water, and add 2½ ozs. of warm alcohol (·805), weigh out 50 grains of pyroxyline, and place in a 12 oz. amber glass bottle, add the silver solution and 5 ozs. of ether (·725) to dissolve the cotton.

In 2½ ozs. of alcohol dissolve 200 grains of zinc bromide, take the solutions into the dark room, and gradually add the bromide to the collodion, shaking well between each addition.

For development I have always used the formula for pyro and ammonia given by Mr. Brooks:—

No. 1.

Saturated solution of carbonate ammonia ..	4 ozs.
Potassium bromide	4 drachms.
Water to	20 ozs.

No. 2.

Pyrogallic acid	6 drachms.
Alcohol	4 ozs.

For a half-plate take ½ oz. of No. 1 and 6 to 12 minims of No. 2, according to the class of transparency required.

Either hypo or cyanide may be used for fixing, but, if the negative is to be intensified, I prefer cyanide, as the film can be washed in a shorter time; I never use a substratum, but only an edging of rubber solution; dishes are not necessary, and any size plate may be coated with ease without the uncertainty of using a different batch of emulsion, as you would probably have to do with gelatine plates. A heavily weighted stone jar, with a pad fixed in the mouth, should stand in the sink to support the plate during development, &c.

It is always advisable to secure the necessary density of half-tone subjects by development or acid pyro intensification, but for line work I prefer to get a very faint, clear image with the developer, and intensify with lead; after fixing, wash well, and flow over with

Nitrate of lead	2 ozs.
Red prussiate potash	2 ,,
Water to	20 ,,

Wash well under the tap, and flow over with water 10 ozs., nitric acid ½ drachm, wash, and flow with sulphide of ammonium, wash, and again apply the acid. The very finest line work may be copied in this manner without fear of the lines filling.

For keeping the emulsion, I use a 10 oz. ordinary wet-collodion pourer with cap, kept in a tin with loose-fitting cover, so that it may be easily taken off with one hand in the dark room. For copying from line subjects on yellow or toned papers, add a few drops of an alcoholic solution of erythrosine to the collodion, and use a faint yellow screen.

Extreme contrast, such as required for line work, can be much more easily obtained with an unwashed than with a washed emulsion.

For line work in photogravure I prefer to have a very small amount of dust grain on the plate, and, if the drawing contains brush work or large black patches, to let these go in the etching, and recover their values afterwards by re-etching. If you attempt to use a sufficiently large dust grain to give brilliant deep blacks, the finest lines would etch broken or rotten.

I will pass round an example. There are in this drawing a great number of very fine lines, together with solid patches of black; these fine lines, if etched over a coarse enough grain to suit the black patches, would have been broken up into dots, but, by keeping the grain fine, the fine lines are all sweet and clean, and the solid blacks, which were undercut in the etching, have been recovered by after-biting.

I would like to mention a wrinkle in connexion with line negatives. One sometimes wishes to copy a print on coloured paper, and I have found it more easy to bleach out the colour than to attempt to make a good line negative by the use of orthochromatic plates and a yellow screen.

I may say, the only difficulty likely to be met with in making the collodion emulsion is with the pyroxyline; this should dissolve without leaving any glutinous particles. The best way is to try several brands, and, when you get a suitable one, buy a quantity, a little sand of insoluble matter in the emulsion will not matter, but always shun a cotton which gives a flossy collodion.

E. Sanger Shepherd.

CELLULOSE AND ITS DERIVATIVES.*

We do not propose on this occasion to do more than demonstrate the main properties of the solution, and of the new forms of structureless cellulose to which it gives rise.

We pass on to the third group of soluble and plastic compounds of cellulose, those formed by the reaction of the OH groups of cellulose with negative or acid and radicals; these are the acid ethers or esters.

Of the possible esters of cellulose, the following have been investigated: the nitrates, acetates, benzoates, and sulphates.

Whereas, however, the first-named take a prominent place in the industrial world, the three latter are known only to specialists. We need only briefly remind our audience of the chief uses of the nitrates of cellulose. They are two, and in strong contrast to one another. The higher nitrates of cellulose are the basis of the modern high explosives, the so-called smokeless powders and the like; the lower are employed as the basis of the many forms of transparent and opaque films employed in photography, of celluloid, xylonite, and other plastic materials of this group, also of the well-known collodion which played so important a part in the early days of photography, and still more recently as the basis of the new "artificial silk" industry. Avoiding the details of their applications, we may say a few words on the more important chemical feature of these products.

Cellulose combines with nitric acid in several proportions. Writing the compound as $C_6H_7O_2 . (OH)_3$, each of the OH groups may be made to react with HNO_3 or nitric acid, each OH becoming in succession $O . NO_2$, with a corresponding increase of weight of the resulting nitrate. What we wish to point out is, that with the entrance of these highly negative or acid groups the physical properties of the parent molecule are not profoundly modified. The products are soluble in various liquids, *e.g.*, ether-alcohol, nitro-benzine, nitro-glycerine, which are without action on cellulose, but the properties of the compounds in solution are very much those of cellulose itself as seen in the solutions previously described. This could not be better illustrated than in the processes of spinning and preparing the "artificial silk." What is actually spun or drawn is a viscous collodion, the ether-alcohol solution of the intermediate nitrate. The resulting thread after elimination of the solvent is therefore the explosive compound or nitrate. But the nitric groups are easily removed by a chemical treatment. The yarn is treated with ammonium sulphide for this purpose, and there finally results a thread of pure cellulose, with very slight attendant change of physical properties. (See *J. Soc. Chem. Ind.*, June, 1896.) The cellulose is therefore taken through a cycle of chemical treatments without sensible change in properties, in order to take advantage (while in the intermediate stage of nitrate and in this form soluble in suitable solvents) of the plastic and structural properties which are evidently those of the parent molecule.

* Concluded from page 488.

The acetates stand next to the nitrates in order of technical interest. They are not easily prepared from the fibrous celluloses, but are obtained by simple reactions from the cellulose regenerated from solutions as sulpho-carbonates. These reactions are described in a paper which we communicated to the Chemical Society in 1895. (See *Journal*, p. 433.) The acetates are in physical properties similar to the nitrates. They are, however, non-explosive and withstand high temperatures, melting above 200° C. to a clear liquid. They are in fact, as might be expected, extremely stable compounds, and in many respects, therefore, they are superior to the nitrates for industrial uses. We are taking steps to have them manufactured on the industrial scale, and hope very soon to be able to offer them to photographers.

It would be interesting, if only on theoretical grounds, to make comparative trials of the well-known, but now relatively obsolete, collodion processes, with the acetates used in place of the nitrates. If any expert minded to undertake such investigations will communicate with us, we shall be able to put him in the way of obtaining supplies of the material. We shall not discuss the probable uses of these new products in detail, but content ourselves with a demonstration of their properties, and leave the matter in the hands of the specialists.

The benzoates again are compounds easily prepared from the more reactive celluloses obtained from the sulpho-carbonate solutions. They have been even less investigated than the acetates. They have the same general properties, and will, no doubt, in due course find their application.

These compounds will be found more fully described in our book on *Cellulose* (Longmans, 1895). On this occasion we have merely to bring them together in a certain connexion, *i.e.*, with the view of making photographers acquainted with the possibly useful forms of cellulose and its compounds. The annexed table sums up the results of this discussion, and gives a bird's-eye view of these various products regarded, from the present practical point of view, as methods of bringing cellulose into solution.

Soluble Compounds of Cellulose.

A. By direct treatment with solvents: the cellulose in solution as a species of double salt: the solutions are aqueous.

1. Neutral. Zinc chloride.
2. Acid. Zinc chloride in hydrochloric acid.
3. Basic. Cuprammonium compounds.

B. Compounds previously prepared by synthetical reactions with alcoholic OH groups.

1. Sodium hydrate and carbon bisulphide. Synthesis of sulpho-carbonate in two stages. Solutions aqueous, and of course alkaline.
2. Acid esters of cellulose: compounds of "neutral" properties.

	Nitrates.	Acetates.	Benzoates.
Soluble in:	ether, alcohol, acetone, chloroform, glacial acetic acid, &c.		

We now return for a few moments, in conclusion, to general considerations.

Cellulose, as the colloid medium for the photo-sensitive substance, has of late years given place largely to its rival gelatine. Gelatine is a substance differing radically in composition and constitution from cellulose, having, however, a fairly close resemblance to cellulose in physical properties, more especially in aqueous solution.

If we are to have positive knowledge of the actual function of the "medium" in the photographic system, it must be made the subject of definite scientific investigation. An important aid to investigation is the power to vary at will the several factors of a result. In cellulose, which includes, we may say, a number of natural products of different constitution, and in the groups of derivatives which may be formed from it, we have a substance which may be studied under a range of suitable variations. The purpose of this demonstration has been to suggest methods of manipulating various forms of the substance, the details of which will readily occur to those familiar with the technicalities of the art. Those who have not followed us from this point of view will, we hope, at least have got some fresh insight into a very attractive province of the chemistry of nature's raw materials.

Cross, Bevan and Beadle.

PHOTOGRAPHIC WORKERS AT WORK.

X.—The Autotype Company at Ealing Dean.

The Autotype Company, whose reproductions of the works, both of old masters and of modern artists, are to be met with far and wide, is one of the few photographic firms which enjoy a reputation both inside and without photographic circles. To the outsider they appeal by the reproductions just referred to, by the illustrations of coins, medals, &c., in the British and other museums, and as proprietors of handsome showrooms in New Oxford-street. To the photographer, on the other hand, they are known as manufacturers of carbon tissue and implements for carbon printing, as enlargers and printers by that process, and, more recently, as makers of platinum paper.

The history of the firm, whose prosperity seems now assured, has been a chequered one, and it is not the least curious circumstance in connexion with its career that, while formed originally to work the Swan patent for pigment printing, its business in this respect has enormously increased, even since the expiration of the main patent. The works were started in 1868, at Willesden, in premises adjoining the house of Mr. Ernest Edwards, who was interested in the Company at that time; three months later they were shifted to Brixton, and, after fifteen months there, a remove was made to the present site at Ealing Dean, where they have grown steadily and continuously to their present size. We might mention here that we had the pleasure of Mr. H. J. Burton's guidance, a gentleman who has been with the firm since its commencement, and who is now works technical manager. The Gallery, where the productions of the Company are on sale, in like manner started at No. 5, Haymarket. Messrs. Tooth's; removed thence to Rathbone-place, where a disastrous fire occurred; and was transferred finally to the present site, at No. 74, New Oxford-street.

At a little distance from Castle Hill Station, on the Great Western Railway, the Works of the Company are to be found, and entering them, we are first conducted to see the manufacture of carbon tissue and of transfer paper. The gelatine, which enters the works in the form of thin sheets, is first soaked in water and melted up, and is then transferred to metal churns in which it is kept in continual agitation for some hours—a process designed to get rid of a certain lumpiness which it otherwise would possess—after which churning it is run out and allowed to solidify in large masses of jelly.

In the mean while the pigment, which is received from its manufacturers ground to a very fine state of subdivision, is being once more ground up in a paint mill with a small portion of the gelatine, the bulk of the latter only being added when these have been thoroughly incorporated. The jellies so made are mixed in the necessary proportions to secure the result aimed at, and after the colour has been finally tested on slips of opal glass, a pile of which were to be seen here, it is transferred to the coating rooms. Of these rooms there are two, and a description of one of them must serve for both, since they are very much alike, the chief difference being that sensitive tissues, *i.e.* those containing the bichromate, are made in one of the rooms only, and not in either indiscriminately, although both are fitted for their production, if necessary.

The coating machine is a gallowe-like erection, carrying a roller at its upper extremity. The paper in large rolls is fitted in a frame, which carries four rolls, and the end of the first length is led round rollers till it passes round under one at about three feet from the floor. This roller runs in a trough of pigmented or plain gelatine (pigmented for the tissue, plain for transfer papers), which is fed upwards by a form of cam known as a snail, so that at the lowest part of its course the paper is just below the surface of the liquid gelatine. It picks up a coating of this as it travels on, and is led straight up, over the roller at the top of the machine and down an inclined plane on the other side on to a long table. This table carries a broad web of canvas down its entire length, on the endless-belt principle although the web itself is not strictly speaking endless, and the web, always travelling on away from the coating machine, carries on its surface the coated paper. As soon as the paper reaches this table it is taken in hand by a girl, who slips a bar of wood underneath the band and cuts off a length of about twelve feet six inches, and attaches to the two ends of this length strips of wood by means of clips. When this paper has travelled down the table, the two ends of the bar engage in a carrier, and another girl, pulling a cord, raises the band in the form of a loop hanging over it to the top of a scaffold, from whence a third girl, with a long carrier, like a magnified broom, picks off the bar by its two ends and conveys it and the band of tissue hanging over it to wooden pegs on which it is hung to dry. This takes place by the next day, sometimes sooner, since each room is heated by steam pipes and is provided with a fan for ventilating purposes. The motive power for one of the coating rooms is in the form of a two-and-a-half horse Gardner gas engine, which does its work quietly and effectively. The rest of the power required throughout the works is furnished by a pair of steam engines, the boilers for which also supply hot water for printing purposes and the steam for heating, the condensed steam providing a constant and ample allowance of distilled water.

The length of time taken by the tissue and transfer papers in drying matters little within reasonable limits, except in the case of the sensitive tissue. Then, on the other hand, it becomes very important, and has to be dried within a certain time to be satisfactory. Sensitive tissues are coated on Monday and Thursday, so that orders received on Tuesdays and Fridays for this product are filled by that made the day before. The coating rooms are each capable of containing and drying upwards of a hundred lengths of tissue. The water supply is situated in a tower attached to the tissue-making department, and is contained in four large tanks for the regular supply of cold water, one still bigger as a reserve, and one containing hot water.

The next department to be visited by us was that in which negative-making was being carried on, here pictures are copied and enlarged negatives made for the subsequent operations of carbon printing, photogravure, collotype, &c. Outside the studio where much of this work is done, stands a colossal easel, for carrying very large pictures for copying purposes. This Goliath is over ten feet high and travels along two G.W.R. rails firmly bedded in concrete. To secure rigidity, the whole structure is of the most substantial nature. Cameras, in the ordinary sense of the word, are not usually employed, the room in which the operator works acting as the camera, and it is rarely the case that a negative is made direct, a reversing mirror being used with the camera at right angles to the picture; the smaller negatives made in the studio are made, however, in a camera.

The wet-collodion process is extensively employed for enlarging and copying, orthochromatic dry plates being used when rendered necessary by the subject being in colours. The collodion used is made by the Company with pyroxyline, which is also of their manufacture, and many of the dry plates employed are of their make also. A dark room for coating wet plates contains nothing very novel as a rule, but the Autotype Company's was rendered interesting by the fact that they frequently deal with wet plates sixty-five inches in length by thirty-six in breadth! To manipulate these huge plates, a frame is used having a handle at one corner and supported in its centre by a universal joint. Three operators are required; one pours the collodion on the plate; another, holding the frame by the handle, inclines the plate until it is covered, and then pours it off into a funnel held by the third. The plate is next transferred to a bath of correspondingly large proportions swinging on pivots. This bath is of the well pattern, and, being fixed vertically, receives twelve gallons of silver solution into its well, after which the plate is placed in it erect, supported just above the well on ebonite pegs, and a lid encloses plate and solution in a light-tight and dust-tight box. The bath is then swung down into a horizontal position, when the liquid flows over the plate, and in this position it is allowed to remain for about a quarter of an hour, when it is once more brought to the vertical again, and left in the bath for some time to drain. Exposure is made in one of the rooms devoted to the operation, development being carried on in a special dark room, and intensification in another. A quart of developer is found to be sufficient if properly applied, and the very large plates are fixed and washed in the sink in which they were developed, the washing being carried out by a rose and length of rubber tubing. "As we can't take the plate to the water," says Mr. Burton, "we bring the water to the plate." A large dipping bath is used for fixing smaller plates in, "smaller plates" at Ealing referring to such sizes as 36×28 and under.

The silver baths, where so much wet-plate work is carried on, need particular attention, and we found them occupying several carboys. Cotton-wool, rinsed first with alcohol, then with tap water, and finally with distilled water, is employed for filtering, and some idea of the amount of wet-plate work done can be got from the fact that, as we were informed, no less than a hundred ounces of nitrate are used per month in this one department. The negatives are varnished in a room devoted to the purpose, being heated in gas-heated ovens for the purpose. In the varnishing room too we found a large gas-holder containing oxygen for the limelight. Daylight is much preferred at Ealing for enlarging purposes, but occasionally in winter time it cannot be got, and recourse is had to the limelight. For this purpose we were shown a twenty-two inch condenser, each lens of which weighs three quarters of a hundredweight, an instrument capable of lighting a 12×10 plate easily. Triplets, Grubbs, and Darlots are the lenses employed for enlarging and copying, of which the triplets seem to be the favourites; and numerous lenses are in constant use, as well as many mirrors.

Carbon printing was the department to which we next turned our attention. This is carried on in a large building divided into four or five rooms, each of which resembles the rest. Each room contains three or four large tables travelling on rails by means of flanged wheels. When these tables are drawn right into the room, they are in a subdued light, which is kept by means of yellow fabric of a safe character for filling and emptying the frames. The tables, when loaded with frames, are pushed along the rails until they are just outside the rooms, they are then under glass for printing in rainy weather. In fine weather they can be pushed still further out until right out of doors. Johnson's and Burton's actinometers are those most frequently employed, the printing frames having plate-glass fronts and, being employed for carbon work only, backs which are not hinged. The large negatives already referred to are printed in a frame capable of carrying a negative 68 × 43 inches, faced up with plate glass half an inch thick. This frame is mounted on a truck of its own, and swings on pivots for convenience in getting to its back. The tissue in actual use in the printing rooms is kept in a series of bins, and is cut up by means of a very blunt knife on a sheet of thick zinc.

When printed, the tissue is taken to the developing room, which is one of the largest in the works. Along the sides and ends of this room are large sinks, eighteen in number, some of which are over six feet long by three or four wide. Here the prints are mounted, developed, alumed, washed, and dried in a manner familiar to most of our readers. For convenience in developing the prints in the large sinks boards are sometimes used, which float on the surface of the water and carry the print, the water is then taken up in a sponge and squeezed over the print to develop it. For double transfer Sawyer's flexible support is employed usually, but we saw some double transfer prints having a very pleasant matt surface, due to the employment, as a temporary support, of a sheet of matt opal glass coated first with wax.

From the carbon-printing department we go into the "House," a private house, once the residence of Mr. Sawyer, but now absorbed into, and fully occupied by, the works. In one part we find photogravure being carried on, Messrs. A. E. Smith & Handford, winners in the recent photogravure competition at the Society of Arts, being busily engaged here. Carbon transparencies are, of course, employed, and, to relieve the main works, a building is now being fitted up for the purpose of transparency-making only. In this building, as well as the photogravure department, we find the manufacture of dry plates being carried on, as well as of platinum paper. This is the most recent enterprise of the Autotype Company, and is progressing healthily. We saw a number of specimens on papers of various degrees of roughness, from some thick Rives, with a beautiful ivory-like surface, down to a very coarse Creswick, both in black and in sepia tints. Space forbids us from giving to these departments the attention they deserve. For the same reason we cannot do more than refer to the collotype department, a very old-established portion of the works, collotype having been done here since 1870. There is much also to interest the spectator in the many minor operations which are carried on in the Ealing works. The enamelling of paper, the manufacture of pyroxyline, the rolling of prints and papers for collotype, and many other matters attract attention in walking through the works, but can only be alluded to here.

In conclusion, we would remark that the works are compact and well built. Their numerous departments are, doubtless, arranged with a view to business convenience and the due sequence of operations, but at a cursory view are quite bewildering in their number and connexions with one another, and everything shows signs of a large business being done, and that of a good class. The situation for this purpose is an excellent one, plenty of light and of fresh air, and a good supply of water being available. The Autotype Company has taken its place as one of the great enterprises of photography.

ASTRONOMICAL PHOTOGRAPHY.

In this week's Journal you ask any of your readers who know, to give a queriat information as to the above. As an amateur, I have done a little that way. The size of an image of the moon in any telescope is, according to M. Flammarion, one hundredth part of its focal length. In a telescope of forty-eight inches' focus, such as your inquirer possesses, the image of the moon at the principal focus would be barely five-tenths of an inch. As a sixpence is three-fourths of an inch in diameter, you can easily see how small the image would be. As regards the amount of light, a telescope of forty-eight inches' focus and four inches diameter would give a practically instantaneous picture of the moon. My own instrument is an eight-and-a-half-inch silver-on-glass reflector of seventy-seven inches focus, with the flat silvered, but with the large mirror unsilvered, that is, only plain glass, I get an instantaneous picture of the moon nearly eight-tenths of an inch in diameter. I have enlarged some of these up to one and a half inches, and they show a good many of the leading features of the moon very well.

Dr. Steinheil, of Munich, has shown that plain glass only reflects five per cent. of the light falling upon it, while a recent experimenter has made it only three per cent. The proportion betwixt a four-inch and an eight-and-a-half-inch is as sixteen to sixty-eight; but, to get the effective intensity of light affecting the plate in the two cases mentioned, we must divide sixty-eight by twenty, thus reducing the effective aperture of my reflector numbers to a glass equivalent to one 3·4 inches in diameter. I used no shutter. I just placed my cap between the flat and the eyepiece mount and took it away, and replaced it again as rapidly as I could. Of course, your inquirer may get much larger pictures of the moon if he uses a properly corrected negative lens in front of the sensitive plate. In my own case, I have a Zeiss negative lens of three inches' negative focus, such as Zeiss make for tele-photography; but, owing to the moon being unsuitably placed during the summer as regards my window, I have been unable as yet to use it. With such a negative lens I shall be able to get the image of the moon at least one and a half inches in diameter. Of course, the size of the image depends upon the length of the camera used.

There is another point: your inquirer would require his instrument, being a refractor, first of all, to find its actinic focus. This he can do by placing a plate in the attached camera, keeping the telescope fixed, and allowing a star to make a trail across the plate. He should do this with different lengths of his draw tube. On development, the plate will at once show which is sharpest. The plates I used were not rapid ones, but ordinary.

Wega.

"PHOTOGRAPHY IN NATURAL COLOURS" (?)—A CHALLENGE.

Last week we had a reference to the alleged discovery by Mr. Bennetto, of Newquay, of a method of taking photographs in the colours of nature. We have received a copy of the *Newquay Visitors' Notes* of July 31, containing the following communication from Mr. G. G. Bullmore, of Newquay:—

A friend of mine has read your article, "A grand discovery by a Newquay photographer" in your last week's issue, in which you state: "After seven years of patient investigation, our townsman, Mr. Wallace Bennetto, has attained what at one time appeared to be an unrealisable dream, viz., photography in colours of nature by *purely* photographic means." This friend is like Thomas of old—faithless and unbelieving," but also, like the said Thomas, is open to conviction. *He has, therefore, placed in my hands the sum of twenty guineas*, which he offers, through me, to devote to the furnishing of a ward in the new Isolation Hospital, if you will produce, within the space of one month, such photographs as you describe, viz., "Of the cliffs against the electric blue of the sea, varied by sea pinks in full bloom; or a sunrise and sunset," on the conditions that, should you fail to do, so you will pay the sum of 20*l.* to a similar object, and present a bound volume of the *Newquay Visitors' Notes and Directory*, containing a copy of last week's issue, to the British Museum.

You have stated that "several leading scientists and distinguished persons have seen the results and have declared them marvellous." It may shorten the issue if you will give their names, but, if I should not be satisfied that they are qualified to give an expert opinion, I am willing to abide by the decision of the Editor of The British Journal of Photography.

Personally, I am anxious that some public institution may be thus benefited, and I presume, on again reading your article, there should be no difficulty in accepting the offer through your columns in the current issue. Of course, before the matter is proceeded with, the two amounts must be deposited with some disinterested person to be mutually agreed upon.

Our contemporary states that an announcement concerning Mr. Bullmore's offer will probably appear in its next issue (August 7).

IMPRESSIONISM AND REALISM: THEIR SCOPE AND LIMITS IN PHOTOGRAPHY.*

Realism.

Having endeavoured to give a clear idea of what is meant by impressionism, I will proceed to define realism. This will not be so difficult, because the term is narrower in its scope, and by its nature more readily admits of exact definition.

Dr. Emerson defines realism as "the sharp photograph—wherein sentiment, illusion, and decoration are disregarded; merely a register of bald facts mathematically true." In another place he adds: "For example, the realist, if painting a tree a hundred yards off, would not strive to render the tree as it looks to him from where he is sitting, but he would probably gather leaves of the tree and place them before him, and paint them as they looked within twelve inches of his eyes, and, as

* Concluded from page 460.

the modern pre-Raphaelites did, he might even imitate the local colour of things themselves." Another definition, by the Rev. F. C. Lambert, runs: "The Realists aim at a faithful presentation of nature as opposed to expression of abstract ideas. Perhaps the Dutch School carried this method out most thoroughly, and painted a cat or a fiddle," as Reynolds said, "so that you could take it up." This slavish imitation of the Dutch painters was their chief trait. They copied objects exactly as they appeared in every respect. There is a curious example of this in a portrait of a gentleman in the National Gallery. We see a middle-aged gentleman without his hat, the lower part of his face ruddy from exposure to the air and sun; his forehead, having been shaded by his hat, is white, with the exception of one red band caused by the pressure of his head gear against the skin. To depict such a mark is the essence of realism, the realism of accidents. As F. C. Robinson remarks, "There is the Mr. Bounderby of photography, who must have facts, and nothing but facts." Near to this portrait of a gentleman hangs a landscape with figures, which carries out the "facts and nothing but facts" ideal; in this picture every leaf in a tree is accurately reproduced, and we marvel at the patience and industry of the artist who could paint objects with this microscopic care. This is the realism of essentials. Ruskin also classes the pre-Raphaelites with the realists. He says their aim was "to paint things as they probably did look and happen, and not as, by rules of art developed under Raphael, they might be supposed gracefully, deliciously, or sublimely to have happened." To sum up, realism may be pithily described as "fidelity to nature or to real life; representation without idealisation, and making no appeal to the imagination, adherence to the actual fact."

From a study of these attempts to fix the meaning of the ideas we attach to the terms "realism" and "Impressionism," it will be readily seen each stands for a distinct phase of art; and, furthermore, that they are contradictory. Each is possible only by the suppression of the other. Impressionism gains its effects by the neglect of form, colour, light and shade, striving to give the motion or vitality of the subject; realism depends solely on form, colour, and, in a less degree, on light and shade, leaving aside all attempts to impress the spectator with the idea of motion. It is at once perceived to be ridiculous to show every hair on a running dog, every feather on a flying bird, or every fibre of a flower bending with the wind, and such motion cannot be depicted on canvas, but only suggested to the imagination by an impression. This opposition between realism and impressionism will be still more marked in discussing their scope and limits in photography.

Impressionism: Scope.

The scope of impressionism in photography is very contracted, mainly due to the chief purpose it seeks to carry out, that of representing motion—a thing less possible in the photograph than the painting. The photographic impressionist, to practise his method, must suggest motion by want of sharpness or "fuzziness," as the painter does by indefiniteness of outline, weakness of form, and obscured detail; but, in the photograph, the limit of such a process is quickly reached in the destruction of the structure of the image which takes place. The painter, however, can go much beyond the photographer, and retain his form amidst a very indefinite outline. Thus, compelled by this necessity, we see that the most prominent feature in the work of photographic impressionists is the disregard of sharpness, and, as in the paintings, every phase is subjected to the general effect, the result being that it throws out the immaterial or imaginative qualities of the work at the expense of the material and actual. The soul, or want of soul, is laid bare. A photographer can thus, to a certain extent, take advantage of impressionist treatment to animate his works with the quality of life and movement.

Another power which impressionism gives to the photographer is that of suppressing some portions of his pictures and giving prominence to a few beautiful and striking features. In this connexion I will quote Edward Dunmore, who has pointed this out very clearly. He says: "*Sometimes* a fuzzy, out-of-focus picture possesses very many art qualities, and has very great charms for a true artist, whether he is a photographer or not; but the charm does not lie in the fuzziness, but in certain leading beautiful lines, which are emphasised by all minor or less important ones being suppressed or indistinct." In technical language, this is the quality of broadness, that simple and wide treatment of light and shade, which is wanting in so many photographs. Spottiness of light and shade is a standing defect of camera pictures, and impressionism certainly supplies the remedy to cure this ill.

A third lesson we may learn from impressionism; and the most important, not only to photographers but to artists generally, is the doctrine of the relative values of tones. This should be carefully examined by all photographers, and the works of impressionists studied diligently. This doctrine is in no way necessarily confined to impressionism, but can be applied independently to any method of pictorial art. In general, partly inherent in defects in the chemical process, and partly through lack of knowledge, the photograph wants harmony of tone with nature. This failure to yield a pleasing and natural gradation of tone can be seen in many of the reproductions from the National Gallery paintings. They entirely failed to give the values of light and shade and atmosphere of the originals. Take, for example, Rembrandt's picture of himself; the original is a marvellous rendering of light and shade, and yet in the reproductions, although good copies photographically, it comes out harsh and crude. This may, of course, be due to the colour scheme of the original; but, whatever the cause, the reproduction cannot for one moment be compared with the painting. As a rule, photographs are too dark in the shadows, and too light in the half-tones; hence a gap in gradation occurs. This being a general fault, it would be far better to work within a narrower range of tones, instead of from black to white. In all sunlit photographs the shadows are too black, and altogether too intense as an impression received from nature; these shadows, being so deep, throw out of harmony the remainder of the subject. How can this be remedied? It will always remain a standing difficulty; for, if we expose for the shadows, in the mean time the lighter tones have lost their proper relative value; therefore with such a subject we may over, under, or correctly expose, each time obtaining a different tone value, and each time a false value to nature. An idea has occurred to me, in looking over some portraits of ladies' wearing veils, which might be utilised to lessen this heaviness. I notice in these prints that, where the veil covers the hair, there the shadows are much more harmonious. Now, it would be possible, by using a gauze curtain in a particular position, to break up the shadows throughout a photograph by a similar method, and yet show no grain. Such a process is daily used for obtaining a decided grain for photo-mechanical work, but I have never seen it suggested for the above purpose. It would be worth trying to lighten heavy shadows.

The foregoing three points indicate the leading merits of impressionism, and all are especially difficult to practice in photography.

Limits.

The limitations of impressionism in application to photography may be shortly stated as want of form, detail, reality, mind, and by its being tied to nature.

The great artistic defect of photography is its want of colour, hence it must gain its results either by form or light and shade. The impressionist takes away, or rather subordinates, form, colour, and light and shade to motion, so that the photographic impressionist, without colour, is left with form, light and shade, and motion in which to express himself. But form tends to vanish in motion; thus ultimately he is driven to the single power of light and shade in which to obtain his effects. And this, as I have shown above, is a false and often untruthful means of expression by photographic processes. Thus the photographic impressionist, without colour, deliberately sacrifices form, the next strong power of delineating objects; he therefore weakens his power of representing inanimate objects in which form predominates. A house to be truthfully depicted does not want the attribute of life which is the main end of the impressionist to create, though such a treatment will undoubtedly suit clouds, trees, or animals, which are in the same picture. The house, in losing its correctness of form and the clearness of detail, becomes shadowy, unsubstantial, and weak. This will be found to be the character of the houses in Walker's picture; they are not real houses, but ghosts. The loss of form and detail in things which are by nature solid and real, means a want of reality. Thus the impressionist, whilst gaining the reality of trees and flowers, loses the reality of solid things. This vagueness of solid objects creates a feeling of want of mind, for it is only by the exercise of reason and our mental powers that we can conceive of solids at all. Solids do not impress us at a glance, but rather by analysing the form and carefully noting the detail; it is a process of judgment combined with simple perception, and takes time; hence, to give an idea of solidness, the picture must also be built up bit by bit in the observer's mind, and not impressed in a flash. Lastly, this want of mind is mainly the outcome of the contracted sphere of nature in which the impressionist is content to work. Robinson noticed the narrowness of the impressionist's interpretation of the term "nature," it practically excludes man and his emotions. This deficiency of impressionism was noticed as early as the days of Velasquez; a writer of that period observes: "The naturalist is a mere reader, who cannot think beyond what he finds in the book (of nature)." On the other hand, the true artist is a thinker, a dialectician,

who argues, demonstrates, disproves and concludes with his pencil. When impressionism goes beyond its own conception of what constitutes nature, it is not to be compared with other pictorial methods; this I can better illustrate under the scope of realism.

Realism: Scope.

Realism is of much greater value to the photographer than impressionism, because it upholds the supremacy of form and definition. The photographer should never release his grip of form and detail, for they are the richest and most fruitful art sources under which he can work. Form combined with light and shade is the proper sphere of the photographer, and, if he work with the spirit of an artist, he will produce pictures having a just claim to be regarded as fine art. Under realism it is possible to express more of the attributes of nature than under any other artistic method. The impressionist can only gain his end by sacrificing some of the advantages of realism that he might use. In a realistic work we gain what we lose in an impressionistic, that is, form, detail, reality, and, as a consequence, an evidence of mind and a fuller, richer, and more interesting picture of nature. The scope of realistic photography is wider than any other manner, its limits are consequently fewer; in addition, it is not confined to palpitating nature, but can roam at will through every field of art. There is one sphere totally ignored by the impressionist, thus admitting that it is without the bounds of his art, yet which comes well within the range of realism, I refer to the picture with a story to tell; such a thing is almost impossible to the former, hence his disdain, but it is peculiarly adapted to the latter. Thus every picture with a story to tell is painted realistically. Take for instance, *Choosing the Wedding-gown* by Mulready. What could the impressionist make of such a subject? The very question reveals the limitations of impressionism; human emotions are beyond its sphere, they partake too much of the internal above the external. That is to say, in such a picture, the subjects must be drawn as "real persons in a solid world—not of personifications in a vaporescent one," and painted after the fashion of the realist, who works from the cause to the effect, and does not let the effect reveal, and perhaps hide, the cause. Subject pictures are very complex, the mind must first analyse them, and then put them together again before they become intelligible. Hence, in building them up, the mind experiences the emotions which the various parts of the painting express, and a direct appeal is made, not only to the eye, but also to the mind. Now, it is not possible to project ourselves in this manner into an impressionist work; their unity prevents it, and they give the mind no support. The *Harbour of Refuge* certainly arouses the emotions of the spectator, I have tried to ascertain from whence this arises, but am still in doubt. It is not the subject of the picture, but probably the association in the mind of the declining sun and the declining days of the aged; perhaps it is caused solely by the reproduction of sunset, in any case it is the eye, and not the mind, which is chiefly addressed.

Impressionism appeals mostly to the eye; realism, bringing in more thought, acts more upon the mind, and in so doing, establishes its superiority; realism is thus a richer art and can express more of the beautiful than impressionism. As Sir J. Reynolds remarks: "It is not the eye, it is the mind which the painter of genius desires to address. Realism, we may therefore conclude, is the larger art, it is more in agreement with photography, and better adapted to bring out the special qualities of the camera products; hence photographers should use it the more largely, remembering that its merits are form, detail, reality, mind, and a wider scope. Nevertheless, it must not be forgotten that impressionism can be successfully used upon such subjects as I have pointed out, and cannot be surpassed to give simplicity and broadness of effect.

Limits.

The faults of realism are that it tends towards woodenness, want of vitality, to vulgarity and the ugly, to place detail before form, and to disregard tone values.

It is obvious, that any method which gives minor detail equal prominence with the larger masses must be wrong, photography is very liable to this mistake. Reynolds pointed this error out in his lectures; he says: "Even in portraits, the grace, and," we may add, "the likeness, consists more in taking the general air than in observing the exact similitude of every feature." This precept he practised in his works. The Dutch, on the contrary, copied every line and every fault in their sitters; their portraits are the more truthful, but Sir Joshua's are the more beautiful.

This fidelity to detail helps to increase the stiffness so common in painters of the realistic school, they suffer from the defect of their virtues. Exact copying of nature leads to slavish imitation, to vulgarity, and to perpetuate blemishes. It also causes painters to place the methods of art before its aims. The cabbage is thus a favourite subject of realists, not because of its beauty, but because it offers an excellent means for the display of technical skill. In like manner, dark interiors are often the subjects of photographers, not for their beauty, but for the display of technical skill. Degeneration soon follows such realists, for they begin by copying the decayed leaves of a cabbage, and end by portraying some horrible object fresh from the hospital. So entirely engrossed by detail is the realist, that he is apt to lose sight of his picture as a whole; the subtlety of light and shade and relative values he thus misses, and still further increases the hardness of his pictures. All these faults can be urged against photography, and they should be avoided as far as possible; but it may be debated whether these defects are not compensated for by the supreme truth which their very presence implies.

Throughout these articles I have made no reference to idealism, because, firstly, it would only have helped to confuse a subject none too clear already; secondly, photographers have still many worlds to conquer in the realm of impressionism and realism; thirdly, it will be time for photographers to discuss idealism, when the men calling themselves artists because they can express idealism, and denying the same name to photographers because they cannot—when such men show this same idealism in their works which is now totally missing; fourthly, whilst the pictorial arts express idealism with the utmost difficulty, other arts express it with ease; and I hold it is best left with them.

Returning to the question with which we started—the influence of impressionism on artistic photography—I will draw the following conclusions:—

(1) That impressionism has aided photography by directing attention to its art possibilities, and by giving it a new method.

(2) It has proved that photography can and does express individuality, even to creating opposite schools.

(3) It has given a means to express the artistic quality of broadness, and pointed forcibly to the importance of tone values.

(4) Taken throughout, it has immensely strengthened the right of photography to the title of a fine art, and raised the artistic merits of its productions.

In conclusion, I would have liked to have supported these assertions by referring to actual works, easily accessible to all; but no such collection exists. That pleasure I must defer until the establishment of a National Gallery of Photographic Art.

John A Randall.

TABER'S METHOD OF PRODUCING EMBOSSED PHOTOGRAPHS.

The patentee, Mr. F. A. Taber, says:—

"Heretofore photographs have been produced on flat paper and rounded or bulged paper, the latter being an endeavour to project the image to give the idea of relief. On the flat paper the same idea has been carried out, in accenting the light and shadows on the image, and throwing an imaginary shadow on the background such as would be produced by a raised image.

"This invention is designed to produce the above-mentioned effect, and consists in forming a mould from a photographic impression from the same negative as used in producing the prints, and then in pressing them into the mould, where they are dried under pressure to the form of the mould.

"The first step in this process is in the taking of the negative, as is usual in photography. A block of wood is then provided with a sensitised surface to receive a photographic impression, which is developed as a plate or paper. In some cases I prefer to merely provide as a sensitised surface for the block a prepared sheet of sensitised paper. This block is then carved out to varying depths, according to the intensity of the lights and shadows on the photograph. In carving, the high lights and pronounced features are sunk the deepest, and from them the remaining carving is graduated. This mould is dressed off smooth to leave no rough surfaces to mar the photograph, and is then ready to receive the print. While I have here described the carving as being minute in details of features, this is not essential, for the reason that the smallest features are shown by the lights and shades of the photograph.

"To register the moulded impression and the print, I provide a form or frame which is the exact size of the print. Within this the print is laid, and must register exactly with the mould.

"The prints are now mounted on a cardboard backing, and when set they are moistened and placed over the mould in the frame face downwards. Sponge rubber is then spread over the back, and the whole placed in a press, which by means of the interposed rubber forces the print into the mould and compels it to take the shape of the mould. This shape being sunk in the mould to the varying depths, produces in the photograph a counter relief.

"The print is now maintained under pressure until dried, when it

will be found to be embossed to conform to the photograph, the features being pronounced in likeness to the individual.

"When so dried, the embossed print is mounted on suitable mounts. In some cases I find it desirable to fill the back of the embossed image with plaster or other material, for the purpose of maintaining it solid. Also I find I can pack them more easily by placing them on mounts with sunken panels, as the sides of the mounts prevent the mashing of the embossed prints."

The patentee's claims are:—

1. The method of producing a photographic image, which consists in transferring a photographic impression upon a block, sinking into the said block a mould for the features in conformity with the photographic impression, placing over the mould a photographic print, and pressing the same into the mould to emboss.

2. As a new article of manufacture, a photographic image, the features of which are embossed.

3. As a new article of manufacture, a photographic image, the features of which are embossed and are packed with a hard material to prevent mashing.

4. As a new article of manufacture, a photographic image, the features of which are embossed and backed with a hard material to prevent mashing, and provided with a mount, the sides of which extend to a level with and above the highest embossed parts.

[It is interesting to compare the above process with a very similar one that has been previously patented, and is described in the JOURNAL of July 24.—EDS.]

POCKNELL'S IMPROVEMENTS IN DARK SLIDES.

MR. EDWARD POCKNELL says:—

"According to one portion of my invention I employ an improved shutter in which the main portion of the shutter can be detached, leaving the bottom part permanently connected to the slide.

"For this purpose, a pull-off hinge or connexion is used, so that the shutter can be pulled to the top of the slide, and then at once detached. The shutter and bottom ledge slide in grooves in the usual manner, the bottom ledge being prevented from moving past the upper end of the slide. This ledge covers the top of the glass, and prevents any danger of light leaking through this part, and thus injuring the plate at the other side.

"The connexion I propose to employ between the shutter and the ledge consists of a small hook on the latter and a corresponding hook on the bottom of the shutter, so placed that the two can engage together when the shutter is in line with the ledge. The shutter and ledge are rebated, and the lower end of the shutter is formed with a recess in its inner face into which the hook on the ledge can extend to engage with the upper hook. Thus, on pulling the shutter to the top, it can be at once detached by a slight motion to one side.

"This arrangement is especially convenient in the case of hand cameras, as it allows the shutter to be completely removed instead of having it lying on top of the camera, or otherwise placed in an inconvenient position.

"Another portion of my invention consists of a simple indicating device fitted to the top of the slide. This indicator is made from a small metal bar or strip furnished with a head and sliding in a groove. The indicator can be moved to either end of the groove, and, according to its position, it will indicate whether the plate has or has not been used.

"To open the slide for insertion or removal of the plates, I employ a small door of metal or rather suitable material hinged to one of the lower corners of the slide and extending across the bottom, a groove being formed to receive it.

"The door is furnished with a small hinged plate serving as a catch, a pin being fitted to the side of the slide to retain the plate. The door is furnished with two narrow ribs or ledges which project into the ends of the compartments carrying the plates supporting the latter and holding them in position.

"To remove the plates, the door is opened, allowing them to fall into the hand."

FAY'S IMPROVEMENTS IN MOUNTING PHOTOGRAPHIC CAMERAS ON THEIR TRIPODS OR SUPPORTS.

MR. JOHN HENRY FAY, of 22, Eastbourne-road, South Tottenham, says that the object of his invention is to provide very simple and cheap, but highly efficient, means for mounting photographic cameras on their tripods or other supporting appliances in such wise that these cameras can very easily and quickly be moved into any position, and be pointed in any direction and be trained on objects or views wheresoever such objects or views may be.

"To carry out this object I place on the top or platform of the tripod or other supporting appliance a table of the desired size and shape, and centrally or thereabouts pivoted thereon in such wise as to be capable of being turned on this top or platform, and of being clamped theron in any position.

"Two parallel plates are made of any desired sizes and shapes, and maintained in any convenient manner a certain small distance apart, and these plates can together be mounted on edge transversely across the table, it may be by a web common to both hinged or pivoted on such table or otherwise in such manner that they can together be erected on this table, and also turned down on both sides until they are parallel with the same or thereabouts. To support these plates in their desired positions a semicircular slotted guide can be erected on the table across one of their ends through which slot can pass a stud or bolt secured on or to this end of the plates, and a screw nut on such stud can clamp the same in position in the slot.

"A lug, or bracket, or the like, is formed on or attached to the camera in any desired position, and may be of any suitable size being capable of being inserted between the two plates, and, when properly placed between the same, a bolt can be passed through the parts to act as a pivot, whereon this lug, or the like, and therefore also the camera, can be turned, and a screw nut on this bolt can clamp these parts in any desired relative positions.

"It is therefore obvious that the camera can be easily and quickly moved on the pivot in the plates, the plates on their hinges or pivots on the table, and the table on its pivot on the top of the tripod or appliance into what relative positions are required, and therein can be securely clamped, and then as easily and quickly be moved into other positions, and so on.

"Instead of hinging or pivoting the plates by or through their lower horizontal edges on the table as aforesaid, they can be pivoted by the lower parts of their lateral edges, or by prolongations of the same in brackets or the like erected in the proper positions on the table, or, when desired, only one of such lateral edges can be so fitted, whereby the same effects would be produced.

"Again, instead of the semicircular slotted guide aforesaid, a large flat and broad standard can be erected on the table in the same position, and the plates aforesaid can be formed on or secured to a disc or the like by or through one of their lateral edges, and this disc or the like can be centrally or thereabouts pivoted on the face of the large standard on which pivot a screw nut can be fitted to clamp this disc or the like in any desired relative position whereby also the same effects would be produced.

"Although, as a general rule, it may be preferable to provide two plates between which the lug or bracket on the camera can be pivoted, yet, when desired, only one plate may be provided, whereto or whereon this lug or bracket could be pivoted in the same manner. In this case also the lug or bracket on the camera could be duplicated if desired, and could pass on both sides of the single plate.

"In all cases the pivots, the hinges, and the clamping appliances can be made and fitted in any usual and convenient manner suitable for allowing them to perform their necessary functions aforesaid with ease, rapidity, and certitude."

A NEW FRENA CAMERA.

R. & J. Beck, 68, Cornhill, E.C.

WITH the title of the "No. 00" (or memorandum size), Messrs. Beck are introducing a new Frena camera, taking films of the size $3\frac{1}{2} \times 2\frac{3}{4}$, and possessing several novel features which constitute it one of the simplest and most effective little hand cameras that has been shown to us for a considerable time past. The same form of shutter, diaphragms to the lens, the swing back and level, the finders, automatic indicator, and the other features of the larger and more expensive Frena camera have been retained in the memorandum-size Frena, which carries forty films in a pack, as in the other Frena cameras. The operation of changing the film is effected as before by turning the handle round half a revolution and back, but the mechanism of the film changing has been altered.

Fig. 1 shows a side view of the camera To take out the exposed films, the strap handle having been unbuckled, the back of the camera,

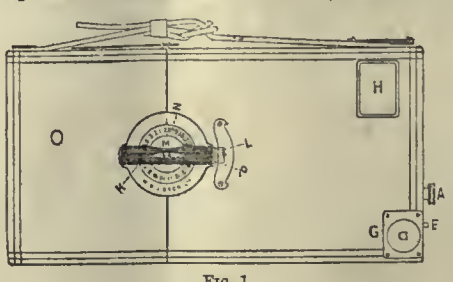


FIG. 1.

O, is removed by undoing the spring catch at the top. The exposed films will be found lying in the back of the camera. It will then be observed that the metal holder which carries the pack of unexposed films, together with the handle, indicator, &c., swings on bearings which fit in semicircular cradles formed by the sides of the camera itself.

This holder may be lifted entirely out of the camera for recharging (figs. 2 and 3). To load the empty camera, a stiff dummy film (fig. 4),

is placed in the holder, the packs inserted exactly as supplied by the makers, and the pressure board snapped into position; the holder is

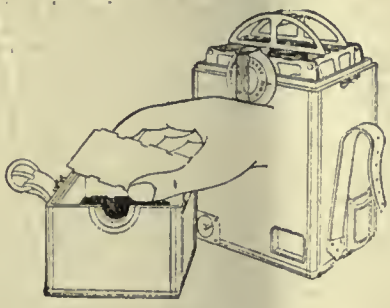


Fig. 2.

then placed in position in the Frena (fig. 2), and the back of the camera snapped on, and the camera is reloaded. The process of changing the film is as follows:—Hold the camera with its lens pointing upwards towards the sky, and grasp the level handle, K (fig. 1), by the ends,

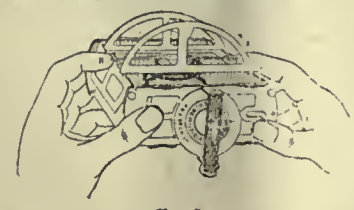


Fig. 3.

which releases the retaining catch; turn it a complete half turn in whichever direction it is free to move, and then return it to its original position. As a matter of fact, the operator will find that each time a

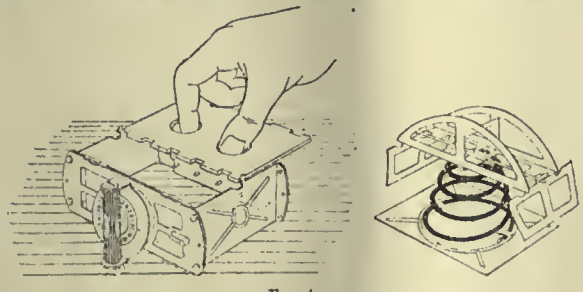


Fig. 4.

film is changed it is turned in an opposite direction, but, as it cannot be turned in the wrong direction, this is no inconvenience.

The camera has a revolving finder, which may be rotated so as to show the exact image that will be photographed in the vertical or horizontal finder hole respectively, according as to whether a vertical or horizontal picture is being taken.

The shutter has five different speeds, $\frac{1}{5}$, $\frac{1}{10}$, $\frac{1}{25}$, $\frac{1}{50}$, $\frac{1}{75}$ second, and also time exposures. For instantaneous exposures the set-off knob is pushed in, and for time exposures the same set-off knob is pulled out, opening the lens, and then pushed in to close the lens. The speed to which the shutter is set is recorded in the lens aperture. The lens is a single achromatic Beck lens, provided with diaphragms operated by a knob on the front of the camera.

The swing back is obtained by simply tilting the holder in which the films are held until the bubble of the level in the handle is central, whatever the angle of the camera may be. This corrects the distortion that may be causad by pointing the camera up or down.

The lens is then stopped down to correct any loss of definition that may be caused by the top and bottom of the film being out of focus. An indicator counts the number of exposures.

The memorandum-size Frena weighs only two and three-quarter pounds, loaded with forty films. It measures $9\frac{1}{2} \times 5 \times 3\frac{1}{2}$ inches.

Results produced by the new Frena are before us as we write, and they are unusually good. The camera is cheap, and from a careful examination made of it we have no hesitation in pronouncing it well made and exceedingly simple to work. It is a step in the direction of making hand-camera work "as easy as shelling peas."

INFLUENCE OF THE RÖNTGEN RAYS ON THE SKIN.

It may, or it may not, be known that the X rays are productive of a serious affection of the skin, if it is frequently subjected to their influence. As a case in point, the demonstrator at Olympia, who has daily experiments to attend to with this force, has his hands, as far as the second joint of the fingers, almost denuded of skin; they appear as if they had been severely scalded, with considerable inflammation and swelling. Suppuration of one finger-end seems to be in progress. Altogether the state of the hands is very painful and unsightly; but with regard to the pain, since the swelling subsided, it has not been much. This is the first case of injury that has been brought to my notice, as I have seen no allusion to it in any publication that I happen to have read, although it is quite possible others may have suffered in the same manner, attributing the affection to something else. Of course, the effects in this case may be owing to something else; but the sufferer, an intelligent man, is perfectly convinced that the Röntgen rays are undoubtedly the cause, and nothing else. On the strength of this opinion I forward you these notes. EDWARD DUNMORE.

Our Editorial Table.

PHOTOGRAPHY ANNUAL 1896.

Edited by HENRY STURMEY. London: Iliffe & Sturmey, 3, Bride-street.

WELL printed and got up, as hitherto, the 1896 Annual of our contemporary, *Photography*, is before us. The prominent features of previous issues are retained and some improvements in detail are introduced. Tables of reference, a list of dealers and dark rooms, practical articles, including contributions on X ray photography by Abney, Swinton & Gifford find place in the Annual, wherein also Mr. Bothamley has an exhaustive record of progress in photographic chemistry during 1895; Mr. Chapman Jones so treating of optics and Mr. Bolas of photo-mechanical printing. Rev. F. C. Lambert summarises artistic progress in 1895. He surveys both the Salon and Royal Photographic Society's Exhibitions with an impartiality as refreshing as it is uncommon. Mr. Albert Taylor as usual deals with astro-photography in 1895, and Mr. C. R. Rowe puts a deal of conscientious work into the compilation of the section devoted to photographic apparatus. There are several excellent illustrations from negatives by Mr. Sturmey, Mr. Rowe, Mr. Harold Baker, and others; and, on the whole, the Annual must be pronounced an admirable production.

THE X RAYS.

By ARTHUR THORNTON, M.A. Bradford: Percy Lund & Co.

MR. THORNTON'S great difficulty in the compilation of this little book has obviously been want of space, much of the information he gives being of a very fragmentary nature. Nevertheless, within the limits at his command, he has contrived to give us one of the most interesting little treatises in connexion with radiography that has so far been published. The earlier chapters are devoted to an elucidation of the theories of sound and light vibrations, and the phenomena of electrical discharges. Thence follows a history of the discovery of the X rays by Rontgen, together with a brief examination of the explanatory theories that have since been published with regard thereto. The photographic aspects of the subject next engage attention. Mr. Thornton is concise and clear in his exposition, and shows that he is at home in the practice as well as the theory of radiography.

SHAKESPEARE'S TOWN AND TIMES.

By H. SNOWDEN WARD and CATHERINE WEED WARD.
London: Dawbarn & Ward, 6, Farringdon-avenue, E.C.

WE look forward to the time when this book, which is obviously the outcome of a loving and painstaking study of a facinating theme, shall have secured the matured fame of a cheap edition, for, while in all probability the Shakespearean scholar will welcome it, the very humblest reader of the bard cannot fail to be interested in, and instructed by, the plain tale of the great poet's life and surroundings that it sets forth. Stratford-on-Avon and district are exhaustively described, while the poet's ancestry, childhood, boyhood, youth, and courtship; his struggles in quest of a fortune; his manhood and close of life are dealt with in a series of ably written chapters to which are appended useful information for visitors, a map of the district, Shakespeare's will, and other interesting items. The authors appear to have spared no trouble in research to verify their facts and dates, so that the literary portion of the book has all the stamp of being a thoroughly careful and conscientious history.

From the photographic point of view, the chief attraction of the work lies in the illustrations, of which, in all, there are considerably over a hundred. With few exceptions, no clue is given as to who

was responsible for the original photographs, but it is safe to conjecture that these are the work of Mrs. Snowden Ward, whom we know to have passed much time at Stratford with the camera. Without exception, the photographs, depicting scenes in and about Stratford—old houses, memorials, streets, churches, monuments, tombs, interiors, copies of paintings, land and river scapes, statues, portraits, mostly suggestive of or conveying an idea of the surroundings of the poet and Anne Hathaway in the spacious sixteenth century, have been admirably executed. Indeed, some of the interiors, for technical and artistic excellence, would be difficult to excel. The illustrations are in half-tone by the Swan Engraving Company, and are qualitatively above reproach. Messrs. Allen & Carruthers, the printers, of Chiswick, have turned out the volume in faultless style; paper and type have been well selected, and we should like to pay a special compliment, rarely accorded, to the makers of the inks used—Messrs. Shackell & Edwards—who have enabled the fullest justice to be done to the exquisite blocks and typography.

All concerned, and especially the authors, are to be congratulated on the production of a book in every respect worthy of its great subject, and which deserves to secure a permanent place among the literature devoted to William Shakespeare.

News and Notes.

SLUM-LIFE PHOTOGRAPHY.—This month's *Quiver* leads off with a brightly written and telling article on the inhabitants of Slumland by Mr. Hector Maclean. Of special interest to our readers are the illustrations, which have been reproduced from photographs by Mr. Edgar Scamell. Although the printing and paper of the magazine hardly do justice to the blocks, a liberal amount of line and hatch has been put in by hand, which, although photographic purists may object, certainly helps to give vigour and finish to the half-tone reproduction. The above clever collaboration of photographer and writer is an example which might with advantage be followed.

I ENTIRELY dispute the contention that the lantern is in its decadence. Its possibilities are only being recognised, and whether as the adjunct of the scientist or the explorer, or simply in embellishing the text of the entertainer, lantern slides will ever be in demand by the lecturer. It is only when the lantern is abused that spectators tire. There is surely nothing so wearisome to the eye and brain as the rapid passing through of a stream of "linkless" pictures one after the other, with no description beyond the bald announcement of the name of subject. What is required is a lecturer who can appeal to his audience through the force of his periods, and heighten the interest of his subject by the illuminated examples he throws on the screen before them. —*Journal of the Photographic Society of India.*

GERMAN GLASS INDUSTRY.—According to the *Handels Museum* the glass industry of Germany can be divided into two groups, the one including works which produce glass out of the raw material, while to the second group belong those factories which receive glass from the former, and improve it by blowing and cutting At the present time there are 312 actual glass manufactories in Germany, with 50,000 *employés*. In these factories glass and glass wares are produced for consumption, such as bottles and other hollow glass, mirror, and window glass. Of these factories, 187 are in Prussia, 54 in Bavaria, and the remainder in the other German states. To the second group of this industry belong 163 establishments, with 9000 *employés*, so that the total number of factories producing and improving glass in Germany is therefore 475. Of these, 241 are in Prussia, 108 in Bavaria, 33 in Saxony, and the remainder in the smaller German states. The glass industry of Germany has to contend against a very keen competition with Austria-Hungary, Belgium, and France —all these countries, owing to advantages obtained by their commercial treaties with Germany, being able to import into the latter country large quantities of glass and glass wares.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
10.....	North Middlesex	Technical Meeting.
11.....	Birmingham Photo. Society ...	Exhibition of Competition Pictures taken upon the Excursions to Arbury, Compton Wynyates, and Stokesay.
12.....	Photographic Club	Members' Open Night.
15.....	Borough Polytechnic	Excursion: Streatham and None-such Park.
15.....	Croydon Microscopical	Excursion: Nutfield. Leader, A. Roods.
15.....	Darwen	Excursion: Langho and Dinckley Ferry. Leader, James Cooper.
15.....	South London	Excursion: Ockshott and Esher. Leader, J. T. French.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 30,—Mr. R. A. Hodd in the chair.

The HON. SECRETARY recounted some tests he had made with a view to ascertaining whether the peculiar markings on negatives brought up and discussed at the previous meeting might be attributed to some action of the material used for the hinges of the slides, or the varnish used for blackening their interiors. A portion of the hinge stuff was put in contact with the plate, and some of the black smeared on the slide; but, although development was forced until fog set in, no trace of an image was found. Two further exposures showed nothing of a retarding or accelerating action, and the negatives were practically perfect. It may be due, as suggested, to the acid state of the glue. It was thought that the exposures had not been sufficiently long, and that the plates should have been left in the slides for fifty hours, so as to compare with other tests.

He further drew attention to a note in THE BRITISH JOURNAL OF PHOTOGRAPHY on the roller-blind shutter, in which Dr. Krügener compares the use of this form of shutter immediately in front of the plate with one used in front of the lens. He finds that the shutter in front of the lens is quite as effective as when used in front of the plate. The Hon. Secretary thought this was rather anomalous.

Mr. J. E. HODD opened a discussion on

UNDER-EXPOSURE, AND HOW TO MAKE THE MOST OF IT.

Granted that the appearance of an under-exposed negative was known to all, he considered that the retention of the normal developer, trusting to additional alkali to finish the development, was very unwise, resulting generally in fogging the whole plate, without improving the shadow detail. Tentative development only was reliable. He did not consider that any of the newer series of reducing agents, used alone, were superior to pyro, with the exception of glycin, although, *in combination* with pyro, some of them were valuable, rodinal being the best. The following formula has answered well:—

1.

Pyro	1 ounce.
Potassium metabisulphite	¼ ,,
Water to	9 ounces 1 drachm.

2.

Potassium carbonate	1 ounce.
Sodium sulphite	½ ,,
Water to	10 ounces.

3.

Potassium bromide	1 ounce.
Water to	10 ounces.

For a normal developer, take of pyro solution 20 minims, alkali 2 to 3 drachms, bromide 5 minims, in which a correct exposure should begin to appear in from thirty to fifty seconds; but, if the time of appearance is much in excess of this, a fresh solution, composed of pyro solution 10 minims, alkali 1 to 2 drachms, bromide 5 minims, should be substituted, with the addition of five drops of rodinal per ounce. Glycin was found to be a very fair developer with under-exposures, and there was no tendency to fog. As regards a preliminary soaking in alkali, he considered it increased the chances of chemical fog and frilling, and preferred the application, locally, of rodinal for bringing out detail. An improved negative may often be obtained by making a transparency, developing for detail only, and from that a second negative. A coat of matt varnish, tinted, if necessary, with aurantia on the glass side, will be found to strengthen the shadow detail, that on the high lights being scraped away. A matt chloride paper would suit this style of negative.

Mr. HENDERSON, with reference to time of appearance of the image, said the gelatine films of no two batches of plates were equally hard or soft, and one would take, say, a minute against a few seconds in the other case. If the plates were previously thoroughly soaked in water, the rule might apply. As regards the treatment with alkali first, if there were a small quantity of bromide, mixed with the alkali instead of fog, you would get clearness. He recommended bleaching the negative with bichloride of mercury and exposing to light, when a great improvement would be noticed. In reply to a question, he advocated soaking in water, provided it be pure. Although development did not start so soon, it caught up later, and did not take any more time in the end.

Mr. MACKIE recalled a statement that the speed of the plate would be increased by treatment with an alcoholic solution of caustic potash before exposure. He had subjected one-half of a plate to this solution, and on flowing on the developer the portion treated flashed up immediately, but by the time sufficient density was obtained he could not see a dividing line, and it appeared as if not treated at all. There was no hard-and-fast rule as to developing. In the case of a very rapid plate of 200 Hurter & Driffield and an ordinary plate, both proportionately under-exposed, he would, in the latter case, put on the alkali first and add the pyro gradually, but this would fog the fast plate.

The HON. SECRETARY found that the activity of the developer was greatly increased by the use of warm water up to about 80° or 90°, and preferred that to adding ammonia.

Mr. TEAPE thought there was an unnecessary fear of getting fog. He always developed under-exposed plates until they did fog, and thought they were better for it and printed softer.

The HON. SECRETARY mentioned that hypo, if added to pyro developer at starting, was said to have no effect, but, if added when the plate was half developed, it helped the detail out.

Mr BANKS agreed that preliminary soaking in alkali was beneficial, but it should not be in the form of ammonia. Carbonate of potash or soda would do.

PHOTOGRAPHIC CLUB.

JULY 29,—Mr. E. W. Foxlee in the chair.

The CHAIRMAN welcomed Mr. Charters White, a former member of the Club, to the meeting, and asked him if he had any matters of photographic interest to mention.

Mr. WHITE said that recently he had been doing as little work in his dark room as possible, as he disliked the extreme heat. His photographic work, however, was principally

HISTOLOGICAL WORK WITH THE MICROSCOPE.

In dealing with some of the technical details, Mr. Charters White said that he found a convenient developer to be of prime importance. He had been for some time, and was now, using "Hintokinone," a one-solution developer, which, in his hands, was exceedingly useful and efficient. It gives clean, bright images, and will not stain either the fingers or the plate. Mr. White said that he always gave a full exposure, and then treated the plate to a careful development. Should he find the exposure to be more than sufficient, he diluted his solution, and perhaps added a little bromide; if, on the contrary, under-exposure were present, he should strengthen up his developer from his stock solution. The Hintokinone is a concentrated solution, which has to be diluted with ten times its bulk of water for use.

Mr. NESBITT said that he was glad to hear of any developer which was simple in character and at the same time did not involve the use of the caustic alkalies of potash or soda, to both of which he had a strong objection.

Mr. BRIDGE said that, with reference to Mr. Charters White's remark about diluting the developer to remedy over-exposure, Mr. Alexander Cowan had proved to his own satisfaction, and he thought to that of many members of the Club, that dilution of the developer did not affect the final result.

Mr. FRY said that that was so, but that, as the result was considerably delayed, ample time was given during the operation to select a suitable moment for closing the act of development, and thus a variety of results might be obtained. He added that he thought the statement that no alteration would be effected by the dilution or concentration of the developer must be taken as only obtaining within certain reasonable limits, because extreme dilution tended to give a feeble image, however protracted the action might be, and *vice versâ*.

A member raised the question whether in the experiments and paper read by Mr. Haddon before the Convention the use of silver paper upon which no printed image had been made would be on all fours with similar experiments in which the actual printed image was used. He, the member in question, had a weakness for the actual tests which took place in the workroom. He asked for information, and not in a querulous spirit, as to whether some chemical or physical difference might not make a practical difference between the two sets of conditions.

A general discussion upon the alleged superior stability of the old-time silver prints, the value of gold toning as an aid to permanency, and other analogous subjects of interest to photographers, took place.

Mr. CHARTERS WHITE promised at an early date to give the Club a Travellers' Night. He would show a selection of his Swiss views, of which he was anxious to have the opinion of his old friends of the Club.

South London Photographic Society.—At the last meeting of this Society, held at Hanover Hall, Hanover Park, Peckham, S.E., Mr. W. F. Slater (Vice-President) in the chair, Mr. ALBERT HILL attended, and gave a demonstration of

CRESCO-FYLMA NOVELTIES.

He first dealt with intensification with uranium. The intensifier as at present sold is in an improved form, and is free from the disadvantages of the earlier formula. A negative which is too thin, but free from fog, is simply placed in the solution and left until it is sufficiently built up. If it is afterwards desired to discharge the intensification, and it is unsatisfactory, it can be removed by placing the intensified negative in an alkaline solution, which removes the colour. The negative can, after washing, if desired, be intensified. Local intensification can be performed by applying the intensifier with a brush. Portions of the intensification can be locally removed by the use of a solution of ammonia (one in ten), which removes the colour. The intensifier can also be used for lantern slides, but only red colours can be obtained by its use. The Argura paper, recently placed upon the market, is coated on Whatman's drawing paper, with a large percentage of silver, in order to get a good image. The toning solution is used weaker than with other paper. A good sepia-like tone can be obtained by simply fixing the print in hypo, and, after washing, drying it. No notice should be taken of the colour of the print as it comes from the printing frame. Prints can be waxed by rubbing the surface with a solution of beeswax, dissolved in turpentine. Prints on this paper contrasted favourably with others made on matt-surface papers from the same negatives. The shadows were more transparent. Mr. Hill brought before the notice of the members present some experiments he had been making in the direction of photo-sculpture. He had used bichromated gelatine, and, after printing, fixing it to a glass plate, immersed it in a cresco-fylma solution, which caused the gelatine to expand vertically. Some casts obtained from negatives made in this way were shown.

Patent News.

THE following applications for Patents were made between July 20 and July 25, 1896:—

No. 16,080.—"Improvements in or relating to Apparatus for Taking, Viewing, or Projecting Photographic Images in Rapid Succession to give a Life-like Effect." W. R. ROUTLEDGE, A. ROSENBERG, and W. MCDONALD.

No. 16,303.—"Improvements in Actinometers." G. F. WYNNE.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

To the EDITORS.

GENTLEMEN,—Will you kindly insert this refutation, in your next weekly issue, of a series of unfounded statements which appeared in a photographic monthly of August?

Referring to the Leeds Convention Meeting of the National Association of Professional Photographers, after stating that this Association "*received its death there*," it was stated that there was proposed "a motion that the Secretary be requested to resign, and, this being carried, he promptly left the meeting . . . ., which then closed."

There is not a word of truth in the foregoing statements.

Mr. Barry (Chairman and President), Mr. T. Fall (Vice-Chairman), Messrs. Harold Baker, A. Freke, and other photographers, well known to the profession and to the Convention, were in Leeds all that week, and easily accessible for inquiry and information.

The headquarters of the National Association of Professional Photographers (the Imperial Hotel, Leeds) were publicly advertised in THE BRITISH JOURNAL OF PHOTOGRAPHY, were publicly posted in the Convention Rooms Office, Leeds, and in the halls of the five hotels named in the Convention programme.

Moreover, a full and lengthy report of the proceedings of this Association was published in THE BRITISH JOURNAL OF PHOTOGRAPHY of July 24 and *Photography* of July 23, &c., wherein it was announced that the *next meeting* of the National Association of Professional Photographers would be held in London, on the Monday after the opening day of the Royal Photographic Society of Great Britain in September next.

The Leeds Convention closed on July 18, a fortnight before the publication of these unfounded statements.

It is to be regretted that, with such ample means of ascertaining the truth, a series of unfounded and misleading statements should have been promulgated in a *monthly* periodical, wherein the *amende honorable* could not possibly appear for another month.—We are, yours, &c., D. J. O'NEILL, *Secretary*.

47 *Charlotte-road, Birmingham, August* 4, 1896.

THE W. H. HARRISON APPEAL.

To the EDITORS.

GENTLEMEN,—Will you kindly allow us to publish a final account of the Fund raised as a testimonial to Mr. W. H. Harrison, and to express the thanks of the recipient and his family to all the friends who have so generously contributed to the fund.

The total amount of the subscriptions is 105*l.* 4*s.*, and after deducting 6*l.* 11*s.* (cost of stationery, printing appeals, &c.), there remains a balance of 98*l.* 13*s.*, of which 25*l.* has already been handed over to Miss Harrison, in whose care Mr. W. H. Harrison remains.

The balance of 73*l.* 13*s.* is now held in trust for Mr. Harrison, and will be paid over in monthly instalments of 2*l.* to Miss Kate Harrison, for the benefit of her invalid brother.

Should Mr. Harrison recover during the next three years sufficiently to be able to manage his own affairs, the balance remaining unapplied will be handed over to him, or, in the event of his death, to his sister. These arrangements have been made with the approval of all those most closely concerned.

Any further donation received will be added to the fund to be applied in the same manner.—We are, yours, &c., FREDE. H. VARLEY, ANDREW PRINOLE.

COLOUR PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Under Ex Cathedra, I read with interest about Mr. Bennetto's colour photography. I also note your remarks as to how he does not let a photographer see it. I have not seen any result although living so near, but wish to inform you and the photographic public, that Jane's Colour Photography is not dead or done out, and that photographers and scientists are allowed to see, handle, or have in their private possession, upon signing a form of receipt of same. I am obliged to be cautious as to this, as one good gentleman to whom I sent about twenty of my best specimens has not returned them, and, upon inquiry, I find he has crossed over somewhere. This has caused me great inconvenience and loss of time; this, along with other obstacles, and attention to business, has compelled me almost to abandon my

process for the time. I hope to get something in the Royal Exhibition. I will further confirm my previous statement, that in my process there are *no dyes used*.

I regret I have to sign my name plain "Arthur Jane," and have not a few links or coupling chains at the end of it, so that any that might be able might lay hold, and help on a bit. I have experienced enough buffers, but had very few couplers from the photographic world. Possibly it may not be (scientifically) blended to suit the water of the district.

"Unfinished—I declare it;
Rebuffed—I'll bear it."

I am, yours, &c., ARTHUR JANE.

Crockwell-street, Bodmin, August 1, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Thomas Arthur Moryson, Dumfries, Scotland.—*Four photographs of the Right Rev. Dr. Turner, Lord Bishop of Galloway, Scotland.*

RECEIVED.—E. S. HODGSON; E. HARRISON; W. HAMPSON; W. BENNETTO; and others. In our next.

ALBUM MAKER.—LUX. Lowthime, Lamb's Conduit-street, W.C., will probably meet your requirements.

SPOTTY PRINTS.—T. W. There is very little question that the spottiness arises from the bronze powder with which the mounts are lettered and edged.

LENS.—J. MCKENNON. A single lens will do quite as well for general landscape work as a double combination. Indeed, some of our best workers prefer that form, for that class of subject, to any other.

FERROTYPE PLATES.—E. MORGAN says: "Will you kindly inform we where I could purchase the dry ferrotype plates, also the gilt frames for the same?"—In reply: Of Fallowfield, 146, Charing Cross-road, W.C.

ETHER FOR COLLODION.—A good quality of methylated ether will do quite well for collodion for the wet process. Methylated alcohol, however, as met with commercially, will not do. The unmethylated alcohol is necessary.

TILTING THE CAMERA.—S. STEPHENS. The print shows that you tilted the camera to get in the whole of the structure, but, at the same time, you neglected to bring the swing back into use. If the camera be tilted, the swing back must be used.

YORK MINSTER.—W. W. H. Conventioners were accorded special privileges on their visit to the cathedral town. No doubt, similar facilities are to be obtained by others by application to the proper authorities, but we are, for the moment, unable to say who they are.

PATENT.—R. M. C. You can certainly patent the camera stand, the same as you can anything else, but the patent would not be valid, because the thing has been done before. Indeed, that form of stand was introduced many years ago, and has been superseded by the different forms now on the market.

PHOTO-MICROGRAPHY.—C. THORNTON. We should certainly advise you not to commence with high power. Make your first essays with, say, a two-inch or an inch-and-a-half objective, and attain to good results with that before going higher. With the quarter and eighth of the maker mentioned you will not be troubled with a "chemical focus."

VALUE OF LENS.—C. A. S. We do not undertake to value apparatus, therefore we cannot say what the lens is worth. We may say, however, if it is by the maker whose name it bears, it would be very cheap indeed at the price mentioned, supposing it to be perfect. Before paying the whole of the sum, we should advise you to show it to the maker, who will advise you as to its genuineness.

LANTERN SLIDES.—S. W. OWEN says: "I shall be obliged if you can inform me what are 'photo relief print' lantern slides? I have purchased some slides second hand, and they have that title printed in gilt letters on the mask. They look rather like Paget printing-out slides, or, at any rate, as if they had been toned."—In all probability the slides are produced by the Woodbury process.

ENCAUSTIC.—S. asks: "What is meant by encausticing prints, which, I am told, used to be done to make them more permanent, as well as improve their appearance."—Practically, it was polishing the prints with beeswax, after the manner that furniture is polished. A little of the compound is rubbed over the picture, and polished off with a piece of flannel. A formula for the "encaustic paste" will be found in the ALMANAC.

REMOVING RETOUCHING.—T. MINNS says: "I sent some negatives to one who advertises to do retouching, but the work is so badly done that the negatives are spoilt as they are. Is there any means of removing it? I am afraid to use indiarubber, for fear of injuring the films."—Supposing the retouching medium used was of the commercial kind, the work can be cleaned off, without injury to the film, with a pledget of cotton-wool charged with turpentine.

SALTED PAPER.—C. H. says: "I have salted some drawing paper by immersion, one white of egg, one ounce of common salt, twenty ounces of water. Result, very unsatisfactory; looks as if it were 'unsalted.' Can you give me a better recipe?"—We should say that paper so treated would bear evidence of being *very* much over-salted. We should advise our correspondent in his next essay, if the paper is immersed, to use a quarter only of the salt to twenty ounces of water at most.

EMBOSSING PRINTS.—T. DAVIES says: "When embossing prints in a cameo press, if they are on double albumenised paper, the albumen is often cracked, especially when it comes in direct contact with the die. This does not take place with the less glossy paper. Can you give me a remedy?"—We have no doubt that the trouble may be avoided by embossing the prints before they become "bone dry," that is, soon after they are mounted, and while the paper still retains some moisture.

GLASS FOR STUDIO.—S. WELLS writes: "I am told that some kinds of glass are very prone to turn yellow when exposed to the light for a time. Such glass would certainly be unsuitable for glazing a studio with. Can you tell me the best kind to use for the purpose?"—Some very white glass was in the market many years ago that, by long exposure to light, did change to a decidedly yellow colour, and we are not sure that it is made now. The ordinary sheet glass of commerce answers every purpose, and is very unlikely to change colour.

THE COMBINED BATH.—A. FRANKLIN says: "Kindly inform me whether the chloride papers are as permanent toned with the combined bath as the separate baths. I have sent you the formulæ which I use, and by which I get very good tones, but I have been questioned as to the permanency of them."—In reply: Our and many others' experience points to the fact that there is considerable risk, when using a combined bath, of imparting fugacity to the prints. We should recommend you to abandon the formula—containing alum and lead nitrate—for the combined bath you have been using, and employ separate baths, toning with gold and sulphocyanide, and fixing with plain hypo.

HAND CAMERA.—BEGINNER says: "I have just got a hand camera, but I cannot get a sharp picture with it. On showing the results to a photographer, he curtly told me that I had not properly focussed. That cannot be the cause, because the camera is a fixed-focus one, and requires no focussing. Can you explain the reason the pictures are not sharp?"—No, because there are so many reasons why they may not be. For example, the camera not held still during exposure, faulty lens, or worked with too large an opening, the lens not properly adjusted. If, however, the lens is properly adjusted for distant objects, it will not be in focus for near ones; therefore, if used for such, they will, of course, be out of focus.

DEFAULTING CANVASSER.—PHOTO say: "Will you kindly inform me what to do in the following case? About two years ago I appointed a man as agent for me in a distric. about seven or eight miles from Thornbury. He obtained some orders, which were executed and cash paid; but on the last two orders he has never paid over the money for same, which I know he has received. I did not know the names of the persons he had the orders from, so enclosed the bill of each with the photographs made out in blank. I have made several applications for the money, but have not been able to get it. I don't think it will be much use to put him in the County Court, as he is in debt to so many people in the town. What I particularly wish to know is, do you think he can be prosecuted for embezzlement?"—In reply: Probably a prosecution would lie, but you had better get legal opinion on the matter. The border-line between "embezzlement" and "matters of account" is not always plain.

TONING; LENS.—H. MASON says: "1. I should be obliged if you will kindly inform me, through your Answers to Correspondents column, what toning formula I should use to produce a fine grey tone? I have heard something about a 'salt bath,' but do not know the formula. Can I obtain a grey tone with any make or tint of paper? 2. Will you also kindly say if a No. 2B Dallmeyer lens is a cabinet or *carte* lens? I have one in use, but it will not cover a cabinet plate without the small stop No. 4. I am told it will cover 8×6 plate."—1. It is not stated what kind of paper is being employed, whether albumen, gelatine, collodio-chloride, or platinotype. It may, however, be mentioned that the more glossy the paper, as a rule, the more difficult it will be to get grey tones upon it. Plain salted, or some of the matt-surface gelatine papers, are best adapted for grey tones. 2. The "No. 2B" of the maker named is only intended for *carte-de-visite* size, though cabinet portraits are frequently taken with it when stopped down.

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EX CATHEDRÂ.

The Britannia Works Company have issued a special edition of *Photographic Scraps*, intended for professional photographers only. As far as the Company have been able, they have sent a copy to every professional photographer in the world. This issue of *Scraps* has been written by professionals for professionals, and such well-known men as Byrne (of Richmond), West (of Southsea), Wilson & Co. (Aberdeen), W. Crooke, W. E. Debenham, and Harold Baker contribute short articles descriptive of their experiences with the Ilford plates and papers. The Britannia Works Company are to be congratulated on their enterprise. We may add that, should any of our professional readers not have received a copy of this special issue of *Photographic Scraps*, a post card to the Company will bring one.

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We tender our congratulations to our contemporary, the *Scientific American*, which has celebrated its half-century of existence by the publication of a special number, in which it gives a comprehensive review of the progress of American mechanical science since 1845. The number is full of deeply interesting reading. A short article is devoted to photography, and we observe from the reproductions given that Daguerreotypy was referred to in the very first number of our contemporary. The *Scientific American* has always looked with friendly eyes upon photographic progress, and we wish it a lengthened career in which to continue its encouragement.

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Our *confrère*, Mr. F. Dundas Todd, editor of the *Chicago Photographic Beacon*, sends us the following interesting note with reference to the invention of the fish-glue process: "Hyslop, in conversation with me, frequently claimed to be the writer of the article in the *Artist Printer*, and, so far as I know, no one else has ever done so. The experiments, he said, on which he based the process were made for another purpose in the Camera Club, London, and the idea of using glue for half-tone work struck him in Chicago. I used to see Hyslop almost daily, but for two years I have lost track of him, so cannot refer him to Mr. Gamble's paper."

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A correspondent writes: "May I point out an instance which may have escaped your notice, showing how an author should be careful, in writing stories in which the latest scientific discoveries are introduced, to fully inform himself on the subject. The *Strand Magazine* for July contains the first instalment of a new series of sketches, entitled 'The Adventures of a Man of Science,' in which the scientist, in utilising the New Photography to find out whether a Brahmin had swallowed a valuable diamond, informs us that, after having arranged his subject in such a position that the X rays should pass through his body, and turned off the light in the room, *he removed the cap from the camera*, and, after an exposure from seven to ten minutes, felt certain he had taken a careful photograph. It is curious to note that the same number contains an article fully describing how the New Photographs are taken."

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Mr. Wallace Bennetto writes us, with reference to some remarks of ours, made a fortnight ago, touching his alleged discovery of photography in natural colours: "In some notes you give about my colour photographs you state you 'are surprised to learn from a correspondent that Mr. Bennetto declines to show the results to a photographer,' &c. Will you kindly state that no photographer has ever asked permission to see the pictures, that no one has ever asked on behalf of a photo-

grapher, and therefore the statement is false, and I will thank you to give me the name of your correspondent. I have shown the results to several persons as stated, and hope shortly to exhibit the pictures to the public, of which I will give you due notice." We give Mr. Bennetto's denial the utmost possible prominence. Our authority for the statement that he declined to show his results to a photographer was a Newquay professional photographer.

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It will be seen, by reference to a paragraph which we print under the heading News and Notes, that Mr. Bennetto has declined the challenge of Mr. Bullmore to produce the results. These are to be exhibited shortly, and we hope to have the pleasure of seeing them. We would suggest the Royal Photographic Society's Exhibition next month as a suitable place for their display. We have no desire to say anything that might be construed as prejudicial or hostile to Mr. Bennetto, but, in this matter of the alleged discovery of photography in natural colours, the public has so often been misled by claims and announcements that have not stood the test of analysis, that each fresh "discoverer" has only himself to thank if his statements evoke feelings of scepticism when they are made in newspapers that are not qualified to pronounce an authoritative opinion on the specimens submitted to them.

ENGLISH PATENTS.

Comments have frequently been made in the technical press as to the way in which patents are granted in the United Kingdom. At the English Patent Office no inquiry whatever is made as to whether the invention is new, original, if it has been in use previously, or, indeed, if it has even been patented before. As a consequence, patentees often find themselves involved in costly litigation, which might well have been avoided if only a very limited inquiry had been made by the authorities before the patent was granted. In most other countries a patent is not granted without the authorities instituting an investigation, of some sort at least, as to the novelty or otherwise of the invention for which protection is sought.

In America, as well as in Germany, for example, the inquiry is very complete, and, if it is found that the invention is not new and original, the patent is refused. In the latter country the inquiry is more complete than in the former, and there it is not only necessary that the thing be new and original, but it must also be of public utility as well, or a patent will not be granted. This is a very good point in connexion with German patent law, inasmuch as it prevents a monopoly being created in trifling things which are not worthy of it. Owing to the strict investigation made by the German Patent Office before a patent is given, the validity of a similar patent, under the International patents arrangement, is seldom questioned in any other country. In England the Patent Office simply takes the money and asks no questions, and the same thing can be patented, over and over again, even if it were not original in the first instance. That is not as it should be, considering that the profits of our Patent Office are something like 100,000*l.* a year.

Here is a case in point, in connexion with photography, as to the way English applications are accepted. In our issue of the 24th ult. we printed the "complete specification" of a patent applied for by Mr. Davey for producing embossed portraits, and last week we gave the complete specification, with a brief append, of Mr. Taber for a precisely similar thing, embossed portraits. If the specifications be compared, it will be seen that the two methods are, practically, identical in every particular; yet, in the ordinary course, both patents will be sealed, and the patent will possibly have to be litigated afterwards, unless, indeed, one or other of the applicants is successful in opposing, before the comptroller, the sealing of the other's patent. That involves considerable trouble, and sometimes no little expense. Ten shillings has to be paid on giving notice of appeal, and twenty shillings by each party on hearing by the comptroller. It is rarely that the contending parties appear by themselves—they are usually represented by their patent agents or by counsel. This materially adds to the cost of the proceedings, and each litigant will have to bear his own costs, as none are allowed to the successful party.

It is a curious coincidence that the two applications just referred to were made within about a fortnight of each other, namely, Davey's on October 25, 1895, and Taber's on November 12, 1895; also that the two complete specifications were accepted within about the same time of one other, the former on June 20 of this year, and the latter on July 4 following. Both inventors, it is noteworthy, date from San Francisco, and the patents are applied for through English agents.

It cannot be too strongly impressed upon would-be patentees that the English Patent Office will grant a patent for an invention that may have no originality whatever in it, and which may even have been patented before, though, of course, such a patent would have no validity if contested in a court of law. This being the case, it behoves applicants who desire valid patents to make themselves, personally or through their agents, perfectly cognisant of what has been done previously before lodging their specifications. This, if done personally and completely, involves a great deal of time and trouble; and, if done by a patent agent, of course it incurs considerable expense. A very complete search by a patent agent is sometimes a costly matter, and in the end is not always conclusive in such subjects as photography.

Patent agents mostly confine their investigations to what has previously been done with regard to patents. Some, however, do, when a supposed valuable invention in connexion with such a thing as photography is in question, engage the services of an expert in photographic matters, and who is well versed in what has been done in the past. It is not necessary that a thing may have been patented before to make a subsequent patent for it invalid. It is quite sufficient if the thing has been shown publicly, worked, or published. Many patents now pass as being valid which would be quite upset on this score if contested. In some countries, we believe, prior publication or use does not invalidate a patent, provided the thing has not been published, used, or patented during the previous fifty years. Therefore an invention that may be over fifty years old, if it has been in abeyance the while, can there be patented as a new thing, and the patent will be valid. In England this is not the case, though some patent-law reformers would have it so.

The Action of Light on some Organic Acids in the Presence of Sunlight.—This is the title of a paper forming the thesis written by Henry Fay for his degree of Ph.D. in the John Hopkins University, and it contains a most valuable and interesting *résumé* of early investigations relative to the action of light on various bodies, many of which possess germs of value

appearing to be now quite lost sight of. It is almost impossible to make an efficient brief *précis* of the paper, which itself partakes of the character of an abstract, hence we merely call attention to its most interesting character, pointing out to those who have no means of access to the Proceedings of the University that the paper is being republished, *in extenso*, in the pages of the *Chemical News*, the first part appearing in the issue for July 31.

Action of Zinc on Sensitive Plates.—At a recent meeting of the Paris Academy of Sciences some singular experiments in this direction were described by M. R. Colson. Their outcome is to the effect that it is inadvisable to use cameras, slides, or plate boxes of metallic zinc, as M. Colson finds it to volatilise at ordinary temperatures in quantity sufficient to produce an effect on the plate. The action is energetic with freshly cleaned surfaces of the metal, as, for example, when it is abraded with emery paper, and falls off as the zinc becomes oxidised.

With reference to this remarkable fact and the volatilisation of metals at ordinary temperatures, a further reference was made at a succeeding meeting of the Academy by M. H. Pellat, who stated that, using steel in lieu of the zinc employed by M. Colson, he had obtained quite similar results.

The 1893 Eclipse.—A report at an apposite moment has been issued by M. Deslandres upon the work of the French eclipse expedition to Senegambia to observe the solar eclipse of 1893. As our readers have been made aware, some account of the work done has already been published, but the recent reports given describe the whole plan and purpose of the expedition. with particulars of the work accomplished. The programme involved photography of the corona and its spectrum, especially in the ultra-violet, and a spectroscopic study of the movements of the corona. M. Deslandres finds that, for photographs of the corona, rapid plates are not advisable. He has obtained his best results with plates of medium rapidity. When examining and collating the images on his various plates, this investigator found an annoying difficulty to arise: he was quite unable to determine on one of his negatives whether certain spots that appeared were the result of stellar images, or were mere particles of dust or imperfections of the film. Hence he makes the valuable auggestion that, when searching for intra-mercurial planets, two cameras, at least, should always be employed.

Acetylene.—There cannot be a doubt that thia illuminant holds an important place in the scale of light-giving agents, and is the subject of grave consideration in high quarters. Granted a suitable burner, the light from acetylene is extremely powerful; the points that need consideration are the generators, mode of storage, relative safety as compared with ordinary coal gas. Already there are several generators described, or now placed on the market, some of which take the place of storage apparatus. For storing the gas, the most important plan is that of keeping it in the compressed form, and the statement was quoted at a recent meeting of the Philadelphia Fire Underwriters' Association that a cylinder four inches wide and four feet long would supply sufficient light for a ten-roomed house for three months. As regards safety, acetylene has to be looked at from several points, as its characteristics vary to a great extent from those of coal gas. At the meeting referred to it was stated that, if supplied to the consumer through underground pipes, in the same manner as ordinary gas comes to the consumer, it was just as safe as the latter; but, on the other hand, it must be remembered that it is liable to form dangerously explosive compounds with copper. It is further to be noted that Berthelot has shown it to be an endothermic compound, and so liable to explosions. Thus, if mixed with atmospheric air in the burner, it might strike back into the mains or the gasometer. We are not in a position to say whether this would he sufficient to initiate an explosion of the whole, but it has been experimentally shown that a reservoir of gas is capable of explosion by the aid of a percussion cartridge in the manner best adapted to explode a mass of gun-cotton.

The quality of the light is very restful to the eye in comparison with the electric and incandescent gas lights. In a recently published work dealing with this subject it is stated that a light rich in the violet and ultra-violet rays (such as is obtained with the arc and magnesium light) is hurtful to the eye, these, for example, being the rays in sunlight that bring on sunstroke or erythema.

Uses of Hydrofluoric Acid.—An important article, by Herr Carl F. Stahl, upon the commercial aspects of this chemical, recently given in the pages of the *Chemical News*, concludes by a brief account of various industrial aspects of the use of the commercial acid, and, as many of them would be available in the photographic laboratory, we give here an abstract of them: "The oldest, and, up to the present time, most extensive application is for etching on glass. For this purpose it can be applied in three different ways: in the gaseous form, by suspending the articles to be etched over a mixture of fluor spar and sulphuric acid. This is the oldest way of etching, and I believe most burettes, graduated cylinders, &c., for laboratory use, are still marked in this way. If applied in gaseous form, the acid leaves the surface opaque, while the liquid acid leaves the surface smooth and transparent. For the production of an opaque surface with liquid acid, many empirical formulæ are published, and every glass factory, or, rather, every etching boss, has his own secret formula. But they all aim to produce a mixture of hydrofluoric acid with a fluoride of ammonia, or potassium, or sodium, with which a number of other substances, such as sulphuric, acetic, or muriatic acids, or ammonium, or potassium sulphate, &c., are mixed; but it seems quite unnecessary." It may be noted that some years ago we gave a recipe for such a mixture or etching ink, in which sulphate of baryta was used, and we found it a very useful opaque etching material, the baryta giving it a body enabling it to be used with a quill pen, subserving, in fact, the same uses as the gum added to ordinary black writing ink. It appears that lead glass only requires an acid of half the strength desirable for a lime glass, and needs less time than to do the necessary work. It is further pointed out in the article that it is important that the article to be etched and the etching fluid should be at a temperature of about 15°C.

If any of our readers desire to make use of any of these formulæ, it is well to remind them that, if the strong acid is allowed to touch the skin, a dangerous wound may result. For example, a single drop falling on the hard hand of a workman, though its presence may at the time cause no feeling of pain, is yet capable of setting up a painful inflammatory action in half a day.

ON PRINT WASHING AND PRINT WASHERS.

The Washing.

This subject having recently been brought into prominence, and, to a certain extent, become a topic for general discussion, some account of an experience extending over a period of between thiry and forty years may he of some value. No one estimates Messrs. Haddon and Grundy's most valuable investigations in this matter more highly than I do; hence, though my own actual practice may not coincide with their recommendations, it is from no feeling of opposition on my part that I pen this account.

With regard to practical results, I may say that I have a series of register printa from the last portion of my various negatives bound in volumes, from No. 1 print, pasted in about twenty-five years ago, down to those of the present year. Of the first hundred pasted in the book, such of them as have, by close contact with the adjoining leaves, been protected from access of air, are as bright, and fresh, and free from fading as though placed in the volume to-day; and, with not one-half per cent. of exceptions, the same may be said of

the many thousands that have ever since been regularly placed into the register books, and are still being placed. I have, further, a few hundred prints, kept wrapped in brown paper and stored in a desk, which were taken prior to that time, and date from the very earliest days of alkaline gold toning. The same permanent character, *cæteris paribus*, appertains to them as to those in the books. Personally, therefore, as I appear to have nothing to gain by altering my method of procedure, I am in this position: I thoroughly endorse Messrs. Haddon and Grundy's recommendations, and I believe their system of short washing to answer every requirement, but, at the same time, I have no present intention of adopting it.

My prints receive, on an average, from fourteen to fifteen hours' soaking in running water. I am satisfied with their quality, and most assuredly no one can truthfully say that, in their case at any rate, long washing has the injurious effect that so many writers attribute to it. These remarks all refer to albumenised paper. With P.O.P. or collodio-chloride paper, short washing is a necessity if the best results are to be obtained.

There is one point to be well noted, as it is the key of the position with regard to all washing methods. When removed from the hypo, each individual print must receive, directly upon being removed from the hypo, a preliminary rinse in a separate vessel of water, before being placed in the ultimate washing receptacle. The theory underlying this procedure is simply that thiosulphate of soda, partly saturated with silver salt, in other words, the double thiosulphate of soda and silver, in presence of thiosulphate of soda, is less liable to decompose when in strong solution than when slightly diluted with water. Hence, with prints taken in mass from the fixing solution and placed into a dish of water, there is, though they be well stirred about, much probability of decomposition, when here and there among them some prints remain in contact with but slight admixture of water. It is most probable that, owing to the want of efficiency of washing methods generally, and the bringing about of these objectionable conditions, the complaint of fading through long washing has been promulgated.

It is a well-known and trite observation, though insufficiently understood even now, that the object of washing is less the elimination of hypo than the removal of the compound of silver and hypo from the fixed print. Let any one take a finished washed print, and, after soaking it in a weak solution of hypo, hang up to dry without a preliminary wash. It will, even after the lapse of a twelvemonth, be little the worse. Next, let half a dozen prints be taken from the hypo, placed in a small dish of water, and left there over night, without any stirring; the probabilities are that they will not be fit to look at the next morning. When the every-day conditions of washing are such as to render it possible that some of the prints may remain touching all the while, want of permanency is bound to follow. And herein lies the great virtue of short washing; the prints must be moved about, and individually separated, every chance being thus given for the fixing results to be soaked out. With long washing, it is too frequently the case that the printer expects length of time in the water to compensate for incomplete handling of the prints, especially in the first and second washing water. A case that came under my own personal observation may be here quoted to show what will suffice for some first-rate men. Many years ago I was invited to visit and advise upon certain matters a provincial photographer of the very first rank, one of the pioneers of the art and doing a large business. I was taken through the printing department at the close of the day, and the prints had just been placed to wash. The plan was simple, and as bad as simple. A large number of prints were placed in a twenty-four inch porcelain dish, slightly tilted; a water tap was placed over one corner, the water turned on, and allowed to run out of the opposite corner—the spout or lip! Upon my pointing out how inefficient such a system was, the proprietor blandly replied, "Oh, but the tap is running all night, and they get eighteen hours' washing." It is quite certain that in half an hour's time the prints would slowly collect in a compact mass towards the efflux end of the dish, and the fate of the prints would entirely hang upon the manner of their treatment when first placed in the water.

From the very earliest days of the alkaline gold toning, following the indications of Messrs. Davanne and Girard's classical investigations, the plan of a complete preliminary rinsing has been the leading idea of my practice, and should be of every one's; and to it almost wholly do I attribute the immunity from fading my prints have enjoyed when not subjected to other later disturbing influences. Such being the case, my further recountal of personal experience with washers may be robbed of some of its value or interest. Nevertheless, for those who care to peruse it, the following description is given of

The Washing Apparatus.

In the very earliest days when attention was given to washing under a proper system, the desirability of a frequent complete change of the water was pointed out, the method of turning the tap on to the prints, &c., and letting the water run away was shown to be imperfect. It is perhaps over thirty years ago when this was proved by calling attention to the length of time it would take under this system to get rid of the colour produced by putting a pint of ink in a bucket of water and turning the tap on. The ink representing hypo, it was seen that the latter would be equally slow in being removed. Hence, at a very early stage, "siphon washers" were devised. The prints were placed in a vessel from the lowest part of which proceeded a siphon, whose bend was on a level with the surface of the water when at its maximum height. As soon as this was reached, the siphon was to begin to act, and, having a large bore, it would empty the vessel quickly (though water was coming in all the while) and then cease to act. The water thereupon began to fill the vessel again, and so on, automatically.

Practical men know that, as a matter of fact, this alternating action did not necessarily continue, for sometimes the siphon would continue dribbling off the water for quite a long time. Still, on the whole, the apparatus acted well, and it had a great repute. The first apparatus of the kind that I remember being offered for sale was made, I believe, by Bull, of Great Queen-street, and was a good one. The vessel was in effect a shallow bucket of zinc with straight sides; the siphon was placed inside, and had the longer limb passed through the bottom. The prints were prevented from being drawn into the siphon by means of a false bottom of perforated zinc. This pattern was made for many years, and until very lately was offered for sale, made of semi-porcelain ware. The objection to it was, that when the water emptied itself the prints would lie in the corners, and, forming a kink, never become detached during the whole of the washing, unless periodically attended to by hand. I determined to devise an improvement. After trying many experimental forms, I gradually evolved a shape that I adopted and kept in use till about a dozen years ago, till indeed cabinet pictures became the rule rather than the exception. These washing machines were for *carte* work, it will be understood. The ultimate form I designed was in principle the same, but, instead of a closed, cylinder-shaped vessel, I had one constructed of sheet zinc shaped like a deep saucer, three feet in diameter, with the siphon starting from the centre. One-third of it, the central portion, was a piece of perforated zinc carefully soldered so as to leave no surface roughness, and separated only by a fraction of an inch from the main body of the saucer. This was a perfect form. The great difficulty was to devise a mode of introducing the jet or jets of water that would keep the prints well separated. The prints would either congregate in a compact heap in the middle of the water, or be propelled to one part of the side of the vessel and obstinately stick there. I tried an immense number of forms, and finally hit upon what was practically a perfect method. Four upright and shaped lead pieces were soldered just above the saucer edge, and upon them rested a circle of lead piping, into which the water was led by an indiarubber tube. Out of this circle projected four short pieces of narrower lead piping through which the water issued into the dish, these small tubes being compressed at their ends to a narrow elongated aperture. The whole secret of successful practice lay in the way these four water jets were arranged. If they were bent so as to cause the water to issue from each in a jet parallel to the sides, a rotary motion was certainly imparted; but the prints did not change their position relative to each other. If, however, three of the jets issued in a direction parallel to the side, and the fourth jet came out in a line crossing them, pointing, indeed, very nearly to the centre, the rotary motion was not destroyed, but each time a print passed this jet it was

caused to gently slide over its neighbour, and all the prints in turn changed places.

So long as prints of small size, such for example as *cartes*, with a few cabinets only, were placed in the apparatus, its action was perfect; but, when cabinets came to be in more frequent demand, it was found that they were liable to become doubled up, and remain so through all the flushings and emptyings, with the result of a permanent disfiguring crease.

So serious did this evil become, and so apt were the prints to mass together, with, at the same time, the peculiar evile of the siphon system—the ceasing to refill as the level of the water became low—that it was felt necessary to entirely revise the plans for washing. I may incidentally remark that I also had large bowls of Doulton ware made on a similar system; but, apart from the great cost of the earthenware, I found the zinc the handiest to use, the coat of Japan varnish given to them, to prevent the action of zinc on dissolved silver, lasting a long time. The Doulton-ware bowls were made with perforations from the bottom to about half way up the sides, and with an outside projecting ledge whereon to fasten the funnel-shaped outer part which carried the siphon. All these, however, were thrown aside with the increase in cabinet portraits. The final plan adopted was a modification of the apparatus I had long before that time made for larger-sized prints, and is here described.

Square or Frame Washers.

As it would be quite impossible to have 12 × 10 and larger prints whirling about loose in a washer, I had made, about thirty-years ago, a washer, which to this day is quite efficient. The washer proper was a deep, square, wooden box on legs, with a siphon outside, the short leg being led inside the trough close to the bottom, and secured by a flanged end, puttied, and nailed into its place. The whole trough was coated several times over with shellac solution to keep it water-tight, and the joints of the sides and bottom were filled in with paper and white lead. The prints were placed in this on a series of trays, which were piled one on the other till only an inch or two of water rested above them. The construction of the trays was peculiar. It was a first necessity that they should be easily removable. To realise this, their framework was made of thick wire bent into a rectangular form, slightly smaller than the inside of the trough, with the object of rendering it easy to pass the fingers between a tray and the sides of the trough. To prevent these rectangles slipping over each other through not fitting closely to the box, each wire corner was made into a kind of loop, so that the tray fitted exactly in place. To prevent the trays actually touching each other, a short small foot was made by soldering a piece of bent wire at each angle of the frame. These were constructed for me by a manufacturer of galvanised wire netting, the whole frame being galvanised after being put together, thus making it compact and free from possible bare iron, which would lead to most undesirable iron rust. The framework made, it was readily converted into a tray by wrapping thin twine tightly round it, beginning at one end and finishing at the opposite. When the prints were ready to wash, after their first preliminary douche, they were placed one by one on the trays, which were then fitted in the trough, their own weight keeping them down, and the water gradually run in by means of an upright pipe running the whole height of the trough, and perforated with holes for the issue of minute jets of water? I preferred the use of twine before netting for the supporting medium, as it lent itself to causing the print to form a series of furrows, as it were, which allowed the water, when the trough emptied itself, to run off instead of lodging in hollows.

This trough, as I have said, lasted for many years. I had several of them of different sizes made, and eventually there was evolved from them a still larger one, constructed on similar lines, and yet more substantially built. This I use for both large work and *cartes* and cabinets. The mode of construction is the same, the details only are altered. Large troughs are difficult to keep water-tight if made of wood only, so that my later patterns are lead-lined, and the incoming water is all distributed over the surface by means of a copper tube, which runs round the top of the trough, and is perforated with minute apertures, so throwing the water like fine rain, and causing no current. The washings from the prints thus fall towards the lower part of the body of liquid by their own gravity. The water leaves the trough at the bottom by means of siphon, which is ingeniously devised to act as a mere overflow pipe or in the usual siphon fashion, at will, by opening or closing a small cock let into the bend of the siphon. I do not know whose invention this device is, but it was made for me by Messrs. Marion.

The trays for this trough are framed of wood instead of iron, and are somewhat like an Oxford frame in shape, to enable them to be handled and removed with ease. It is necessary to weigh them down when stacked and full of prints. Instead of using twine as the supporting medium—which I found apt to cause marks upon the prints, if they were left half dry upon them for any length of time—I ultimately hit upon gutta-percha cord. This is admirable in every way; it never marks the prints, there is no chance of its retaining any hypo and transferring to a print, and it can be readily cleansed. It is attached to the frame by means of small nails driven into the edge of the latter. The cord is secured to the first nail, passed across the frame, bent round the nail on the opposite side, then taken to the adjoining nail, across the frame once more, and so on till the whole is covered with a series of chemically inert, thin bars. On these frames are placed midgets, *cartes*, cabinets, twelve by tens, and so on, which rarely, if ever, become displaced during a whole night's washing, and which have every probability of being thoroughly washed, as no one print is ever in contact with another.

Finally, though I do think, if my advice were asked, I should say, Follow Messrs. Haddon and Grundy's plan of operations, I yet adhere to my old and tried plan of washing all night, feeling sure that, however careless a printer might be at work, he could not fail to put in the pictures in a way which would ensure their perfect washing quite automatically. G. Watmough Webster, F.C.S., F.R.P.S.

BY THE WAY.

Had I suspected, when I wrote last month the few lines about the nonsense that is talked on the subject of "amateurs and professionals," that I should have apparently hurt so many susceptibilities and brought down upon myself such a volume of abuse, I should have hesitated before writing, or perhaps altogether have refrained from penning the lines I did; but, having committed myself, there is nothing for it but to boldly "face the music."

Since those lines appeared in print, I have received a large number of indignant, and in some cases most abusive, letters from individuals who are without exception entirely unknown to me, and, I dare say, to the greater part of the rest of the world, apparently charging me with personally insulting them. As I cannot trace the name of any single one of my correspondents as having been in any way, publicly or privately, connected with any discussion on this seemingly very delicate subject, I am utterly at a loss to comprehend how I can be held to have had any hidden personal meaning in my brief remarks; but I *am* surprised at the number of strangers who find "the cap fits." The imaginary sting of my remarks appears to lie in the allusion to "a certain class of professional" and one individual concludes a more than ordinarily rude epistle by surmising that, in my "promised growl," I intend to "put the honest professional lower down than he is already, and praise up to the skies the wretched thing that calls itself an amateur." This is only one example of how the "honest professional" of a "certain class" jumps at false conclusions, but it seems to be the general idea running through my correspondence; I can only reply generally, that I am distinctly of opinion that, if these critics are fair samples of the noble creature that "calls itself" honest professional, I am distinctly of opinion that it would be far beyond my powers to place him lower than he has already placed himself.

The whole gist of the matter resolves itself into a misapprehension of facts, or at least of terms, and it was that circumstance that induced me to speak of the nonsense that is written with regard to the amateur question. The real amateur can in no sense be considered as interfering with the professional any more than my Lord's brougham can be looked upon as an infringement of the rights of the hackney cab; but, if my Lord authorises his coachman to fill

up his spare time by taking "fares," the somewhat touchy body that watches over the interests of "cabbies" would, provided he took out the necessary licence, have no legal cause for complaint, I imagine; and it just strikes me, to pursue the simile a little further, that in photography, as in other branches of industry, the cab trade being no exception, probably the public is better served by the "amateurs" who take up the business boldly than by many of the thorough "pro's." who rail so loudly on the subject.

But the quasi-amateur who takes up photography originally, perhaps for mere pleasure or because it is fashionable, and gradually drifts into selling his pictures whether at a profit or a loss, is no more an amateur than are the aristocratic cab-owners of the metropolis, but purely and simply a professional in a small way of business; and, so long as this is a free country and there is no licence required to use a camera or to sell photographs, there is nothing to prevent any one who possesses the necessary skill from doing just as he pleases in the matter of either making a profit out of his work or selling it at a dead loss to only partially recoup the expenses. But, when the shoe is found to pinch, it is not the right thing to make it a question of amateur *versus* professional, for it is simply a matter of trade prices: and if the so-called amateur can do better work, get more customers or work for less money, so much the worse for the professional, who can't or won't. He feels it hard, no doubt, and it is calculated to make him sore, to find his business falling off, and prices going steadily down, but don't let him lay the blame on innocent shoulders —those of the amateur.

The same sort of thing has been going on since the earliest days of photography, and no one, not even the highest in the profession, can dream of getting the same prices as in the "golden days" of the Daguerreotype. Except in very few instances, it has always been the energetic and enterprising artist, who was willing to do really good work at a moderate price, who has done the biggest business; and it has ever been the "slow coach," or the incompetent, who has shouted loudest against "cutting" prices. I well remember the outcry there was many years ago when a leading firm of fashionable photographers brought their prices down to seven-and-sixpence per dozen for *cartes-de-visite*; but it was not the leaders of the profession that complained most loudly or at all, but those whose inferior work put them out of competition. Quality will always command its value, and in photography, as in every other business, it is a case of the survival of the fittest, and it is the weaker and inferior that go to the wall first and make the loudest outcry.

That is just about what I meant when I wrote of the nonsense that is talked on the amateur question, which is really no amateur question at all; I had no intention to either belittle the professional or bepraise the amateur. Each in his way stands alone and beyond personal comparison. The only possible comparative test is that of quality of work; but, whether that be good or bad, the true amateur can never in any way interfere with, or injure, the professional, who, in turn, if of the "right sort," will never find any cause to fear a competition that does not exist. In the words of the presidential address at Leeds, "Let us all be known as photographers," and, if any distinction be necessary between different classes of *traders*, let it be "profession" and "shamateur" (to use the happy definition suggested some years ago), but leave the *amateur* out of the quarrelling.

I had no intention of discussing the *pros* and *cons.* of an already well-ventilated subject, or of suggesting any remedy for the present state of affairs, for such I deem to be an impossibility. But there is one phase of the question that is harped upon by nearly all my critics, as well as by almost every writer on the professional side of the subject, for years past, to which I cannot help alluding. I refer to the allegation that amateurs are supplied by the dealers with their materials on as good, if not on better, terms than the professional; and, as was said only a short time ago that, thanks to our advertising annuals, every one now knows exactly the price of everything, and consequently will not pay reasonable prices.

Now, so far as the first part of the statement is concerned, I for one can see no reason why a professional photographer should be charged any less for an ounce of pyro, say, than an amateur. It is a custom, I know, in the druggist's trade to have a sliding scale of terms, and "doctors' prices" are materially lower than those charged to the general public. But this is only a private arrangement between the chemist and the medical man, in order to secure a good and regular customer. Similarly, no doubt, if any professional photographer would give his undivided trade to any one dealer, "special terms" might probably be arranged if it were worth the dealer's while; but, sad to say, in these days of competition, I am afraid the professional likes to buy in the very cheapest market just as well as the amateur, and would not long adhere to any such arrangement if he saw a chance of doing better. He, at any rate, has the advantage of being able to buy in quantity, and so secure an extra discount; but, if he be one of the class who used to go down to "the Cut," on Sunday morning, for two ounces of collodion, he must not expect the special terms usual with "shipping orders."

It has been also said, I think, lately, that the dealers nowadays study the amateurs in preference to the professionals. Well, I should think the dealers very much wanting in common sense if they did not give so little attention to the "predominant partner." The professional has mainly the amateur to thank for the low prices at which he can himself get his goods now, as compared with a few years ago. What but the immense increase in the number of amateurs has brought down the price of pyro, within very few years, from four-and-sixpence to a shilling an ounce? In the ante-gelatine days the relative proportions of the professional and amateur element were so different from what they are now, that the larger quantities of material consumed by the former made him the better customer, and so worthy of special consideration; but, nowadays the amateurs so vastly outnumber the professionals, and, as it has been facetiously if cruelly said, "spoil so many more plates," that they cannot now be relegated to the "back seat" they formerly filled.

With regard to the production of trade enlargements, another point that has been raised, there certainly would seem to be ground for complaint against the enlarging firms if, as alleged, they supply enlargements to amateurs on the same terms as professionals; but, so far as I am aware, the "trade terms" issued by such firms are subject to the production of business card if the customer be unknown, and I imagine that those who cater for the trade only would be careful to observe the rule. But even here a complication arises from the competition of the "stores," who will supply single enlargements to their customers at precisely the published trade prices. If, then, the enlarging firms adhere strictly to their trade rules, the professional photographer is very little better off. As regards the "shamateur" it is a matter between him and the enlarger, who must elect to class him either as an amateur or a trader as he chooses. If he wants the enlargements "to sell again," he is clearly entitled to some discount or allowance from the prices usually charged, and, as published prices are at everybody's finger ends, he cannot get much out of the transaction except at trade prices.

And that brings me to one point or argument in which the professional impeaches himself, namely, the statement that the public is so well educated in the matter of trade terms that they will not pay *reasonable* prices. I have known, as an absolute fact, an enlargement, which, made and framed complete by a firm of trade enlargers at a cost of seventeen or eighteen shillings, with perhaps a shilling or two extra for carriage, &c., was charged to the customer three guineas and a half. This may be an extreme case, but, if it be anywhere near the ordinary professional's conscientious idea of *reasonable* terms, I don't wonder at the lay public refusing to pay them.

To sum up: I hold no brief for either professional or quasi-amateur. The real amateur is out of the question altogether, but I want to show where the difficulties lie between the two. Until there is some sort of tax or licence levied, or until the photographic tariff is placed under a compulsory trade union, the same sort of difficulties must continue; but, while they exist, it is absurd and ridiculous in the extreme to blame the amateur. Our societies might commence to do something in the way of having a sharper line drawn between amateur and professional, but *I* scarcely like to suggest in what direction.

DOGBERRY.

FOREIGN NEWS AND NOTES.

Yellow Screens.—An important paper, by Dr. Otto Buss, appears in the current number of the *Photographische Correspondenz* upon the action of various yellow dyes upon the spectrum, particularly with regard to the ultra-violet. Picric acid, safranine, Martin's yellow, naphthol yellow S., aurantia, fast yellow, metanil yellow, and auramine all show more or less absorption of the visible blue and violet end of the spectrum, but yet allow considerable quantities of the ultra-violet to pass, and in most cases the distinctly marked bands of non-absorption lie beyond λ 360. Several vegetable colouring matters were also examined, such as saffron, turmeric, mace, euonymus petals, and also some of the pure crystalline colouring matters, such as xanthophyll, xanthacarotine, and of these the xanthophyll completely absorbed the ultra-violet, and, if it were possible, this would make a good isochromatic screen. Alcoholic extract of the yellow petals of corydalis lutra, primula elatior, calendula, and carthamus, and the yellow colouring matter of the lemon absorb also the whole of the ultra-violet.

Dr. Buss points out that most of the existing formulæ for yellow screens are extremely unsatisfactory, and that they, like the commercial glass screens, only absorb the rays from H in the violet to G or F, and, because our eyes are extremely insensitive to these rays, a slight damping of these rays is falsely recognised as total absorption, whilst actinic rays may still pass; and the only way to really test a screen is by photographic examination of a dye in quartz spectroscope, which permits the whole of the ultra-violet to pass.

Some Well-known Formulæ.—As an example of how some of the screens act, he takes Vogel's formula for making yellow screens, which is a solution of aurantia in collodion 1:250; 20 c.c. of this being allowed for a screen 13×20 c.c., the thickness of the resulting collodion film would be $\frac{20}{13 \times 20} = 0{\cdot}0077$ mm. Buss points out that he used a solution 1·5000 in a thickness of 5 mm., which was thirty-two times stronger than Vogel's, and yet this allowed ultra-violet light from λ 370 to λ 300 to pass, and he sarcastically asks, "How much more, then, would the thirty-two times thinner film allow to pass?"

The Absorption by Glass.—It might be assumed that the glass itself of the screen or the lens would absorb the ultra-violet, but Eder and Valenta have pointed out that 1 c. of the most ultra-violet-opaque glass only absorbed up to λ 340, and, as the glass used for screens is very much thinner, this cannot be taken into account. Further than this, it is pointed out that even the thick lenses of the present day are really very transparent to the ultra-violet, and therefore could not make up for the weakness of the screens.

Dark-room Windows.—The use of aurantia, picric acid, auramine, &c., for making dark-room window screens, ought therefore to be avoided, and it is quite possible that the use of these absorbents may account for many fogged plates. Every material used for blocking out light from the dark room ought to be tested in a quartz spectroscope to see whether it allows any ultra-violet to pass or not.

The Ultra-violet in Practical Work.—The action of a yellow screen is to cut down the blue and violet so that the maximum action of light may be in the yellow and yellowish green. Our eyes are quite insensitive to the ultra-violet, and cannot discern whether a particular light contains ultra-violet rays or not, and Dr. Buss states it is quite immaterial whether ultra-violet rays play any part in an ordinary orthochromatic exposure or not, as long as they do not increase the action of the blue and violet rays. If we use, therefore, any substance as a yellow screen which absorbs the blue and violet, but which allows the ultra-violet to pass, we permit the latter to intensify the yellow and green, and thus photograph the yellow and green by yellow, green, and ultra-violet rays. A yellow screen, which transmits the ultra-violet will enable us to obtain a stronger action in the yellow and green than one which absorbs the ultra-violet.

Alizarine Blue Bisulphite.—Dr. Eberhard, of Gotha, continuing his researches upon orthochromatic plates, suggests bathing a Cadett lantern plate (black tones) in the following sensitiser:—

Water	100 c. c.
Alizarine blue (1 : 500)	100 „
Rose des Alpes (1 : 200)	2 „
Ammonia (sp. gr. 0 : 91)	1 „
Silver nitrate (1 : 40)	46 drops.

The solutions are mixed in the above order, well shaken and filtered, and the plates bathed for two or three minutes. The red sensitiveness of these plates is very high, and the strong sensitising action of the Rose des Alpes (Thiodichlortetraiodo fluorescence made by Durand, Huguenin, & Co., of Hüningen, Elsass) appears from $C\frac{1}{2}$ D to E, so that a very nearly closed band from the extreme red to the ultra-violet is obtained.

Two well-known Men.—M. Adolphe Martin, and M. J. H. Voight have gone over to the big majority. M. Martin calculated out and constructed most of the instruments in the Paris Observatory, and his name will probably be familiar to many as a maker of photographic lenses, and as the author of a very good method of silvering glass. M. Voight was, for many years, the President of the Frankfort Photographic Society, and a constant contributor to foreign journals.

Action of Light on Uranyl Oxalate.—Mr. Henry Fay, contributes a long paper on the action of light on various uranyl salts, and amongt them uranyl oxalate, which is very rapidly reduced to uranous oxalate, the sensitiveness being much greater than ferric oxalate. It is curious to note that very little use is made of the light sensitiveness of uranium salts, although it was suggested in 1889 by Alleyne Reynolds to use uranyl chloride in combination with sodium ferric-oxalate, and chloro-platinite of potassium, when the uranyl would be reduced to uranous chloride, which in contact with the ferric salt would reduce the latter to ferrous, and itself be converted to uranyl chloride again, the resulting image being very soft and free from solarisation.

"Niederschlags Membran."—By this pretty title, which may be translated by "membraneus precipitate," Liesegang designates a peculiar surface precipitate, which forms when a chlorised film of gelatine is immersed in a weak solution of silver nitrate, and prevents the penetration of the silver solution into the film. He argues from this that, when using the cupric bromide intensifier, a strong solution of silver nitrate should be used for blackening, and that gelatino-chloride prints should be well washed before toning in a sulphocyanide bath, or a surface precipitate of silver sulphocyanide may be formed, which may cause unequal toning by preventing the access of the solution to the deeper-lying particles of the image.

Stereoscopic Radiographs. — According to Professor Schiffner, it is possible, from stereoscopic radiographs, to tell not only the exact position of an opaque object as well as the distance from the top or bottom of the box in which it may be. The object has merely to be taken or radiographed from two points, and, if the object is lying on the bottom of the box, it will appear in the same position on each plate; whereas, if it is not on the bottom, it will appear in different positions, and from the difference in the two positions and the distance of the tube can its position be calculated.

THE PHOTOGRAPHIC COPYRIGHT UNION: ITS POSITION AND PROSPECTS.

The praiseworthy attempt to bring the Photographic Copyright Union once more prominently to the notice of professional photographers through the medium of the Leeds Convention was defeated by circumstances, the time and the occasion, the Wednesday forenoon, just

anterior to the taking of the all-important group, not being the most favourable for the purpose. Our own interest in the progress of the Union, however, together with the strong claims to the support of professional photographers which that body undoubtedly possesses, has since induced us to take advantage of an opportunity of inquiring for ourselves into the present position of the Union, and of obtaining such other information concerning its progress and prospects as would be likely to prove instructive to members and non-members alike. The correspondence that reaches us week by week proves that a great deal of ignorance and misconception prevails with regard to the Union, which, it is very desirable, should be removed. We are indebted to Mr. Frank Bishop (the President of the Union), and to Mr. J. J. Elliott (the Vice-President and Founder of the Union), for kindly answering our inquiries, and thus enabling us to set forth the following details.

The Work of the Union.

Naturally, the first question that occurs to us has reference to the present position of the Union; and we obtain the satisfactory reply that it has a membership of several hundreds, a considerable and increasing reserve fund, and that the Union's influence in the protection of photographers' copyright is greatly extending. Nevertheless, it is felt that there is scope for a membership of, at least, 2000 or 3000, and that it is only the ignorance of photographers as to the aims and objects of the Union that impedes its progress. The Union acts as a species of advising Society for them in copyright matters, the extensive experience of the Committee and of the Solicitors (who are expert in copyright law) being utilised for this purpose. Moreover, the Union registers members' photographs, and supplies the forms (which we reproduced in the JOURNAL of January 10 last), giving authorisation for the reproduction of photographs to newspapers The usual method for the transaction of business is by addressing the Secretary, Mr. H. Gower, Photographic Section of the London Chamber of Commerce, Botolph House, Eastcheap, who answers inquiries. In important or complicated cases the Committee are consulted, and in cases where redress is to be had by legal means the Solicitors act. From the commonplace book of the Committee (which meets monthly) we learned that quite recently advice had been sought by photographers in India, Africa, Ireland, Scotland, London, and the country, the majority coming from the country and abroad. It may be said that the main work of the Union consists in obtaining redress for the piracy of, and compensation for the use of, copyright photographs, but we were informed that it unfortunately often happens that members, instead of putting the matter at once into the hands of the Copyright Union, enter into direct communication with the offending paper, thus jeopardising their own interests.

The Executive of the Union has, so far, every reason to be satisfied with what it has accomplished, but is justly entitled to look for a far larger membership.

The Obstacles to Progress.

The obvious question as to why, with a total of between 4000 and 5000 professional photographers in the United Kingdom, the Union does not number its members by thousands instead of hundreds, elicits the statement that photographers generally do not know that there is no fee for membership. It cannot be too widely known that there is *no* subscription. The expenses of the Union are met by voluntary donations and a percentage on the amounts recovered, and it is intended that this plan shall be continued to be adopted for paying expenses, and it deserves to be urged, with all possible emphasis, that, by joining, members incur no financial liability whatever, either immediate or prospective. The only liability is in the obligation not to allow their copyright photographs to be reproduced for less than the minimum fee of 10*s.* 6*d.*

Again it seems that there is an impression that the obligation of being obliged to charge a minimum fee may react adversely to photographers' interests. Against this misconception we were cited numbers of cases in which members experiences were all to the contrary; indeed the effect of the minimum is being felt in the readiness with which a large section of the illustrated press now, as a matter of course, and without solicitation, tender fees. The Committee have every cause to be gratified for not having swerved from the minimum charge of 10*s.* 6*d.*, and they regard strict adherence thereto as the crucial point in the administration of the Union.

Furthermore, some photographers imagine that the Union works only for a few London photographers; as a matter of fact, we were assured, and are personally satisfied, that such is not the case—that provincial photographers receive a larger share of attention than their town brethren, who are probably better able to take care of themselves in copyright matters. But we regard the feeling that the Photographic Copyright Union exists solely for the benefit of a few photographers as unworthy of further notice; though it certainly must be regarded as an obstacle to its progress. There is also, we learn, a feeling with many photographers that they are in no danger of having their works copied or pirated, and that therefore the Union is of no service to them. Independently of the fact that our own recent experience of such matters accentuates the fallacy of such an attitude, Mr. Bishop and Mr. Elliott produced almost overwhelming testimony to the contrary. "The photographer never knows when he may want the services of the Union," we were told, and therein to our mind lies the best argument adducible in favour of every photographer joining it.

Some Minor Points.

Many photographers are still content to give the use of their photographs in return for the "privilege" of having their names printed under the reproduction; but this "advertisement" has, we were told, been shown to be practically valueless. The Union takes up the businesslike position that, whatever is worth having is worth paying for. As to what constitutes a copyright photograph much misconception exists. A photograph is copyright so soon as it is produced, but registration at Stationers' Hall is necessary to, as it were, make the copyright a legal integer. The photographer may register whenever he pleases, though he cannot avail himself of any statutory remedies until the photograph *is* registered; but, if a copyright picture is pirated *before* registration, he can subsequently register, when he is entitled to avail himself of all the statutory remedies against the reproducer for all copies sold *after* registration.

The administration of the Union itself is one in which all members may exercise a share or influence. It is governed according to rules; an annual meeting of the members is held, and the Committee and officers are elected by the members. We state this much in further refutation, if such were necessary, of the statement that the Photographic Copyright Union is run in the interests of a minority. It appeals to *all* photographers, and its administration is conducted on a broad and popular basis.

Apathy and ignorance have been obstacles not inferior in extent to the opposition of the illustrated press that the Union has so far had to fight; but it is pleasant to know that the press and the Union are working together in a feeling of harmony which is daily on the increase. The hard work of the past three years is bearing fruit, and it may be not unfairly claimed that the Union has, besides being of pecuniary service to many of its members, caused professional photography to be regarded with increased respect, and thus materially helped to raise its status.

The Future of the Union.

The future of the Union is in the hands of the professional photographers of the United Kingdom. To us it appears that it has earned the undying gratitude of the profession by giving to a copyright photograph, what it distinctly did not possess before, a market value. The efforts of the Union to compel users of copyright photographs to pay for them are perceptibly having a wide-spread effect, for payment is now made as a matter of course where once it was quite exceptional, if done at all. In return for these efforts, the Union asks for the moral support of all photographers, which can be best and most effectively given by taking up membership, and adhesion to the agreement not to charge less than the minimum fee of 10*s.* 6*d.* for the reproduction of their copyright photographs.

We conclude by recommending the Photographic Copyright Union to the hearty support of all our readers, who, or such as are not members, may obtain full particulars of membership from the Secretary, Mr. H. Gower, Photographic Copyright Union, London Chamber of Commerce, Botolph House, Eastcheap, E.C.

FIFTY YEARS OF PHOTOGRAPHY.

[Scientific American.]

In the entire range of invention and discovery nothing shows a more brilliant series of successes than the art of photography.

A hundred and fifty years ago, copies of writing had been made by the action of light on sensitive paper. Giambattista Porta had invented the camera obscura; and more recently Niépce and Daguerre, by different methods, had succeeded in making sun pictures; and Fox Talbot had invented the calotype or Talbotype; Herschel had given to the impression made from the object the name "negative," and to the print from the negative the name "positive."

Fifty years ago, in 1846, Schonbein discovered gun-cotton, and soon after collodion was produced by making a solution of gun-cotton in alcohol and ether. It was almost immediately adopted by Archer for a film in lieu of albumen and gelatine. Pictures produced on the sensitive film having collodion as the basis superseded the calotype and Daguerreotype, and were made almost exclusively after this discovery up to within fifteen or sixteen years. This film is still used by many photographers for special purposes, but more particularly in photo-engraving, and for transparencies and lantern slides. The collodion film was used for making negatives as well as positives; some of the best photographic pictures ever produced were made by means of wet-plate collodion-film negatives, albumenised paper being used in making the positive prints. Prior to the use of albumenised paper sensitised with the silver salts, glass positives, called ambrotypes, were introduced by making a very thin negative image and backing the plate with asphaltum varnish or black velvet, the black background producing a positive effect. In some cases they were bleached by means of a solution of mercuric chloride. Collodion positives are still made upon thin japanned iron, commonly called tintypes.

After a great many experiments, the modern dry plate was produced, not in its present state of perfection, but in a way which indicated its capabilities. The gelatine dry plate could not be made in perfection until after the gelatine itself had been improved so as to render it suitable for this purpose. It is to the perfection of the extremely sensitive dry plate that the great popularity of photography is to be attributed. Barring the bicycle, probably no craze was ever so widespread as that of modern photography. Methods of manipulation and improvements in lenses and apparatus have kept pace with improvements in the art itself, and the large demand for apparatus and material effected a corresponding reduction in prices. Lenses have been devised for every use, and the very recent improvements in optical glass have rendered it possible to produce lenses which are marvels of perfection.

It is needless to mention the improvement in cameras and portable apparatus, for we think it would be almost a rarity to find a family of which some member is not practically interested in photography. A great impetus was given to modern photography by the invention of the hand camera and more particularly that of the magazine hand camera. Magazine cameras in great variety have been brought out. Most of them have been fitted for the use of roll films or cut films, but a small proportion are arranged for receiving glass plates. Such cameras have been made as large as 8 × 10. The beautiful modern folding camera, being very light and portable, has become a great favourite with both professionals and amateurs. It is even more portable than the magazine camera.

From the ordinary side window as a source of illumination, the Daguerreotypist turned to the skylight, and special skylights, some of them of large size, were constructed and used to great advantage in the production of pictures which have never been surpassed in soft, delicate shading.

After the invention of highly sensitive plates it was possible to make a good picture with a smaller skylight, also with a good side light, when suitable screens were provided. With sensitive plates came the use of artificial lighting and flashlights for instantaneous work in the night, and in caves and dark places.

Since the development of the electric light many photographic establishments have been fitted out with electric-lighting apparatus, permitting of taking portraits at night and in cloudy weather. An additional advantage in the use of artificial light is that of carrying on the work on the first floor, thus saving stair-climbing or travelling in the elevator. With proper management the amateur photographer may procure flashlight pictures at home in the evening which compare favourably with daylight work.

Early in the history of photography it was noticed that true colour values were not rendered in any photographic pictures. Yellow, red, and green always appeared darker in the picture than in the object, while blue and violet appeared lighter. To correct this defect in photographic pictures, the plates were made colour-sensitive by colouring them with applied dyes, or by incorporating the dyes with the emulsion used in coating the plate. The difference between pictures taken with orthochromatic plates and those taken on ordinary plates is very noticeable. Coloured screens have been used in connexion with ordinary rapid plates for securing similar results, and in copying paintings, tapestries, and other works of art depending upon colour value for effect. Both the yellow screen and the orthochromatic plates have been applied simultaneously.

Very early in the history of photography, in fact before Daguerre's discovery, the workers in this line conceived the idea of making pictures in the colours of nature, or as they are shown on the ground glass or screen of the camera obscura. Fugitive coloured pictures were made, which could be examined by weak light, but they were quickly destroyed when exposed to strong light. No means were ever found for fixing these coloured images. Experiments looking forward to the discovery of some means of fixing and preserving the images have been carried on without much success since the days of Daguerre.

Tricolour photography is not a strictly modern invention, but it has been perfected to a great extent within ten years, and very pleasing pictures can be produced by this process, although they do not present the ideal coloured picture. Such pictures are produced by using three separate plates, and taking the pictures through three separate colour screens—red, green, and blue. A positive made from a negative taken through a red screen is transparent through all places where pure red is seen in the subject represented, also more or less in parts representing purple or violet and orange. A positive taken through the green screen will be transparent in the parts that are green in the subject. It will be transparent also in the parts representing yellow. In a similar way a picture taken through a blue screen is transparent to the parts representing the blue portions of the subject.

According to one method, the prints from the negative are made upon sensitised gelatine, the gelatine carrying the colour which is required to build up the portion of the picture demanding that colour. When these three prints are made and superposed, they reproduce approximately the colours of the scenes represented.

A modification of this method, which results in truer colours, is accomplished by making three positive black-and-white prints representing the three colours, and projecting them on a screen, where they are superposed, suitable coloured screens being placed in front of each positive. Some very beautiful effects are produced by this method.

Lippmann, of Paris, not long since discovered a very simple and interesting method of producing photographs in colour. He first produces a suitable negative, prints a positive from the negative, and backs up the positive with a film of mercury. The image is seen by reflected light, and the colours are produced by interference of light in a manner similar to Newton's rings. [This description of Lippmann's process is not *quite* accurate.—Eds. B. J. P.]

Among other developments in photography within very recent years may be mentioned several methods of reproducing photographic pictures in black-and-white, and other tints by lithography, photogravure, collotype, half-tone, and line etching. The collotype is a simple style of photographic reproduction. In making the collotype, the glass which is to support the film is finely ground, and a solution of albumen and silicate of soda and water poured over it to form a foundation for the film. Upon this foundation is poured a solution of ammonium bichromate and gelatine in water. When the plate is dry it is exposed to the light through a negative and immersed for a time in cool water, after which it is dried in a bath of glycerine and water, and coated with printing ink. The plate is then printed according to the method of the lithographic printer.

In photogravure the shadows are depressed in the plate, and the printing is done on practically the same principle as that of steel or copperplate printing.

In making a photogravure, a transparency or positive is taken from a negative by any of the well-known methods, and a copper plate larger than the print to be made is cleaned and dried, and then coated with a solution of gelatine and potassium bichromate in water. The plate is then dried, placed in a printing frame, and exposed through the transparency or positive, after which the surface of the film is dusted, etched, and cleaned, when the plate is printed from, after inking and wiping off, either in the same manner as a copper or steel-plate engraving, or as an etching, leaving a thin film of colour in different positions on the high lights to modify the effects.

In the half-tone process the sensitive plate is exposed in the camera through a grating, which leaves a texture on the negative, which, when printed through on the bichromatised metallic plate, produces lines or dots, which are etched, and which, in printing, leave high lights and carry the ink, which produces the shadows. When three plates are made through three coloured screens, and three impressions are produced from the plate with appropriate colours, very good pictures approximating the tints of nature are produced. This is now the most popular method of illustrating with colours. Recently, improvements in the shape of apertures in the screen have been made.

With the improvements in photography, the projection lantern has been rendered very efficient, so that either coloured or black-and-white pictures may now be projected upon a screen twenty-five feet square, producing very satisfactory results. In fact, some of the most popular entertainments of the day are on this order. With improvements in lenses, plates, and developers, the speed of photography has been increased to such an extent as to produce a distinct image in the space of $\frac{1}{1000}$ of a second. This renders it possible to catch images of insects, birds, and other animals, and even projectiles, in their successive positions. By reversing the process these images are reproduced in such rapid succession as to give the pictures all of the movements of life, without any apparent break in continuity. This is, in brief, the principle of the kinetoscope.

Photography has proved itself to be of incalculable value to other sciences. In surgery it has been employed for differentiating tissues. It has been employed for detecting stains inviable to the eye. It is a faithful recorder of physical phenomena, and has been made by Röntgen, in connexion with the X rays, to show interior portions of the body, and make other disclosures of a startling nature.

In addition to these, photography has been used for grasping celestial objects beyond the power of the eye and telescope, for mapping the heavens, measuring and recording spectra, showing the structure of the sun, revealing the extent of nebulæ, picturing comets, and making records of eclipses and other phenomena. It has also revealed things beyond the power of vision and the microscope.

McDONOUGH'S IMPROVEMENTS IN AND RELATING TO COLOUR PHOTOGRAPHY.

The nature of Mr. McDonough's improvements may possibly be gathered from his claims, which are as follows:—

1. A frame for holding or printing photographic pictures in colours, consisting of a receptacle for holding a negative or positive plate, a cover for holding a printing paper or material in contact with the plate, and means for moving the plate, or paper, or material, relatively to each other, to cause lines or patterns on their faces to register with each other.

2. A frame for holding or printing photographic pictures in colours, consisting of a receptacle for holding a negative or positive plate, a cover for holding a printing paper or material in contact with the plate provided with a surface of rough or tacking material next to and in contact with the paper or material, to prevent the same from shifting or expanding while printing, and means for moving the plate, or paper, or material, relatively to each other, to cause lines or patterns on their faces to register with each other.

3. A frame for holding or printing photographic pictures in colours, consisting of a receptacle for holding a negative or positive plate, a cover for holding a printing paper or material in contact with the plate, and springs and screws operating in opposition to each other for moving the plate, or paper, or material, relatively to each other, to cause lines or patterns on their faces to register with each other.

4. A frame for holding or printing photographic pictures in colours, consisting of a receptacle for holding a negative or positive plate and printing paper or material in contact, and provided with adjusting screws to effect the registration of the lines on the plate and paper.

5. A screen or plate for photographic purposes provided with coloured substances arranged according to regular recurring patterns—as dots, lines, figures—and having a portion where there is a fixed or invariable and distinctive characteristic which is reprodnced in the sensitive material applied to it, by which such material may thereafter be registered or adjusted in position in use.

6. A screen or plate for photographic purposes provided with coloured substances arranged according to regular recurring patterns—as dots, lines, figures—and having a portion or portions where one line or pattern is opaqued printed over.

7. A screen or plate for photographic purposes provided with coloured substances arranged according to regular recurring patterns—as dots, lines, figures—and having a portion where a line or pattern of one colour is opaqued and others of other colour or transparent and clear.

8. A screen or plate for photographic purposes provided with coloured substances arranged according to regular recurring patterns—as dots, lines, figures—and having a portion where a line or pattern is transparent and clear, and others of other colour opaqued.

9. A screen or plate for photographic purposes provided with coloured substances arranged according to regular recurring patterns—as dots, lines, figures—and having a portion or portions where all lines are transparent and colourless.

10. A screen or plate for photographic purposes provided with coloured substances arranged according to regular recurring patterns—as dots, lines, figures—and having a portion or portions where all lines are spotted or opaqued.

11. A screen or plate for photographic purposes provided with coloured substances arranged according to regular recurring patterns—as dots, lines, figures—and having a portion or portions where one line or pattern is extended beyond the others.

12. A screen or plate for photographic purposes provided with coloured substances arranged according to regular recurring patterns—as dots, lines, figures—in combination with a screen for registering purposes, having transparent and opaque lines or patterns corresponding in register, size, and alteration with the lines or patterns of the multi coloured screen.

13. A negative or positive photographic plate made with recurring patterns—as dots, lines, figures—and having a portion where there is a fixed, and invariable, and distinctive characteristic, which is produced in the sensitive material of the plate, and by which the plate may thereafter be registered or adjusted in position in use.

14. A negative or positive photographic plate made with recurring patterns—as dots, lines, figures—produced by the action of different coloured light in regular alternating order, having a portion of its surface printed and developed for the purpose of registering by means of and with a transparent line or pattern in each series of lines or patterns.

15. A negative or positive photographic plate made with recurring patterns—as dots, lines, figures—produced by the action of different coloured light in regular alternating order, having a portion of its surface printed and developed for the purpose of registering by means of and with an opaque line or pattern in each series of lines or patterns.

16. A negative or positive photographic plate made with recurring patterns—as dots, lines, figures—produced by the action of different coloured light in regular alternating order, having a portion of its surface printed and developed for the purpose of registering by means of and with an opaque spot covering all lines and patterns in that spot.

17. A negative or positive photographic plate made with recurring patterns—as dots, lines, figures—produced by the action of different coloured light in regular alternating order, having a portion of its surface printed and developed for the purpose of registering by means of and with a transparent spot covering all patterns in that spot.

IRVING'S IMPROVEMENTS IN OR RELATING TO PHOTOGRAPHIC CAMERAS.

Mr. J. B. Irving, the patentee, thus summarises his improvements:—

The camera is made square, with double-extension swing-back rising-front reversing arrangement, and is fitted with a shutter, which shutter can be fitted behind the front of the camera and inside the bellows. The kind of shutter I prefer is hereafter described. The bellows are attached to the sides of the frame, instead of two wings at right angles, as usual, that the folds may not cut off the light from the edges of the plate, the back folds of the bellows are larger than the front folds, and are made more pliable, so as to open fully before the others begin to unfold. The dark slides are made square, and are so arranged that they can be put in the camera to replace the ordinary reversing back, and can be used either vertically or horizontally. The front of the camera may be supported on the baseboard (which baseboard can have the usual rack-and-pinion movement) by a brass or other stirrup having slots, in which pins on the adjusting rack fit and hold the front of the camera in the right position. The front of the camera has also the usual rising-front arrangement. The back of the camera is formed so as to swing backwards or forwards by means of a strut of sheet metal fastened at one end to the baseboard, and bent at right angles in a plane nearly perpendicular to the side of the strut, thence again perpendicular at right angles to this plane, and supplied with a long slot having a sudden hook bend and a second slot. A screw pin in the frame works in this slot, and there can be several hooks in the slot, and thus several different points at which it comes to a full steady stop. By, however, allowing the pin to round the projection, it can run into the next slot, and thus the swing back opens still further. As the pin arrives at the end of the slot, it is held from going further by the projection. The lens has the usual iris diaphragm attached to it, but, instead of having the setting lever which actuates the diaphragm project through the side of the casing, I place it within the hood of the lens mount at the front, as by this means the lens may be more deeply or entirely sunk within the camera, and the lever is easier of access.

I also arrange at the back of the camera a focussing screen, which may be made of any suitable material, such as celluloid or the like; but, as the screen is liable to bend if made of pliable material, I place a light frame, fitted with vertical and horizontal bars, against the screen, and which forms a kind of grating. These bars serve to keep the centre of the screen straight, and also can be used instead of the vertical and horizontal lines, which are usually ruled on focussing screens.

A TRIP TO NORTHERN ITALY.

I took a trip to Venice two years ago, but it was a very short one; so, like Oliver Twist, I wanted some more of it. This year I was able to manage another visit, breaking the journey at Milan and Verona.

Except the celebrated Cathedral, there is not much in Milan in the way of architecture, which is the line I mostly work at; but at Verona there is an abundance of subjects—the Arena (a Roman amphitheatre), several churches, Arche degli Scaligeri, Piazza Erbe, and the curious water mills on the Adige. These last are unlike anything I ever saw elsewhere; they consist of three large flat-bottomed barges, two of which are fastened close together, and the third fastened to the other two by large beams, but about its own width away from them. A water wheel works in the space between, the mill being on a couple of barges. The whole affair is moored out in the stream, and connected by a gangway with the shore.

With the exception of S. Marco and I Gesuiti, the interiors of the churches in Venice are not very good subjects for photographing, St. M. della Salute in particular, picturesque as it is outside, being too short (it is polygonal) and also very lofty, so that no part of the dome can be got in. I Gesuiti, as it is always called—I forget its real name—is, like the other churches of this Order, remarkable for good work and lavish ornamentation. It is lined with white marble and inlaid, but the general effect is not very pleasing. I Frari has a very handsome exterior, which is the more remarkable from its being almost entirely built of red brick.

Many of the oldest churches in Venice have been closed as such, and sold, being used as stores; S. Gregorio is one of them, and is now a Government wine store; the abbazia of it is picturesque, but somewhat spoilt by a quantity of stone rubbish being deposited in the middle of the court.

Most foreign churches are to some extent picture galleries. I am not an artist, and do not know what pictures are good and what are not, but I know what I do and what I do not like. The good pictures are freely mentioned and praised in the guide books, but there are some which are peculiar, and which are only mentioned—neither praised nor described, *i.e.*, a *Last Supper*, by Cesare da Conegliano, in S. Apostoli. There is an interesting bas relief in S. M. dei Miracoli, which "Baedeker" says

is a copy, with variations, of Leonardo da Vinci's *Last Supper*, but which, I have been told in Italy, is the original from which he got the idea.

I took the opportunity, whilst at Venice, of going down to Ravenna, one of the most interesting places in Italy. Here are churches, some of which were consecrated in the fifth and sixth centuries, and are still in good repair. The mosaics in some are wonderful, especially those in the Batistero and S. Apolinare Nuovo; but, owing to some of them being in domes (the two baptistries are practically nothing else), it is necessary to have some means of photographing vertically, either by using a prism or by pointing the camera upwards.

On the way to Ravenna I had to wait some hours at Ferrara, also an interesting old place, but in a different way; I was unable to take any pictures there, as a very wide-angle lens is necessary.

A "permisso" is usually necessary for photographing the interiors of churches in Italy, and, to enable others to avoid a considerable amount of trouble which I had to take, I will say how it ought to be obtained.

In Venice you have to buy a stamped paper, valued sixty centesimi, and on this the application has to be written. In my case an official wrote it — in Italian — for me, and I got the permesso the same evening without any further payment. The office (Ufficio Regionale per la Conservazione dei Monumenti del Veneto) is on the first floor of the ducal palace, diagonally opposite the Scala dei Gigante. For photographing at Ravenna application has to be made to the Ufficio Regionale per la Conservazione dei Monumenti di Antichità, Bologna. I made mine by a reply prepaid telegram, and got the permesso in this case also without having anything more to pay. One condition on which a permesso is granted is, that you have to send three prints from each negative to the office.

In Venice there are at least two places where plates and apparatus can be bought, and where a dark room can be hired, viz., C. Acerboni, Ponte Cavalletto, 96, and Antonio Trauner, Merceria, 724. The charge for using the dark room is, at either house, two lire an hour.

I went from London *viâ* Newhaven, with Cook's return ticket, available for forty-five days, the cost of which, second class, was 8*l.* 13*s.* 6*d.*, and which enabled me to break the journey wherever I chose in Italy.

It is advisable, when travelling by rail in Italy (1) not to have much luggage, as there is none carried free except what you take in the carriage with you; (2) to have really good portmanteaux and locks, as the guards have the reputation of opening luggage and helping themselves; (3) not to have large trunks; (4) to insure all your baggage.

J. E. Gubbins.

The Inquirer.

*** *In this column we shall, from time to time, print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* Journal *useful and instructive.*

Lens Query.—If "Non-mathematical Reader" will bear in mind that the size of the object and the size of the image bear the same relation to one another as the distance of the object and the focus of the lens, he will not have much difficulty in working out his calculations.—J. E. Clark.

Utilising Calomel.—W. H. E. writes: "I have a considerable quantity of calomel for which I have no use. Can I in any way adapt it for use in intensification by converting it into corrosive sublimate? I have added hydrochloric acid to a portion of it, but that appears to have no action. Can any of your chemical readers assist me?"

Unmounting Gelatine Prints.—J. W. H. says: "In reply to 'Albumen,' let him treat his prints in the same manner as for crystoleum painting. Squeegee the thoroughly soaked prints to glass, but without any adhesive, and proceed to remove the mount by scraping and rubbing until no particle of unevenness remains. Then reapply fresh mountant and transfer to scrap book."

Fixing Prints.—C. P. R. says: "Having read the report and discussion of Mr. Haddon's Convention paper, I should much like replies to the following queries:—To fix a batch of prints with a fifteen per cent. solution of hypo for fifteen minutes, what method do you advise for gauging the sufficiency of the solution requisite in order to have the necessary quantity for the work to be done? and what, supposing just sufficient solution had been used, should be the strength left after fixing? Whose hydrometer is most suitable for taking the specific gravity of the aqueous solutions used in general photography and would it be a reliable method to test with an hydrometer the strength of solutions before using?"

Washing of Prints, *re* the discussion upon Mr. Haddon's paper.—Alpha says: "Will Mr. Pringle kindly oblige by stating what in his opinion should be the strength of the fixing solution; the temperature of same; and the reasonable time required. Answers from able, experienced, and successful workers, detailing their *modus operandi*, are most valuable. Some recommend only two ounces hypo to twenty ounces water, made alkaline with ammonia; others, I see, four ounces hypo."

Non-coagulable Albumen.—E. Freeman asks: "Can you give me any information, or tell me where I can find it, of a peculiar form of albumen which possesses almost diametrically opposite properties to those of ordinary egg albumen? If I remember rightly, it is not coagulated by heat, and is soluble in alcohol. I have read a description of its properties somewhere in the Journal or Almanac, but how long since I am unable to say; but it is probably some years ago, for I cannot find the reference."—We cannot at the moment refer our correspondent to the number of the Journal containing the description, but it appeared, we believe, in leader form several years ago, and we will endeavour to find it.

Insensitive Collodion Emulsion.—"I have been told," writes Halifax, "that an unwashed collodion emulsion, containing free bromide, is insensitive to light, until the excess of bromide is removed by washing. If this be really the case, is it not possible to coat the plates in daylight, and wash only in the dark room? Also, if such be the case, there does not appear to be any need to take very special care of the bottle containing the emulsion. I see that Mr. E. Sanger Shepherd, in last issue, speaks of coating in a *good* light, so as to be able to freely examine for defects before washing the plates. This would appear to answer my question; but what *is* a 'good' light? Daylight?" It is an easy matter to try the experiment, but *cui bono?*

Unmounting Gelatine Prints. — J. S. writes in reply to "Albumen": "If 'Albumen' will attack the prints from the rear, he will, perhaps, have better success than from the front. Soak mounts and all in cold water until the different layers of the cardboard can be removed piecemeal, leaving only the front sheet of fine paper that forms the surface in contact with the print. If every particle of rough cardboard and mountant be gently rubbed off with the ball of the finger without injuring the surface sheet, which is easily done if a little care be exercised, it will be needless to remove the latter, and it may be trimmed to the size of the print and remounted with it. Or it may be separated by carefully damping the back with a sponge and hot water until the gelatine is melted, the face of the print being laid smoothly in contact with a sheet of wet glass."

Lens Query.—In reply to "Non-mathematical Reader," I think he has not completely stated the conditions of his first problem. Distance and *size* of object and focus of lens being known, it is easy to arrive with sufficient approximation for all practical purposes at the size of image. Let D be the distance and S the size of object, f the focus of lens, and s the size of image. It is then a simple rule-of-three sum—:: D : f :: S : s. For absolute correctness, f would represent the actual conjugate and not the principal focus, so that, except for objects at some distance, the error arising from variations in the camera extension would be considerable. For the second problem the formula would be—s : S :: f : D, the same remarks applying. The results obtained are sufficiently accurate for use in the portrait studio, taking the principal focus as f, but for copying it would be necessary to go into further calculations to find the true f.—Forest Hill.

Transparent Carbon Tissue.—Carbo says anent some recent discussion on carbon printing without transfer: "Now that celluloid and other transparent mediums are so easily obtainable in extremely thin sheets of considerable strength, I wonder that some of the makers of carbon tissue do not utilise these substances in place of paper as the support at once 'temporary' and 'permanent.' The printing could then be done through the support which, if thin enough, would not interfere with sharpness, and the development would proceed in the ordinary way, just as the development of a film negative, the result being finally squeegeed on to paper, glass, or opal, as desired, or, better still, direct on to a suitable carbdoard mount. As far as I can see, there need be no great difficulty in the way of carrying out the idea; but, of course, there would be a difference in cost, which would be more than compensated for-

by the saving of trouble in use." Swan's original patent was for a tissue on this principle, namely, bichromated gelatine spread upon collodionised glass, and stripped after drying. The extreme thinness of the collodion film ensured perfect sharpness of the image, but, at the same time, necessitated the mounting of the tissue during development. It is questionable whether the colour and thickness of the modern film materials would permit of their use in this direction.

Our Editorial Table.

Jahrbuch für Photographie und Reproductionstechnik.

Wilhelm Knapp, Halle a/S.

The volume for 1896, edited by Dr. J. M. Eder, is a valuable addition to the photographic literature of the year. The high character of this annual is fully maintained, and the articles, written by many of the most competent authors of the day, record the progress of photography in all its branches since the compilation of the previous volume. We notice several very interesting and valuable papers on orthochromatic and colour photography, and many others on photo-mechanical and kindred subjects, by leading men in these branches. All recent improvements in lenses and apparatus are recorded and described, and there are many articles on printing papers, developers, and other subjects of special interest in ordinary photographic practice. Among the numerous contributors to the work we notice the names of A. Albert, J. J. Acworth, A. C. Angerer, Dr. Paul Czermak, C. H. Bothamley, G. Fritz, C. P. Goerz, E. von. Hoegh, Dr. J. Husnik, A. Lainer, R. Ed. Liesegang, Dr. P. Rudolph, A. and L. Lumière, L. Schrank, E. Valenta, Dr. Vogel, and E. J. Wall. A collection of prints at the end of the volume illustrates the present position of photo-mechanical work and colour printing.

Stamp-sized Photographs.

A. Seaman & Sons, Chesterfield, Ilkeston, and Matlock.

In the Journal of May 29 we described a printing frame, the invention of Mr. Seaman, for making stamp-size photographs direct from larger originals. By means of this frame, twelve photographs, each one inch by three-quarters of an inch, are printed from a small negative on a sheet of paper three inches square. The frame, as our readers will gather from the description (see page 347), is a very simple piece of apparatus, and should be found useful by those undertaking the production of these tiny photographs, which, as we have lately more than once taken occasion to remark, appear to be growing in popularity.

Of the quality of the results so produced, Messrs. Seaman have enabled us to judge by sending us an assortment of specimens, including some stamp-sized reproductions of our own portrait. Very pleasing little photographs are producible in this manner, and we are not at all surprised to learn that Messrs. Seaman find great demand for them. They appear to be executed on surface bromide paper, and are qualitatively all that could be wished for.

News and Notes.

The following are the awards in the last competition for amateurs' negatives on Gem plates:—1st prize, C. A. Morgan, Grange-road, Alloa, N.B.; 2nd, Miss H. Phillips, Woodland Park, Colwyn Bay; 3rd, Miss E. S. James, Hillside, Newton Abbot; 4th, F. W. Smith, 16, Parson's-green, Fulham, S.W.

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, the subject of discussion will be *The Relative Results of Different Developers in the Same Series of Exposures.* Visitors are welcomed by the members.

Gardens of Taste for Town Workers.—In connexion with the "One and All" Flower Show at the Great National Co-operative Festival this year, will be a unique exhibition of photographs and other illustrations of suburban and rural gardens and scenery. The competing views strikingly show what a wealth of floral adornment may be effected in a small space. Perhaps the capabilities of photography as a means of illustrating sylvan and garden scenes, and bringing out the nicest gradations of light and shade, have never been so well displayed as in some of the specimens which will be on view at this exhibition at the Crystal Palace on August 22.

An amusing and totally unrehearsed incident took place at Lord and Lady Salisbury's garden party to Li Chung Tong at Hatfield, on Saturday, which is worthy of being recorded. The ubiquitous photographer, without whom no *al fresco* function is complete, had arrived, and immediately pointed his camera "full on" at the distinguished Chinaman; but, just as the crucial moment arrived, and Lord Salisbury, and his guest were placed in position, the Prime Minister's pet boar-hound, indignant, possibly, at being excluded from the group, make its way to the front, convulsing every one by the vigour with which it wagged its enormous tail. The development of that picture will be looked forward to with interest, as it is doubtful whether even the timely application of the X rays could have reproduced the nether limbs of the noble Marquis and the Chinee, which the waving of the hound's tail so successfully hid from view.

The Solar Eclipse: Observations in Norway a Failure.—No results of any value were obtained of the solar eclipse, notwithstanding the extensive equipments of the Norwegian and Swedish parties. On a hill four hundred feet high to the north of Vadsö was Professor R. Copeland, Astronomer Royal for Scotland, with a forty-foot telescope. Close by was Dr. A. A. Common, F.R.S., President of the Royal Astronomical Society, with elaborate arrangements for photographing the corona and its spectrum. Lower down were more than fifty observers on an island opposite the town, and as far as was known, Professor J. Norman Lockyer (editor of *Nature*), with more than seventy observers, was at Braeshavn, on the opposite side of the fiord. A Russian party was located further east. All the observations, however, were rendered unsuccessful by a patch of cloud. The sun was seen for a few moments through clouds, but was quite obscured during totality. A dispatch from Bodö, Norway, received by the *Politiken*, states that the eclipse of the sun was well observed there, the sky being clear. A telegram from Bodö, received to-night, states that a photographer from Flensburg has taken eleven photographs of the eclipse at Bredvig on the Skjerstad Fjord, where it was clearly seen.

Big Photographs used as Wall Paper.—*Tit Bits* says: "A fashionable photographer of Regent-street has just communicated to us some really astounding facts concerning the growth of his profession. It seems that the latest development of taste in house decoration is the substitution of immense photographs for the ordinary ornamental frieze. This extraordinary fashion has its origin in a rather remarkable circumstance. One evening a large party of ladies and gentlemen, bound for a fancy dress ball, alighted at the establishment of our informant in Regent-street for the purpose of being photographed in costume. They arranged themselves in a more or less chaotic group, so that the photographer, who chances to be a painter by profession, was in despair, and ultimately asked his troublesome clients to march through the room and perform the graceful movements of the minuet. To photograph as many as sixteen people so engaged may sound impossible, and no, doubt, it would be so to the ordinary (*sic*) photographer. The great man in Regent-street, however, has discovered and patented a process whereby not only is the electric light applied to the purposes of photography, but all the rays are converged upon the sitter. Bringing his process to bear on the occasion alluded to, the artist succeeded in producing an admirable photograph of the whole party; it measured three feet in depth, and no less than sixteen feet in length. No sooner were copies of it reproduced than they were utilised forthwith as friezes for fashionable drawing-rooms, and in this way started a very unique mode. At the present time photographic wall papers have become quite an aristocratic craze, and it may, perhaps, be necessary to mention that our informant's clients are chiefly drawn from the very highest circles of society."

Ribbed Glass Windows.—Ribbed window glass is making its way very rapidly in America, and the reasons for its adoption are many and practical. With the old form of glass, both in fair and cloudy weather, the direction of the light entering the window is downward at an angle of about 40° or 50°. Thus the brightest portion of the room is the floor immediately in front of the window. The floor (says a contemporary) is not, as a rule, a very effective reflector, as a large amount of light is absorbed by it and lost. Early in the morning and towards the evening the angle of incidental light with the horizon is less; therefore the light penetrates through into the room, but the wall spaces between the windows get very little of it. If panes of ribbed glass are substituted for the plain glass, the bright spot in front of the floor disappears, and the entire walls and ceilings appear of the same brilliancy. The action of the ribbed glass is somewhat prismatic, the greater part of the light being reflected and spread out into a fan-shaped beam, which lies in a plane almost perpendicular to that of the glass and the direction of the ribs. It has been discovered that the effect of having the ribs horizontal is to give an increase of light in the middle of the room, and a decrease at the sides, whereas the vertical ribs give an increase at the sides and a decrease at the centre. The diffusion of heat is effected in the same way; there is no point where the heat rays stream directly in when ribbed glass is used, thus it is cooler than the plain glass by from 4° to 15° Fahr. The ribbed glass is itself hotter, however; thus the temperature of the air is much the same in both cases. Several large factories in America have been fitted up with this ribbed glass, and the effect is said to be in each case extraordinary. In cases where rooms were overlooked by other buildings the increase in light is really surprising. A large new establishment in Boston has been treated in this way, and the working people engaged there all speak with the utmost satisfaction of this new means of lighting.

Colour Photography: Mr. G. G. Bullmore's Challenge.—It will be remembered in our last issue Mr. Bullmore challenged us (on account of a friend) to produce within one month such photographs in colours as were described in the previous issue. Of course it will be plain to Mr. Bullmore that we are not in a position to produce such photographs without the permission of Mr. Wallace Bennetto. Now, this gentleman declines to give his consent on several grounds. Firstly, that he regards the whole letter as based on the implication that he does not speak the truth. This, he says, puts the matter entirely out of court as far as he is concerned. Secondly, that he is

not aware that it is usual to meet any inventor with what, in his opinion, is a common street bet. Thirdly, that he does not feel bound to consult anybody as to when or how he shall prove the validity of his discovery. He has stated he will hold a demonstration during the season, when he expects to satisfy even the Thomas-like friend of Mr. Bullmore. Now, we quite understand that those who have not seen the pictures are sceptical; we were ourselves. The description which we inserted was only a result of what we have seen. We do not pretend to be professionals, but we are most certainly of opinion that Mr. Bennetto's results are not obtained by any hand work. This opinion we find, without exception, held by those who have seen them, and, we may truthfully say, disbelieved by nearly all who have not! It does seem rather curious, it is always hard to believe that a person residing in one's native place has made a discovery. If he lived at Plymouth or London, doubts would possibly not arise. Mr. Bennetto declines to let us accept the challenge respecting the 20*l.*, but, if Mr. Bullmore will make the suggestion reciprocal respecting the rest of his offer, we will accept, *i.e.*, we will undertake that the photographs as described shall be produced on or before November 1 on condition that Mr. Bullmore will present a bound volume of the *Newquay Notes and Directory* to the British Museum, containing reference to the challenge by Mr. Bullmore or ourselves, and we will, if our promise is unfulfilled, present those numbers bound to the British Museum. We are quite willing to extend our offer so as to cover the Newquay Institute and Reading Room.—*Newquay Visitors' Notes.*

Recovery of Silver and Gold from Photographic Residues.—The *American Druggist* translates from the *Neueste Erfindungen und Erfahrungen* an original contribution by Weidert, as follows:—"Analysis of finished photographs shows that only a very small portion of the gold and silver used in their preparation remain in the finished print, by far the greater portion of the metals being retained in the baths. The methods of recovery of silver residues vary with their character. The silver from old fixing baths can be recovered in the simplest manner. By hanging strips of copper or zinc in the baths, the silver will be deposited on the strips in a greyish black powder or in small leaflets of a metallic lustre. This method, however, is tedious and extravagant, since a large portion of the silver remains in this solution. A somewhat better method is to agitate the bath after the addition of zinc dust, and then filter off the precipitate, wash, and then treat with diluted sulphuric or hydrochloric acid, in order to dissolve out the valueless zinc. This process, also, is not particularly to be commended. It is generally customary to precipitate the silver with an aqueous solution of potassium sulphide, and drain the brownish black sulphide of silver on a muslin filter and dry it. In order to reduce this to silver, it is fused with calcined soda in a porcelain or graphite crucible and poured upon an iron or marble slab. The sulphide of silver can also be roasted in the atmosphere, then mixed with three or four parts of potassium nitrate, and introduced carefully in small portions into a glowing crucible. In order to recover the silver from the paper clippings, &c., which have not been 'fixed,' the paper residue should be cut into small pieces and put for two hours into a bottle where the old fixing bath is kept. This bath is then filtered and treated as above directed. Since all photographic silver paper contains, in addition to the silver chloride, easily soluble silver nitrate, the first wash water from the toning in particular should be collected, and the silver precipitated by the addition of hydrochloric acid and sodium chloride. After drying, this should be reduced in the same manner as the silver sulphide, by the means of potassium or sodium nitrate. One may also pour over this precipitate a five per cent. solution of hydrochloric or sulphuric acid, and then hang in the solution a piece of zinc, whereupon the silver is thrown down in the metallic form. Gold is generally precipitated from the baths by addition of hydrochloric acid and a solution of ferrous sulphate. The gold is thrown down as a brownish red powder, which should be washed well and fused. Occasionally ammonium chloride is added in excess to the toning bath with some hydrochloric acid. The gold then precipitates out after a short time (if in a warm place and particularly in light) in the form of metallic glistening scales."

The Battle of the Baths.—I have already spoken of the advantages of the combined bath, but, like most other questions, it comes up again and again, and at the present time is being fought as hard as ever. Nor is it difficult to understand why it should be so. Although photography is essentially a chemical operation, photographers generally, professionals as well as amateurs, know little or nothing of chemistry, and unthinkingly, or rather thinking wrongly that the makers of sensitised paper know best what is best for their paper, employ for fixing and toning messy mixtures that fill the pores of the paper with the seeds of decay, that sooner or later must induce fading, and that neither hypo nor water will remove. In the too frequently recommended messes, including hypo, alum, gold, lead, &c., and especially when salts of silver are added by the immersion of prints in the solution, decompositions and recompositions occur to such an extent as to defy even an accomplished chemist to say what may be their ultimate composition, or what may or may not be left in the finished print, and therefore no photographer who has any respect for his character, or, if he be a professional, who wishes to retain his customers, should ever use them. To the professional photographer who tones and fixes a large number of prints daily, the question of convenience and other advantages of the combined bath are not very material; but to the amateur who prints only a few copies now and then they are very great. He may, for instance, make up enough to last him for a whole year; pour into a tray enough to well cover the few prints he wants to fix and tone, get any colour he desires, and then return it to the bottle to be ready for the next time; and that, provided the bath has been properly made, with the perfect certainty that his prints are in every way as good as if he had employed the separate solution method. "The battle of the baths," then, is simply the battle of the two sides of the shield. An improperly made combined bath—and almost all that are in present use are such—is an abomination, but one that is properly made is more convenient, more economical, gives equally permanent and equally beautiful results, and is in every respect better than any system of separate toning and fixing. I have experimented with almost every brand of printing-out paper that has been introduced, and say most emphatically that almost any desired tone from warm brown to a purplish black may, with suitable negatives and suitable printing, be reduced on any or all of them in a bath containing only sodium hyposulphite and gold. An exact formula is a matter of little importance, so long as there is sufficient of the one to fix and of the other to give the colours, the difference between weak and strong solutions being simply a question of time. The formula I generally employ has served me faithfully for over forty years, and is as follows: Sodium hyposulphite, 1 ounce; gold chloride, 1 grain: water, 8 ounces. Dissolve the hypo in six ounces of the water and the gold in the remaining two ounces. Neutralise the latter with sodium carbonate and add it to the former. The prints may be placed in the bath either with or without washing, but I almost always do the latter, and when the desired colour is reached, which may be in a few minutes, or in an hour or more, depending on the temperature and the colour desired, transferred to a solution of common salt, say, a handful to the gallon. The bath, as I have said, will keep indefinitely, but must be discarded as soon as the gold is exhausted, which will probably be after having toned a sheet and a half of paper; say, twenty-five cabinets for the darker tones, and half as many more in warmer colours. To those who may not have the convenience, or who do not care to take the trouble of weighing and measuring, the following formula will be acceptable, and give a combined bath sufficient to fix and tone prints equal to from four hundred to six hundred cabinets: Sodium hyposulphite, 1 pound; gold chloride, 15 grains; water, 1 gallon. Dissolve the pound of hypo as it comes from the stock house in the water, leaving out an ounce or two in which to dissolve the 15-grain bottle of gold, which, when neutralised by sodium carbonate, add to the hypo solution.—John Nicol, in *Outing.*

Patent News.

The following applications for Patents were made between July 29 and August 5, 1896:—

Cameras and Stands.—No. 16,544. "Improvements in Photographic Cameras and Tripods or Stands therefor. J. E. Thornton and E. Pickard.

Magic Lanterns.—No. 16,599. "Improvements in Magic Lanterns and Objects therefor." J. H. Pepper.

Lenses.—No. 16,602. "An Improved Protective Device for the Dispersing Lenses of Light Projectors." Communicated by Elektricitäts-Actiengesellschaft vormals Shuckert & Co. Complete specification. H. H. Lake.

Plate Forceps.—No. 16,866. "Photographic Plate Forceps." H. Parson.

Film-holder.—No. 16,868. "Photographic Film-holder." H. Parson.

Screen Kinetoscopy.—No. 17,049. "An Improved Apparatus for Taking Photographs in Quick Succession and Projecting them on a Screen." G. H. Harrison and T. J. Harrison.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
17	Bradford	*Printing and Toning.* F. Nicholson.
17	North Middlesex	*Elementary Composition.* F. L. Pither.
18	Birmingham Photo. Society	Excursion: Lilliesball Abbey, Shropshire. Leader, W. B. Osborn.
18	Brixton and Clapham	Ordinary Meeting.
18	Hackney	Address by the President.
18	Oldham	Excursion: Queen's Park Museum. Leader, J. Greaves, jun.
19	Borough Polytechnic	Open Evening.
19	Photographic Club	The Relative Results of Different Developers on the Same Series of Exposures.
22	Borough Polytechnic	Excursion: Otford, or Bromley and Orpington.
22	Croydon Microscopical	Conversational Meeting.
22	Hackney	Exc.: Dagenham. Leader, W. Hensler.
22	Leytonstone	Excursion: South Weald. Leader, G. U. Haslam.

PHOTOGRAPHIC CLUB.

August 5,—Mr. Crofton in the chair.

The Hon. Secretary read a letter from Mr. Cowan. He said that he was now beginning to get about with the aid of a crutch and stick, and that he hoped soon to be able to dispense with this assistance. He enclosed a letter from Mr. Montague Troup, a member of the Club, who had recently gone to Western Australia. The letter, which was of an interesting and chatty character, was read to the meeting by the Hon. Secretary, who was directed to thank Mr. Cowan for his kindness in forwarding it on. The Hon. Secretary then read a letter from Mr. Cole, of Barnet, calling the attention of the Club

to a statement (which was published in a report of the Club's proceedings) that a model of a rising and falling front, shown by Mr. Foxlee and presented to the Club by Mr. George Hare, was the same as Mr. Cole's invention.

The members of the Club present, including Mr. Foxlee, were unanimously of opinion that this was not so, and the Hon. Secretary was instructed to write to Mr. Cole to this effect.

A short discussion then took place upon the use of small cameras and the making of enlarged negatives.

Mr. CHARTERS WHITE asked the best method of enlarging from a quarter-plate negative which he produced. He said he had a four-and-a-half-inch condenser, and wanted to produce the best possible result, so that the editor of a paper could use it for reproduction purposes in his journal.

Some of the members examined the original negative and the enlargement already produced by Mr. White, and, having criticised them, offered suggestions.

MANCHESTER PHOTOGRAPHIC SOCIETY.

DESPITE the predictions of the morning's paper weather prophet, and the gloomy appearance of the weather, about twenty members with their friends assembled on the afternoon of the 8th inst. at London-road Station for the last outdoor meeting of the season. The destination was Bramhall, and the party alighted at Cheadle Hulme station and proceeded across the fields to Bramhall Hall, permission to photograph being kindly given by the owner, Mr. C. H. Nevill. The exterior unfortunately was only available, but, despite a few showers, cameras were soon at work on one of the best specimens of black-and-white in the district. The Hall stands on the top of a grassy mound sloping gradually to a rippling stream, which has been artifically made to form a small but artistic lake. The Hall was originally built about the time of King Edward IV., but Mr. Nevill has made many restorations, of which he is his own architect. After everything had been taken that could be taken, the party traversed a pretty woodland path to a farm, where good fare was provided for the workers and those who looked on. Leaving Bramhall Station about half-past seven, Manchester was reached at a quarter past eight, closing about the pleasantest season of outings the Society has ever held.

Borough Polytechnic Photographic Society.—On August Bank Holiday over forty members of the above Society (including many of the fair sex) visited the ancient historical city of St. Albans in the form of a picnic party; and, favoured with fine weather, a most enjoyable day was spent, both photographically and otherwise. Immediately upon arriving at St. Albans, soon after ten o'clock, the whole of the party visited the old Abbey Church, one of the finest buildings of the kind in the kingdom, consisting of a nave with western porches, aisles, transepts, choir with aisles, saints' chapel, eastern Lady Chapel, and a chantry chapel on its south side, with a central tower containing eight bells (of which the tenor weighs thirty cwt.) and a sanctus bell. The central parts are most ancient, and are built of Roman bricks from the ruins of Verulam. Despite the constant capping of the lens, in consequence of the numerous people passing backwards and forwards, and the many other difficulties one has to contend with in photographing interiors, some excellent results were obtained, and we were kept fully occupied until past the appointed hour for dinner, which was partaken of on the meadow of a local farmer, and full justice was done to the excellent and plentiful supply of provisions provided. After dinner a brake was chartered, which conveyed many of the party through some splendid scenery as far as Hatfield and back, frequent stoppings being made for those who took their cameras with them. The remainder of the party, who did not go for a drive, contented themselves with scouring the surrounding country in search of "bits." What is said to be the oldest inhabited house in the kingdom (and its appearance certainly goes to favour the statement), and known as the Fighting Cocks, was the object of several of our party. Tea was served in splendid style at six o'clock, after which most of the party, who had by this time exposed their last plate, indulged in some games, &c., whilst a second party were driven to Redbourn, thence to Harpenden, past Rothamsted Park, and back to St. Albans. Little was done in the way of photography, as the light for the most part was now very bad; given a good light, there is a heap of work for the amateur along this route. Upon the second brake-party returning, a concert was held on the meadow, which fittingly wound up what was unanimously voted "the most successful and enjoyable outing of the season." We are now preparing our winter session syllabus, and the Secretary will be glad to hear from any one who would be disposed to help us with a paper or demonstration on any subject on any Wednesday or Saturday evening. Communications should be addressed to 103, Borough-road, London, S.E.

North Middlesex Photographic Society.—August 10, Technical Meeting, Mr. F. W. Cox in the chair.—Mr. WALKER reported on the outing to Cambridge on Bank Holiday. He said eight members attended and spent a very enjoyable day. They photographed in several of the colleges, and were kept interested by Mr. Pither by his descriptions of the architecture, &c. Messrs. Cox, Mattocks, and Taylor brought up some results they had obtained on Venus paper, on which a demonstration had been given by Mr. Milne at a previous meeting, and the prints were much admired. Mr. Cox said a member had told him of a dodge for obviating silver stains on an unvarnished negative, which consisted of using a sheet of *papier minéral* between the negative and print. He found no loss of definition resulted. Mr. MACINTOSH described Wellington's stripping film, and passed round a negative he had stripped. He also said a good way to clean off the emulsion from spoiled negatives was to immerse one in a solution of potassium bicarbonate, and transfer to one of weak acid. Carbonic acid gas was given off in the film, and that loosened it, and it came easily away. He also exhibited a Krogener's book camera. In the competition for the prints taken at London Colney, Mr. Smith was placed first and Mr. Lisett second.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

To the EDITORS.

GENTLEMEN,—I take exception to a portion of your paragraph *re* the N.A.P.P. You say: "Of business tending to advance the profession, or even of individual members thereof, the Association appears to have done none at all."

Now, I could give you the names of large dealers who, up to the time of the Association, did business extensively outside the profession, who now deal solely with photographers. I enclose you a letter just received, not for publication, which is a case in point.

As to benefiting individual photographers, I may say my correspondence alone has been very considerable, and I fancy, beneficial; any how, repeated letters of thanks to me ought to be a proof of benefits received—please understand I should not have been brought into communication with my correspondents but for the N.A.P.P.

United action among the profession scattered so wide apart is difficult, as the dealers soon found, when they attempted a similar association and failed.

No, the Association may not have come up to expectations—but it has done much good in the past, and this in spite of the indifference of the members of the profession generally.—I am, yours, &c.

9, *Baker-street.* THOS. FALL.

EFFECT OF THE X RAYS ON THE SKIN.

To the EDITORS.

SIR,—Mr. Dunmore will do a distinct service if he investigates further the subject of his short note.

Of course, the deleterious effect on the skin of certain developers and solutions is well known, though not thought so much of as it might be. In the anxiety to get results with the New Photography one is apt to neglect precautions which otherwise would be taken; at least, that is my experience. But the least relapse to a condition of eczematous trouble, analogous to that described by Mr. Dunmore, and which is practically identical with the effects produced by the unguarded use of certain developers, will be a very sufficient warning.

With regard to *X rays*, is any one yet capable of giving an authoritative opinion? Certainly we see conflicting statements. If they exert a harmful effect on the fingers, why not upon the eyes or nose? In my own work, so far, I find the hands and fingers least exposed to the rays. In the first place, they are usually encased in a pair of rubber gloves; secondly, as the current is not switched on until the subject is arranged in position—the usual practice, I imagine—they are practically out of range during the whole of the exposure.

If the gentleman referred to by Mr. Dunmore has at any time during the past month exposed his digits *but once or twice* to the action of one or other of the strongly alkaline developers so popular (and useful) at the present time, I have no doubt that is the cause of his trouble.—I am, yours, &c., J. PIKE.

Nottingham, August 7, 1896.

MOUNTING UNALUMED PRINTS.

To the EDITORS.

GENTLEMEN,—I see, by last week's edition of THE BRITISH JOURNAL OF PHOTOGRAPHY, that you mention in an article on "Prints," that it is almost impossible to mount prints that have not been alumed. This is just the reverse of my experience, and, ever since its commercial career, I have used it. I tone, fix, and wash in the usual way, except that I never use a *rotary washer*. I have up to the present time used some two hundred tubes of gelatine chloride paper with a shiny surface, and have never used an ounce of alum, or lost a print through the heat dissolving the films or by frilling. A scratched print is a *rara avis* with me, and so it would be with any one who takes care with the manipulation in the various stages of washing, &c. My prints are *trimmed when dry after toning and fixing, not when they have left the printing frame.* I mount them with a rubber roller, about two inches in diameter, and they never crack or peel. Of course, I may be wrong in going against so good an authority, but my experience certainly tells me different.—I am, yours, &c., LIONEL P. G. DUNCROFT TAYLOR.

Thames Bank House, Mortlake, August 7, 1896.

OPACITY OF PLATES.

To the EDITORS.

GENTLEMEN,—Mr. A. L. Henderson, in last week's JOURNAL, asks "Why is a gelatine plate more opaque when wet than dry?"

Though not presuming to give the real scientific reason (I know nothing of science and chemistry), I venture to suggest that it might be accounted, up to a certain degree, to the hygroscopic property of gelatine, which, according to Captain Abney, in cold water, swells up and absorbs from five to ten times its weight of water.

Hence the increase in opacity—due to the greater thickness of the film. The action of drying rids the gelatine of water, and makes the film thinner and more transparent. Whilst engaged in emulsion-making I have noticed sometimes a freshly coated plate, which seemed to me thick and greasy, come out of the drying cupboard considerably reduced in opacity.

To ascertain if my surmise is correct, I should coat a plate with gelatine containing some colouring matter, such as Payne's grey, Chinese ink or sepia, and, after drying, compare it with another plate wet.
—I am, yours, &c., ALBERTO GARIBALDI WHITE.

Villa Valentino, Isola di Capri, Golfo di Napoli, Italy, August 5, 1896.

ART *VERSUS* MECHANICAL PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Seeing a letter in your JOURNAL, by Matthew Surface, entitled "Art *versus* Photography," asking what all these cameras and processes lead to, may I make a few remarks? Is it not to bring the beautiful into the homes of our fellow man? and then comes the question, What is the beautiful? and how are we to make our works a thing of beauty? Well, for some few weeks, I have been writing a pamphlet on "What is Beauty?" illustrated, but I have not yet got it in print, but when printed I should be glad to send it to any photographer desirous of having it.

It seems to me that photographers of the future should make it their business to be artists, if they wish to succeed as photographers. Well, how is it to be done? In my early years I was exceptionally favoured in having the means and time to study, both at the South Kensington Art Schools, gaining many prizes there, also seven years student of the Royal Academy of Arts, and practising, with success, photography; and the result of art training is that it teaches us to see

> "There's a beauty all around our paths,
> If but our watchful eyes
> Can trace it 'midst familiar things,
> And through their lowly guise."

I should be pleased, later on, if desired, to give a lecture and demonstration to photographers, free, if it could be arranged by appointment perhaps, at my own address—a certain number at a time—and point out what, to an untrained eye, would pass unobserved and lost to the unlearned.

> "'Twas in that glance that God threw o'er
> The young created earth,
> When he pronounced it 'very good,'
> The beautiful had birth."

I am, yours, &c., JOHN BOOL.

86, *Warwick-street, Belgravia, S.W., August* 5, 1896.

RE POISONS ACT.

To the EDITORS.

GENTLEMEN,—In your Answers to Correspondents column of last week I met with a most remarkable statement under the above heading.

After pointing out to a provincial photographic dealer that it would be illegal for him to sell solutions of bichloride of mercury or cyanide of potassium, you go aside to make an unworthy attack on the Pharmaceutical Society, and make statements which it would be only merciful to stigmatise as ignorance were it not for their obviously spiteful nature.

It is untrue to assert that the Pharmaceutical Society is a trades union. It has none of the attributes of a trades union. It has certain well-defined duties placed upon it by the State; and these duties are, primarily, to protect the public, not to secure the pecuniary benefit of its members.

The penalty, forsooth! It may be news to you to know that the Pharmaceutical Society is compelled by the nature of its Charter to prosecute for all infringements of the Poisons Act, and that these prosecutions annually result in a money loss to the Society.

Your last statement is enough to make a horse laugh. To assert that members of the Pharmaceutical Society, as a rule, know nothing of the uses or properties of cyanide of potassium and bichloride of mercury is so monstrously false that I am surprised you should thus seek to impose on the credulity of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY, and it assumes great gullibility on the part of your subscribers when such statements are made.

I defy you to produce any facts that will support your statement that any member of the Pharmaceutical Society has been guilty of such gross ignorance as imputed in your columns.

Trusting you will reconsider your perfectly unjustifiable remarks,—I am, yours, &c., WILLIAM HAMPSON, *Pharmaceutical Chemist, Member of the Pharmaceutical Society.*

Leigh, Lancashire, August 3, 1896.

[With regard to the concluding paragraphs of our correspondent's letter, the ignorance imputed was, of course, as to the photographic properties of the poisons named. Were it worth while, we might adduce many amusing instances of pharmaceutical chemists' mistaken ideas as to the uses of photographic chemicals. In reference to the other portions of our correspondent's letter, we see no reason to deviate from opinions frequently given in these pages, and even so lately as last week (p. 500).—EDS.]

THE EXPANSION OF PAPER.

[Autotype Notes.]

EXPERIMENTS, detailed in THE BRITISH JOURNAL OF PHOTOGRAPHY a few years ago, showed that the normal expansion of Rives paper was, in the direction of the web, but the eighth of an inch in twenty-four inches; while that across it expanded more than half an inch. Now, taking the greatest expansion, it will be seen that, after all, it does not amount to much, only about one in forty-eight. That being the case, it is very unlikely that any marked difference would be noticed in, say, the features of a couple of cabinet portraits if they were made on paper cut the two directions from the sheet, though it is manifest that they are different. There is often, however, a much greater difference in some prints than can well be accounted for by the normal expansion of the paper, and the object of this article is to point out the cause.

Paper, when thoroughly soaked with water, can be stretched very considerably, and it is to stretching in the mounting that considerable distortion and dissimilarity—when it exists—in prints is generally due. Quoting from the experiments just referred to, we find that twenty-four inch strips cut longitudinally of the web when mounted wet on stout cardboard (with stretching) measured twenty-four and a half inches when dry. Those cut the reverse way, and similarly dealt with, measured twenty-five and three-quarter inches, or an extension of an inch and three-quarters. That was with plain Rives paper, but on the experiments being repeated with albumenised paper the distension was still greater, namely two inches in the twenty-four, or just one-twelfth. Now, it will be seen that there would be a palpable difference, supposing two prints were made from the same negatives, the one on paper cut along the web and mounted without stretching, and the other cut across it and stretched to its maximum in the mounting. The one would be a twelfth longer than the other, equivalent to a quarter of an inch in a three-inch head.

It is not at all an uncommon thing with some mounters, when a print is not evenly placed on the mount in the first instance, to gently strain it into position instead of taking it quite off the mount again. It will be seen that, in this way, the perpendiculars of a building may be rendered anything but straight, and also that the features in a portrait can be much distorted, particularly by diagonal stretching.

What takes place with ordinary papers also takes place with "parchment paper," and in greater degree even. It is this kind of paper which is used in a collotype process that has been demonstrated frequently before photographic societies during the last three or four years. As, in this method, the paper has to be strained very tightly to keep it flat in the apparatus for inking, it will be seen that collotypes made by this system may show a considerable degree of distortion, and also not be true to scale, unless allowance be made for the stretching in taking the negative.

The expansion of paper may, however, sometimes be turned to profitable account. It may be made the means of producing a more flattering portrait, say, for example, a round face may be lengthened by cutting the paper crosswise of the web, and gently stretching the print in the mounting; or a long and thin face may be similarly broadened. In copying designs to scale, it may sometimes be turned to account in the event of the negative not being strictly to the dimensions ordered, a trifle smaller, for example. If the print be mounted wet, it will be more or less larger than the negative, according to the way of the paper. If, on the other hand, it be mounted dry, and with a mountant that contains a large proportion of spirit in place of water, it will be practically the same size as the negative, supposing the paper be cut lengthwise.

E. W. FOXLEE.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Harry Lothian, 144 and 146, Freeman-street, Grimsby.—*Two photographs of August Bank Holiday at Cleethorpes.*

Peter Charleton, Garrison Studio, Newbridge, co. Kildare, Ireland.—*Photograph of drum horse, Jack, Royal Dragoons, with camp for background. Photograph of drum horse, Mick, 14th King's Hussars, with camp for background.*

G. B. Bradshaw, High Bank, Altrincham, Cheshire.—*Photograph of Rev. F. Wainwright, Vicar of St. John's Church, Altrincham (cabinet size). Photograph of Rev. F. Wainwright, Vicar of St. John's Church, Altrincham, and Mrs. Wainwright (cabinet size).*

RECEIVED.—C. L. Hett; thanks.

R. W. WILLMOTT.—Quite unable to publish your letter.

EXCHANGES.—L. R.; C. S. E.; F. M. G. We have abolished them.

PHOSPHORESCENT SULPHIDE OF CALCIUM.—PHOSPHO. The substance is supplied, we believe, by Horne, Cow Cross-street, E.C.

PHOTOPHIL.—1. If a silver print, treat it with a solution of bichloride of mercury, and then, to restore it, use sodium sulphite. 2. Scarcely worth while.

MIRROR.—PROCESS. Ordinary plate glass, however thick, will not do for a reversing mirror. The glass for the purpose must be optically worked, so as to secure a perfectly plane surface.

INK STAIN ON A PHOTOGRAPH.—HANNIBAL. This may be partially, if not entirely, removed by the application of hydrochloric acid. But you run some risk of damaging the photograph if a silver print.

COMPETITIONS.—HERBERT MITCHELL writes: "Will you kindly tell me if there are any photographic competitions taking place at any time in connexion with your paper?"—In reply: We do not hold competitions.

HALATION.—HALO asks if halation can be prevented by backing plates with collodion?—In reply: Of course not; but, if with the collodion any dark red or brown pigment is mixed, an effective remedy will have been devised.

LENS.—SYMMETRY. You are probably alluding (although it is merely a surmise on our part) to the Stigmatic lens. This is the invention of Mr. H. L. Aldis, and is manufactured by Messrs. Dallmeyer, Newman-street, W.

PHOTO-CHROMOSCOPIC CAMERAS.—ANXIOUS wishes to know if the cameras referred to by Mr. Ives and Mr. Edwards, in their correspondence in the JOURNAL some months ago, are yet on the market.—In reply: We are without tidings of such cameras.

COPYRIGHT IN MUSIC.—S. G. If there is a permit on the music that it may be sung in public without fee, that does not entitle any one to reproduce it as a lantern slide, to be thrown upon a screen, and used at evening entertainments in rural districts.

REPLYING TO CORRESPONDENCE.—W. R. We do not undertake to reply to letters through the post. This also answers several other correspondents who have neglected to peruse the directions printed at the head of our Answers to Correspondents column every week.

DEVELOPING CHLORIDE PRINTS.—A. C. COOKE. Prints on the paper named can be developed, after being partially printed; but, whether that method of proceedure is largely practised by professional photographers or not, we are scarcely in a position to say.

LIVER OF SULPHUR.—C. B. Sulphide of potassium, or, as it is often termed, "liver of sulphur," may be made by fusing together one part of sulphur and four parts of carbonate of potash. When cold, the mass must be broken up and kept in a wide-mouthed, corked bottle.

VARNISH.—H. MEYER. If you refer to the ALMANAC, you will find several formulæ for negative varnishes, all of which are good. We cannot, however, say if the commercial varnish mentioned is made by any one of them. English manufacturers, like those of your country, do not publish the formulæ by which they manufacture the materials they sell.

PATENT.—T. C. B. We can scarcely advise you in the matter of taking out a patent for your invention. The chief points for your consideration are: Is the invention new and original? Doubtless it is as regards yourself, but that is not sufficient to make a valid patent if the thing has been done, or substantially done, before. Also, if you are able to establish a valid patent, will you be able to turn it to commercial advantage? If you cannot, it will be quite useless to waste money in taking out a patent.

MOUNTING PRINTS IN OPTICAL CONTACT WITH GLASS.—J. R. S. wishes to know how this is done.—In reply: Apply a warm fifty-grain solution of gelatine to the face of the print, and immediately lay it face down on the glass; then apply a squeegee to ensure contact and freedom from air bubbles.

MAGIC PHOTOGRAPHS.—REV. T—— L—— asks what these are.—In reply: They are ordinary silver prints, fixed without being toned. They are well washed, and placed in a solution of mercuric chloride, which obliterates the picture. They are again washed, and, when it is desired to make the pictures visible again, a solution of sodium hyposulphite will do the needful.

ARTICLED PUPIL.—TRUSTEE. There are no fixed or recognised terms for "articled pupils" or apprentices in the photographic profession; so much depends upon the status of the firm, and what they are capable of teaching. We may, however, say that, if we were in your position, we certainly would not pay half the premium you mention to "article" your charge to the firm named, or, indeed, any sum whatever.

CHLORIDE PAPER.—E. HARRISON (Burton-on-Trent). The reason the sample of chloride paper enclosed is not so good as that you "buy at the shop" is that you have not prepared it in the same way as the commercial papers are. We should recommend you to purchase the paper ready for use, unless your consumption of it is such as to warrant you in laying down proper plant for preparing it as the commercial papers are prepared.

COPYRIGHT.—IGNORAMUS says: "Please will you answer the following questions? I have got a *carte-de-visite* to copy cabinet size, and it has printed 'copyright reserved' on the mount. The person was an ordinary sitter to the photographer who made the print. 1, Is it copyright? and, 2, Would I run any risk if I made the prints wanted? The print is a good age, is yellow, and slightly faded."—In reply: 1. Probably the photograph is copyright. 2. Most likely.

COPYRIGHT.—R. BIGGS. If the sitter came and sat to you in the ordinary course of business, your competitor cannot be restrained from making enlarged copies of the portrait and selling them. You have no copyright in the portrait, therefore what would be the use of registering it? The Office makes no inquiry as to the legality of the copyright when they accept the registration. If the one who registers it has no right to it, of course the registration gives him no legal right to it.

COPYING.—W. A. DEL MAR. It is impossible to answer such a question. How is it possible to say the exposure necessary to make a copy with no other data as to light than the "middle of August and stop *f*·32?" The only practical advice we can give is to make a trial negative at the time and thus judge for yourself. This can be done on a small plate on a portion of the subject, if the copy is to be of large size. A single experiment of this kind will teach more than anything we can say.

DEVELOPMENT.—S. COOPER. As the developer you have used is one that the makers of the plates say is not to be recommended for that class of work, we do not see how we can help you, except by telling you to employ those they say are best suited for the tones you desire. Makers know, or at least ought to know, the developers best suited to their plates to produce the various colours they are capable of yielding, and we should say that they had best be adhered to in ordinary practice.

SPOTTING.—A. VANDYKE. "Can you tell me of any method of spotting albumenised prints before enamelling so that the spotting does not come off in the process?"—If the prints are spotted with the ordinary oil colours, as sold in tubes, thinned with spirit of turpentine, the spotting will not be disturbed by the enamelling. Special colours are, however, sold for the purpose. They may be obtained from Mr. Rudowsky, Guildhall-chambers, E.C., and of most of the large dealers.

TONING.—H. MASON. Your second letter does not help at all. "Sensitised paper" does not tell us how the paper is salted and sensitised, and what proportion of chloride to silver it contains. If you cannot get the grey tones you desire with the acetate bath, try the lime toning bath or the carbonate of soda bath. Possibly the negatives you are using are such as will not give fine grey tones. As much depends upon the negatives, as regards tones in the prints, as upon the paper or the toning bath.

FIXING.—A WORTHING AMATEUR writes: "How many prints, 4¼×3¼, will three ounces of hyposulphite of soda fix? I fear I have been using much more than has been necessary, and thus adding to my photograph account?"—This is a difficult question to answer, because it entirely depends upon the chloride of silver in the prints that has to be removed, and every brand of paper, whether albumen, gelatine, or collodion, varies in the quantity of chloride it contains. Practical photographers, as a rule, do not stint the hypo, but use enough to ensure the perfect solution of the silver salts, because the hyposulphite of soda is so very cheap.

THE BERGHEIM-DALLMEYER LENS.—JOHN says: "I shall be obliged if you will inform me whether you consider a Bergheim-Dallmeyer soft-focus portrait lens suitable for amateur portrait photography. My camera (Optimus) is whole-plate (extension, sixteen inches). Should I purchase a lens of the ordinary size for whole-plate, or would it be better to have the next size larger? Also, is the Bergheim-Dallmeyer soft-focus lens a rapid one? I much like the soft effect it produces. I have a good studio."—In reply: 1. The lens is, we believe, suitable for the work. 2. The firm recommend their No. 2 for this size and upwards. 3. Not so rapid as the ordinary portrait lens, but quick enough, we think, for your requirements.

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EX CATHEDRÂ.

Mr. A. W. Rider, who has been associated with the Eastman Photographic Materials Company from its formation, eleven years ago, and has acted as Secretary since its conversion into a limited liability Company, informs us that his connexion with the Company has been severed. He proposes shortly engaging in the photographic business on his own account, and we are sure he will carry with him, in his venture, the good wishes of his friends in the photographic world.

* * *

The judgment of Mr. Justice Romer, in the case of Shew *versus* The Société des Lunetiers, which is given in another part of the Journal, establishes the validity of the patent for the well-known "Eclipse" camera, and the shutter working between the lenses. The patent for the camera was taken out in the year 1885—when there were few if any hand cameras on the market—so that it was not until over ten years afterwards that Messrs. Shew were compelled to defend their position. It says a great deal for the practical value of a hand camera that, after the lapse of so many years, during which innumerable new forms have been introduced, it should be worth risking a costly lawsuit in defence of the patent granted for it.

* * *

We hinted last week at some of the fiascos that have attended the comparatively frequent "invention" of photography in natural colours, and, as the subject is of constant interest, it may be useful if we allude to two or three processes that have been introduced in recent years, only to be either ridiculed out of existence or neglected as impracticable. It may be said, with reference to the main subject, that, so far, what is known as the three-colour system and the interferential method of Lippmann, both of which have been frequently described in our pages, are probably the only processes that have yielded results at all entitled to the designation of photography in natural colours, and that inspire any hope for the ultimate practicability of colour photography.

* * *

Shortly after the publication of Lippmann's process, in 1891, Dr. Kopp, of Lucerne, momentarily startled the world by claiming to have made the discovery of photography in natural colours. His process—which appears to have died with him (for the inventor went over to the majority shortly afterwards)—seems to have been a modification of one attributed to Poitevin. Briefly described, it consisted of exposing specially prepared silver chloride paper to diffused light, with the formation of silver subchloride. The paper was then immersed in a mixture of potassium bichromate, copper sulphate, and mercurous nitrate and zinc chloride. Exposure of such a paper was said to produce the yellow and green colours, the other colours being "veiled." However, by varnishing the green and yellow, the other colours could be developed with sulphuric acid, all the colours, "including white" (as Dr. Kopp averred), appearing in "all their brilliancy." We cite this process (of which the barest outline only has been given) as typical of many, based on early experiments, which resulted in comparatively small success, the main difficulty being to fix or retain the colours when obtained.

* * *

At the instance of a once well-known West-end photographer, whose invention the "process" was said to be, much stir was made in the non-photographic press and elsewhere, about nine years ago, over his alleged solution of the problem of taking photographs in the colours of nature. Upon examination the

results appeared to be simply albumen prints coloured with liquid pigments and varnished. It was also surmised that the process was really a modified crystoleum one, the pigments being applied behind a pellicular positive, and backed up by paper. The "discovery," as our readers will have imagined, came to nought. Some light was thrown on the nature of the inventor's views on the production of photographs in colours by his subsequent claim to have reproduced Daguerreotypes in natural colours by a process of applying the "colours of the vibrations" stored up in the originals for thirty years!

* * *

THE method of colouring photographs just described has formed the basis of many subsequent discoveries! of photography in natural colours, as a study of our patent intelligence even so recently as the last two or three years will show. Indeed, it was not for the want of effort that a company was not formed a comparatively short while ago, for the purpose of licensing out such a process! Lastly, it will probably be within the recollection of many of our readers that an analogous or so-called process of photography in natural colours figured in the criminal courts a few years ago, and that one of those who took a prominent part in the exploitation of the discovery received a term of imprisonment. Having regard to the fact that in about thirty years there has been discovered but *one* method of taking photographs in natural colours—Lippmann's—which has been verified by independent experimentalists (Messrs. Lumière, to wit), and that even this process does not appear to be within measurable distance of coming into use, we think we have said sufficient to justify an attitude of scepticism when any fresh announcement of the great discovery is made.

* * *

DURING Li Hung Chang's brief sojourn at Hawarden on Saturday afternoon, Mr. G. Watmough Webster, of Chester, was fortunate in being able to secure several admirable photographs of Li seated in company with Mr. Gladstone. Several interior and exterior views of the Castle and the assembled company were also obtained. The picture of the Chinese Envoy and Mr. Gladstone will appear in several of this week's illustrated papers. We may be permitted to cite, for the benefit of others, Mr. Webster's business alertness in disposing of the photographs, for the negatives were developed and retouched, gelatino-chloride prints struck with all dispatch, and the finished photographs personally submitted and disposed of to the editors of the illustrated press before noon on Monday last.

THE FIXING POWER OF HYPO.

THE recent investigations of Messrs. Haddon and Grundy on the subject of the fixing and washing of prints, and the discussion of the matter that arose on the latter gentleman's paper at the Convention, have deservedly brought this important question once more to the front. But, while recognising to the full the absolute necessity for perfect fixation and thorough washing, it seems to us there is a tendency in some directions, by ultra-carefulness, to nullify much of the benefit that is likely to accrue from giving the subject its due amount of attention.

A question answered in the Correspondence column of our last issue is only a type of a very large number that are constantly reaching us, as to the precise fixing value of hyposulphite of soda. "How many prints, $4\frac{1}{4} \times 3\frac{1}{4}$, will three ounces of hyposulphite of soda fix?" asks our correspondent, and adds, "I fear I have been using much more than is necessary, and thus adding to my photographic outlay." From other similar communications we judge that a large number of our readers are under the impression that, as Mr. Haddon's experiments show that we have been in the habit of submitting our prints to an unnecessarily long washing after fixing, so perhaps we may be overdoing the fixing operation itself. Hence a tendency to cut down expenses by economising hypo, and by attempting to reduce the fixing of prints to an exact process, like emulsion-making.

But we would point out that the success, or otherwise, of the fixing and washing process does not depend upon the chemical side of the question at all; that is simple and straightforward enough, and, if the reaction between the fixing agent and the silver salts were the only condition to be studied, there would be no such thing as fading. If, in fact, as some seem to imagine, it were simply a question of using so much hypo for so many prints, to ensure perfect fixation, all the difficulties that have surrounded silver printing from its earliest days would at once disappear. But such is not the case, for the difficulties, where they exist, come entirely from the mechanical side, and lie in the uniform and free application of the fixing agent to a mass of prints in such a manner that the necessary chemical changes shall be thoroughly and efficiently carried out; and, after that, in an equally thorough washing to remove the products of the reaction. There is no chemical difficulty, but simply a mechanical one; but, in proportion as we attempt to reduce the process to a strictly chemical one, so do we create chemical difficulties from the increasing inefficiency of the mechanical treatment.

Let us try and illustrate this. In the process of fixing, that is to say, in the course of the solution of the unreduced chloride of silver by the hypo, a chemical change goes on which results in the formation of a double salt—a hyposulphite of soda and silver—together with chloride of sodium. But, as is well known, there are two of these double hyposulphites, one of which is perfectly soluble, the other insoluble, or but partly soluble and easily decomposed. In the formation of the first-named, which is the ultimate object of *perfect* fixation, three parts of hypo combine with two parts of chloride of silver. Thus:—

$$3Na_2S_2O_3 + 2AgCl = Ag_2Na_43(S_2O_3) + 2NaCl$$

and the result is a perfectly soluble salt, which is easily washed out of the prints. But, when the quantity of hypo present is insufficient to form the completely soluble salt, the reaction is slightly different, and the two substances combine in equal proportions—

$$Na_2S_2O_3 + AgCl = AgNaS_2O_3 + NaCl$$

forming the insoluble double salt, which is the chief cause of fading.

Looking at the above formulæ, it is, of course, the easiest thing in the world to calculate exactly how much hypo is necessary to fix a given number of prints, if we possess the other necessary data to work upon. According to the figures given above, three ounces of hypo, supposing it to be *pure*, should dissolve a little over an ounce of chloride of silver. We say "supposing it to be pure," because the ordinary hypo of commerce, or, at least, as supplied to photographers, is certainly not an article above suspicion, and, if its impurities consist of nothing worse than water, its fixing value must b

materially lessened thereby. However, we have volumetrically tested a fairly good commercial sample, as supplied for photographic purposes; and as the mean of three estimations, all pretty close, the actual fixing value was less than one per cent. below the theoretical or calculated.

But of what practical value is this information when obtained? We may know the power of our fixing bath, and the quantity of silver chloride it is capable of dissolving; but how are we to arrive at the quantity to be dissolved? Even if the paper-makers gave us an exact analysis of the composition of these films, and a guarantee that they contained the quantity of AgCl stipulated, how are we to estimate what proportion of the original salt remains unreduced, and therefore subject to solution? The thing becomes an absurdity at once.

Even supposing this difficulty were removed, and it were possible to accurately adjust the proportion of hypo requisite to the formation of the soluble double salt, the use of a fixing solution containing just the theoretical quantity would be absolutely impracticable owing to the impossibility of evenly distributing and so as to act uniformly over the whole surface of the prints, and also because, as the solution became gradually exhausted, the last portions of the hypo would cease to have any power of action and the process would never be completed. In fact, the efficiency of the fixing operation depends wholly upon its being carried out in the presence of a considerable excess of hypo.

The necessity for this excess appears in another way. In fixing a large batch of prints it is practically impossible to keep them separate during the whole process, and the action of the hypo must consequently take place during the interval of turning them over. If a very weak solution be used, then all fixing action ceases as soon as the print is shut off by contact with another, and the chloride of silver consequently, unless the process is very prolonged, partially escapes conversion, or is only reduced to the form of the insoluble double salt. If a stronger solution, and plenty of it, be used, the excess of hypo confined between the prints keeps up the fixing action even whilst they are in contact, and so ensures perfect or complete reduction of the chloride.

Of course it might be possible, in operating upon a single print, or only a few, to successfully work with a quantity of hypo somewhat approaching the theoretical quantity, though we much doubt it. But it would be at the expense of a far greater amount of applied trouble and far longer time than would in any way compensate for the saving in hypo a hundred times over. Our fixing salt is cheap enough to permit of its generous use when the advantage of that course is so plain, and we think it will be agreed that any attempt at economy in the direction indicated by our correspondent of last week is in the highest degree foolish.

Besides, turning again to Mr. Haddon's paper, in order to derive the benefit of the short washing shown to be possible and effective, we must just have perfect fixation, that is to say, the thorough conversion of the chloride of silver into the soluble form. When this occurs, the double salt diffuses freely out of the gelatine film without any risk of decomposition; but, when the conversion is imperfect, or barely sufficient, and where there is not an excess of hypo present, some of the silver is pretty certain to be left behind in the insoluble condition—not as chloride, but as hyposulphite. The former would discolour by exposure to light; the latter does not, but gradually undergoes a change, in the course of which yellow sulphide of silver is formed which constitutes the so-called fading.

The imperfect fixation charged against the sulphocyanides, when introduced some years ago, arises from a different cause, namely, the precipitation of the chloride as either chloride or sulphocyanide on dilution of the solution. So far as we can ascertain, this never occurs in the case of hypo, as a solution of any given strength saturated with AgCl may be diluted without causing any precipitate.

Pure Ether.—This liquid, which, once upon a time, was the subject of poignant discussion as to its exact condition when pure, is now rarely referred to since the decline of collodion. Still, it will be interesting to learn, on the authority of Herr H. Thorns, that ether, even when most carefully purified, is not the neutrally reacting substance so often imagined, for it turns sensitive red litmus paper blue.

Röntgen Ray Investigations.—From practical and from theoretical standpoints investigations continue to be made to the continued elucidation of some aspects and the further confusing of others. With regard to the wave-length, Dr. Fomm, of Munich, has made a series of investigations which result in his evaluating them at about one-fifteenth the length of the smallest hitherto calculated wave in the ultra-violet.

Their Reflection and Transmission.—This has been investigated by M. F. V. Dwellshauvers Dery, and he finds no regular geometric reflection, though, from certain of his experiments, a diffuse reflection seemed to be indicated. He placed a plate face downwards, and half covered it with ruby paper, and sheets of brass, copper, tin, and collodion were placed under this, then followed a second plate, film upwards. It was found that the collodion increased the transmission, and that in practice exposure was diminished by covering the film with a sheet of collodion. The metals reflected in the following order: tin, zinc, copper, brass, iron, platinum, gold, lead, aluminium. The most important fact was the ruby paper intercepted a large proportion of the reflected rays, which, the writer pointed out, could not, in consequence, be Röntgen rays proper.

The Fluorescent Tablets.—Herr W. Aruold has been experimenting in various directions, and his experience was that tungstate of lime was the most luminous of all salts under the action of the rays—more marked, indeed, than the platino-cyanide of barium. Other writers obtain somewhat similar results, though it is evident that considerable variations in the fluorescent power are to be observed, according to the mode of manufacture. Messrs. Hopkins & Williams in this country, for example, supply a tungstate for Röntgen work at about four times the price of their ordinary tungstate.

Interesting Photographs.—A few weeks ago, it will be remembered, we mentioned that Li Hung Chang and that veteran statesman, Prince Bismark, were photographed together in a group at the latter's residence at Friedrichsruh. The group has since appeared in one or more of our illustrated papers. On Saturday last, as remarked elsewhere, Li paid a visit to Mr. Gladstone at Hawarden, and during the stay these two veteran statesmen were also photographed together, as a group, sitting side by side. No doubt, these two pictures will serve as a pleasing reminder of his European visit to the Celestial "lion" on his return home.

The Late Solar Eclipse.—After all the well-considered preparations made for it, and the flocking thither by scientists, *dilettanti* and otherwise, the Norway Eclipse Expeditions may be considered a failure in every way. Evidently the Norwegian clerk

of the weather was not propitious on the occasion, as he has not been, according to all accounts, the greater part of this season to tourists. The pleasure-seekers accompanying the expedition excursion did not, we are informed, derive all the enjoyment they anticipated from the trip on account of the weather. It is easy to be wise after the event, and some are now saying that the locality chosen for the observations was ill-advised. Anyhow, the weather does not seem to be much better anywhere else where observers went. A recent Japanese telegram says that the eclipse was clearly seen at Tokio and at Yokohama; but, in the north, where the astronomers had gone, the weather was wet and cloudy all the time, so that no observations, photographic or otherwise, could be made.

Sir John Millais.—Within the space of a few months the Royal Academy has lost its President for the second time by the death of Sir John Millais, who passed away on Thursday, last week, at the age of sixty-seven. Sir John, we are told, was by no means anti-photographic, and often used photographs to help him in his work, particularly in the case of portraiture. This may in some measure be due to the pronounced pre-Raphaelite tendency of the artist in his earlier life. Amongst the most popular subject works of Millais may be mentioned *The Huguenot*, *Concealed Royalist*, *My First Sermon*, *Apple Blossoms*, *New-laid Eggs*, *North-west Passage*, &c. The best known of Sir John Millais' works by the general public is, however, the one that has adorned the hoardings for some years past—we allude to *Bubbles*. This picture was purchased at a very high price—ten thousand pounds it was said—by an enterprising firm, who use reproductions of it as an advertisement for soap.

Failure of Another Arctic Expedition.—Dr. Nansen and Lieutenant Schott-Hansen have arrived home, having failed to reach the Pole, though they got farther north than any previous expeditions, and have beaten the record by four degrees. They had, however, to "rough" it to an unpleasant degree, until they quite accidentally fell in with Mr. Jackson, of the Jackson-Harmsworth Expedition. With misleading maps, stopped chronometers, and travelling on foot for weeks, the situation, for a time, must have been anything but pleasant.

We have more than once commented on the fact that in all Polar expeditions—as, indeed, now with all expeditions—photography is an important item, but we seldom see or hear anything of the results. It is therefore interesting to learn, from a communication from Mr. Jackson, that something has been done in that direction. Here is a passage: "During the lulls in the gales, and when the sun occasionally shone, we were able to take a large number of valuable photographs, which will give you an excellent idea of the terrible Arctic nature of this ice-capped country." These will, indeed, be an interesting collection.

Protecting Negatives.—At the last meeting of the North Middlesex Photographic Society one of the members mentioned that, another member had told him of a dodge for obviating stains on an unvarnished negative, which consisted of interposing a sheet of papier minéral between the negative and paper while printing. He also mentioned that he found that no loss of definition resulted therefrom. This may be a good way of protecting this film, but many people, no doubt, have wondered why varnishing the film did not suggest itself as the best way of avoiding stains. It is astonishing the number of amateurs, and professionals too for that matter, who complain of stained negatives, from printing, yet how few take the little trouble of varnishing them with the view to their preservation till too late. In this way very many valuable, and irreparable, negatives have been utterly ruined. There is no better way of preserving gelatine negatives that have to be much printed from than that suggested by the late Mr. Wm. Bedford, which is this: Thoroughly fix and well wash the negative; then, when dry, coat with enamelling collodion, and afterwards varnish with a good spirit varnish.

A Note on Thermometers.—Under this heading there is, in the current number of the *Chemical News*, a note by Dr. Phipson on a topic we have more than once dealt with; that is, the incorrect reading of many thermometers whose indications are relied on for accurate work. He points out that though the ordinary laboratory thermometers may be supplied by first-class makers, and be "guaranteed," various discrepant records suggest that the instruments are in fault, and he, himself, having had many thermometers brought to him for testing, has found them wrong by 4° or 5° F., and sometimes even more. For ordinary photographic purposes minute accuracy is not a cardinal necessity, but when the manufacture of pyroxyline, for instance, is involved, a difference of a degree or two of temperature will cause a considerable variation in the quality of the resulting product. Dr. Phipson, however, strangely enough, does not call attention to the simplest method of ascertaining the correctness of a thermometer, that is, to send it to Kew, where, for a sum varying from one shilling, upwards, according to the range of the instrument, it will be tested and a record of its performance given down to one-fifth of a degree F.

The Balloon Expedition to the Pole.—There seems to be, according to recent telegrams, some doubts as to whether Herr Andrée's balloon expedition to the Pole, in which photography is to be a not unimportant feature, is on its way, whether it is in abeyance, or whether it will be abandoned until next year. In due course we have been told that the balloon house has been completed, and everything was ready for inflating the balloon ready for ascent when the wind was in a favourable direction; then that the balloon was inflated, but four rents were discovered in it, and these might cause such a delay that the balloon would have to be left in the balloon house till next year. This, however, has since been questioned by the wife of the maker of the balloon, who says that, if a few weak points were discovered, her husband has with him everything to make them good. One weak place is more than enough in a balloon, particularly in such a perilous voyage as that proposed. Up to the time of writing, the latest news was to the effect that, on the 9th inst., a vessel, thirty miles south of Spitzbergen, encountered a southerly wind, and that its captain believes that Herr Andrée may have started on his journey.

A New Electric Gas Lighter.—The ever-lighted gas burners, as those know only too well who have had them long in use, are so liable to get out of order that the introduction of a simple and automatically lighted burner will be welcomed, for the use of such appliances in the dark room alone is simply invaluable. We have pleasure therefore in calling attention to the "New Era" gas lighter, made by the American Electric Company, Boston, Mass. This new burner is operated only by a key, which is securely attached to the valve, the latter extending up through the body and terminating in the pillar containing a lava tip. The spring electrode is rigidly secured to the pillar, and turns with it when the key is operated. A pin enters this spring electrode and projects a little below it, resting upon and sliding over the surface of a cam. This cam is so constructed that, as the key is turned from left to right, the pin is gradually elevated by the cam, and lifts the point of the spring electrode until it is brought in contact with the point on the fixed electrode. It then falls off from this high position, the contact is broken, the spark is made, and the gas is let on and lighted. In turning the key to the left to extinguish the gas, the pin slides on a lower plane of the cam, which permits the spring electrode to pass under the fixed electrode without contact, after which it reaches an incline, which eventually restores it to its former position.

The Use of Aluminium.—There is at the present time so much capital sunk in concerns established for the manufacture of this metal that it cannot be wondered at that every effort is made to exploit its use in further directions. That its production pays well is shown by the balance-sheet of the Aluminium Company, which enabled a dividend of fifteen per cent. to be declared a fortnight ago. Sir Henry Roscoe presided at the meeting, and he

nticipated still better things in the near future, though he pointed out that the Company's patents for the production of sodium—an important factor in the manufacture—were being infringed in Germany. When the "new metal," as it was called when a cheap way of making it was first discovered—now over a quarter of a century ago—it was called silver white, untarnishable, unchangeable in the air, and so on, and it was largely used for jewellery, and other ornamental purposes. This use soon fell off, for it was quickly found that too much was claimed for it, and that, like nickel, it quickly lost its silvery whiteness, and became more like lead, and often spotty-looking. It is true it can be lacquered, but lacquer will wear off, and then the metal tarnishes. Further, the new, bright metal soils the hands and clothes. Still, when all these objections are urged and proved, the fact of its light weight remains, and it is on this account most valuable for many purposes. Lens mounts, camera fittings, and tripods will continue to be made of aluminium, so long as the owner of such apparatus is aware that nothing unusual has happened, if they become discoloured, no real harm is done.

JOTTINGS.

Bicycles, metaphorically speaking, are in the air. It seems to be the prayer of many people that they were literally so, or, at any rate, that they might be anywhere but on *terra firma;* for the bicycle, if what one hears be true, is responsible for the complete dislocation of several branches of trade, whose representatives therefore regard the wheel fever that is sweeping over civilisation with distinctly unfriendly feelings. The Revenue and Board of Trade returns point to a condition of general prosperity, but many minor industries are crying out against the badness of the times, and they ascribe the depression to the spread of cycling. Oddly enough, the carriage builders do not appear to have been adversely affected by the rivalry of the omnipresent safety; and so far I have not heard mention of a slump in horse flesh. To labour the subject in these columns is obviously unnecessary, and I should not have mentioned it but for the fact that some photographic manufacturers and dealers are joining in the chorus of envious lamentation to which I have referred.

It is possible that some of the fringe of amateur photographers—the butterflies—have, this season, dropped camera work for cycling but I find it hard to believe the attractions of photography to be so slender, or the interest taken in it so small, that any considerable number of persons who have once taken it up will be permanently weaned from it. Experience tends to show that it is all the other way. This year, everything has favoured the cycling boom; "Society" has affixed its hall mark to the wheel; the fair sex, sheep-like as usual, has followed its leaders; the weather has been superb, and trade has revived. Probably next year the boom will still be expanding; but, even then, I do not think that photography will suffer any more than (if it has at all) this year. Cycling and photography do not clash, so far as I can see; neither do they parallelise. Their relations to each other are of an entirely independent nature. *En parenthèse,* it is satisfactory to note that professional photographers appear to have no cause to regret the growth of cycling.

I am aware that many will regard my opinion that cycling and photography have little in common as very heterodox. The two things, I admit, go admirably together—on paper. It is twenty years since I first got astride of a wooden velocipede, and getting on for that time when, in company with another aspiring youth, I first attempted wet-collodion portraiture in a back garden, with very remarkable results. On and off I have been a cyclist and photographer ever since; but, as a cyclist, I have never felt the smallest inclination to carry a camera, while, as a photographer, I have never been tempted to adopt the wheel as an adjunct to photography. I believe my case to be that of many thousands of others. That cyclists *do* take photographs, and that photographers *are* sometimes also cyclists, cannot be denied, but it does not prove the existence of a link between the two pursuits. It is a good many years since articles on cycling and photography began to appear in these pages, and just as long since the old Temple Bicycle Club used to have occasional entertainments, with cyclo-photographs thrown in; but the alliance between cycling and photography is no nearer now than then. In the old ordinary days the cycling journals occasionally had "photographic" departments, which attracted no more attention than they do now, or than a "wheel" column does in a photographic paper. There is just as much reason for journalists making a feature of cyclo-photography as there is for booming photo-cricket, photo-rowing, photo-football, photo-tennis, or photo-tipcat. The expressive if inelegant locution that "there's nothing in it" hits off the worthlessness of the idea to a nicety.

Mr. T. A. Scotton, of 11, Pear Tree-road, Derby, who was included in the various Presidential groups taken at St. Mary's Abbey, York, during Convention week, asks me to state that he would be pleased to receive copies of those groups. On my own responsibility I will add that, doubtless, Mr. Scotton will send exchange prints, which are sure to be good, as he is an able photographer. So far, I have not seen many Convention results, although the opportunities for serious photography, as I have already pointed out, were exceptionally good.

Mention of the Leeds Convention suggests a brief reference to the Convention of the Photographers' Association of America that met in June last at Lake Chautauqua, and full reports of which have just reached this country. Professional photographers from all parts of the States appeared to have been present; a competitive exhibition of photographs was held; papers were read and discussed; excursions made; receptions and a ball also figured on the programme, and there was a plenitude of Convention incidents and humour such as are not wholly foreign to a similar gathering annually held on this side of the Atlantic. But, of the two, the American Convention, judged by the reports, seems to have been by far the more boisterous. On one evening there was a competition among the photographers for the production of the most catchy and amusing "yell!" Boston led off with:—

"Boston, Boston, here we are
All together, rah, rah, rah!
Are we in it, we should smile
We've been in it all the while.
Si—boom—ah!"

I select this as the tamest of many competitive efforts.

The "demonstrator" is a potent force in photography on the other side and at the Convention "Charlie" This and "Tom" That, representing gelatino-chloride paper firms, &c., were fêted right royally in return, one may surmise, for considerable freehandedness in advertising their wares among the photographers present. We read that there was a well-beaten path from Camp Aristo (the Aristotype Company's representatives appear to have camped out) to the hotel, which suggests various reflections. The papers were not too technical or exacting—"How to Treat a Customer" being the curiously chosen title of one—and a very enjoyable time seems to have been experienced. The personal comments made on the events of the week by some of the American photographic papers would scarcely be considered in good taste here.

The *Kodak News,* published by the Eastman Photographic Materials Co., always contains, in addition to many well-reproduced illustrations, some useful practical notes. The little publication does credit to those responsible for its production. I observe in the last number an article telling how two pocket Kodaks placed side by side may be used to take stereoscopic photographs. May I point out that a *single* camera, used in the hand, may also be employed for taking binocular pictures? All that is necessary to do is, when one exposure has been made, to remain quite still, keep the camera perfectly level, and just move it three or four inches to the left or the right, as the case may be, before making the second exposure. The two negatives so obtained will, with the usual treatment, yield

a proper stereoscopic effect. Of course, it is assumed that, if there are any figures in the view, they have not moved between the successive exposures.

Some thin-skinned chemists apparently do not like the Pharmaceutical Society being dubbed a trade union, which it unquestionably is, as I remarked a year ago, just as much as is the Amalgamated Society of Carpenters and Joiners, which, like the Pharmaceutical, exists solely for the aggrandisement of its own members. All the talk about the Pharmaceutical Society "protecting the public" against photographic dealers selling a few pennyworths of mercuric chloride is silly nonsense. Assuredly the public *does* want protection, but it is against the chemists, for taking upon themselves to prescribe for all sorts of ailments, thus encroaching upon the preserves of qualified medical men. It is not a little singular that, after having half ruined the photographic-dealing trade by mercilessly cutting the prices all round, the chemists heap insult on injury by neglecting no opportunity of persecuting the dealer with that model of privileged inquity, the Poisons Act, the schedule of which is a disgrace to the legislature. As to that trade union, the Pharmaceutical Society, I recommend its defenders to read the remarks of the Edinburgh Judges and press on its action last year in prosecuting two Edinburgh dealers for calling themselves "photographic chemists." They should have been sufficient to make any self-respecting Society petition to have its charter revoked.

COSMOS.

PHOTOGRAPHIC CHEMICALS AND THEIR ADULTERATIONS.

WITHOUT some knowledge of the chief adulterations ordinarily to be met with in the photographic chemicals of commerce, and of the tests whereby these adulterations may be detected, the technical equipment of the practical photographer, however perfect it may be in other respects, cannot be regarded as complete.

When we take into consideration the extreme delicacy of the beautiful series of reactions upon which photography is based, we shall, I think, be ready to admit that the absence or presence of impurities in our chemicals may have a larger share of influence on the quality of the results than we have hitherto suspected. Many of the defects which we are wont to attribute to other and quite different causes would probably, on investigation, be found easily traceable to the unsuspected door of the manufacturing chemist, and, the real culprit once identified, the growth of the mighty army of anxious inquirers and puzzled editors would no longer increase by leaps and bounds.

After all, the photographer has the remedy—to a large extent at least—in his own hands. A very slight familiarity with the processes of elementary analytical chemistry will enable him to distinguish between good chemicals and bad, a measure of knowledge amply fulfilling all his requirements.

For convenience' sake, adulterations may be broadly divided into two great classes, the active and the passive.

This division is not arbitrary, but essential, and is accordingly of more than merely theoretical importance.

By active adulterations are to be understood all such impurities as are possessed of properties actually injurious to any process or product into which they may find their way. By passive adulterations, on the other hand, are comprehended those adulterating bodies whose presence is without influence on the reactions into which they may be introduced, except, indeed, in so far as it weakens the active properties of the ingredients in which they exist as contaminations.

Now, if we are careful to observe the distinction between these two classes of bodies, it will greatly facilitate our analytical operations; because, having once, by simple testing, identified an impurity of the first or active class, we are spared the trouble of estimating its actual proportions, and for this very obvious reason, that any body which is *per se* of a harmful character ought to be rigidly excluded, whether its actual percentage be large or small.

The only remedy under the circumstances is to substitute a good article for a bad, and, fortunately for the photographer, this can generally be easily done.

A different course may, however, be pursued in the case of the other or harmless class of adulterations. With regard to these, seeing that their influence wholly depends not on their quality, but on their proportions, the processes of quantative analysis may often be employed with advantage. Once the percentage of the adulterating bodies has been ascertained, due allowance can, of course, be made for any action which, indirectly, they are likely to exert in that particular branch of work in which the crude chemical finds its proper application.

On this account I have not hesitated to introduce to the photographer's notice several processes pertaining to quantitative analysis. These, however, are mostly of a simple character, my object here, as elsewhere, having been to restrict myself to the description of such tests as do not make too serious a demand on the knowledge and skill of the operator, or require, as a condition of success, the elaborate and complicated adjuncts of the chemical laboratory.

I propose, in the first place, to treat of the adulterations of the principal metallic salts employed in photography; after this, the adulterations of certain of the acids and alkalies will claim their share of attention; and, finally, I shall have to speak of the impurities of one or two miscellaneous compounds not referable to any single distinct head.

I.—POTASSIUM SALTS.

Bicarbonate of Potash.—The formula of this salt is $KHCO_3$. The pure crystallised bicarbonate should contain forty-seven per cent. of potash. The commercial bicarbonate frequently contains a percentage of neutral carbonate, together with moisture, insoluble earthy matter, and traces of potassium sulphate and chloride.

Neutral potassium carbonate, if present, may be detected by the orange red precipitate which is produced in a solution of the sample on the addition of a few drops of a strong solution of mercuric chloride. The superfluous moisture may be estimated by drying a weighed portion of the sample in a watch glass over sulphuric acid under a desiccator, and noting the loss of weight from time to time, as long as any change is apparent. The moisture cannot be determined by heating, as the salt is thereby decomposed into carbonic acid, water, and neutral carbonate. The silica and insoluble matter may be estimated by collecting them on a weighed filter, which, after washing and drying, being reweighed, will, by its increase of weight, afford the data for calculating their percentage. Potassium sulphate may be detected by dissolving forty or fifty grains of the sample in dilute hydrochloric acid, and then adding a strong solution of barium chloride, which will produce a white precipitate if any sulphate be present. If no sulphate be present, potassium chloride may, in its turn, be identified by dissolving the bicarbonate in dilute nitric acid, and treating the concentrated liquor with solution of nitrate of silver, whereby any chloride will be precipitated in the form of chloride of silver.

Independently of these tests, the general purity of a sample of bicarbonate may be very readily ascertained by means of the following simple volumetric process. A standard solution of pure oxalic acid is prepared by dissolving 6·3 grains of the crystallised acid in an ounce of distilled water. This solution should be effected in an alkalimeter tube or burette of 1000 fluid grains' capacity. When the acid has been dissolved, water must be added until the bulk of the whole is exactly 1000 grain measures. Oxalic acid being bivalent, and 6·3 grains being one-twentieth of its molecular weight, the whole volume of the solution is therefore equivalent to one-tenth of the molecular weight of the bicarbonate of potash, which tenth amounts to exactly 10·01 grains. Ten grains of the sample should be dissolved in half a pint of water contained in a white porcelain basin. The liquid having been coloured a deep blue by means of a few drops of solution of litmus (or cochineal extract, in which case the colour will be violet), the oxalic acid solution is then added gradually from the alkalimeter, and the addition is continued until the last trace of violet is replaced by a vivid pink, indicating the completion of the reaction. Should the sample be pure, this stage will not be reached until the whole contents of the alkalimeter have been exhausted. Should it, as is suspected, be adulterated, the extent of the adulteration may be estimated from the volume of oxalic acid consumed in the process.

Supposing that 900 measures have been consumed, we know that, as every hundred measures are equivalent to one grain of pure bicarbonate, ten grains of our sample must contain nine grains, or ninety per cent., of bicarbonate, and one grain, or ten per cent., of foreign matter.

Potassium Bichromate.—This salt is often contaminated with sulphate of potash. Sometimes, too, it contains traces of alkaline carbonates. Sulphate of potash in a sample may be detected by adding to the aqueous solution, previously strongly acidified with hydrochloric acid, a few drops of a weak solution of barium chloride.

Any sulphate present is precipitated as barium sulphate. Carbonates, if present in quantity, may be identified by the effervescence which ensues when the dry sample is treated with dilute hydrochloric or sulphuric acid. The powdered sample should be wholly

soluble in water. When dried in a water bath, it should not appreciably lose in weight, seeing that the pure crystallised bichromate is an anhydrous salt.

Potassium Bromide.—This salt occasionally contains traces of potassium carbonate or hydrate. Instead of testing for these separately, it is more convenient that the percentage of bromide in a weighed portion of the sample be alone determined. This may be done as follows: Dissolve 8·5 grains of pure crystallised nitrate of silver in 1000 grain measures of distilled water. Each 100 measures of this solution are equivalent to ·595 grain of potassium bromide. Dissolve five grains of the sample to be tested in a pint of distilled water, transfer to a porcelain basin, and add a small crystal of potassium chromate. The yellow liquid is then titrated with the nitrate solution, the latter being added from a burette or alkalimeter tube. When the yellow colour is changed to an orange-brown, and when, at the same time, the red precipitate of chromate of silver no longer dissolves freely, the reaction is completed. From the number of grain measures consumed, the percentage of bromide may then be calculated. If the sample be free from adulteration, 840·3 measures will have been required.

Carbonate of Potash.—The anhydrous neutral carbonate is that usually employed in photographic processes. The crystallised salt contains two molecules of water. The former is frequently very impure, the principal impurities being those referred to in speaking of the bicarbonate of potash. They may be detected by the tests already mentioned. The carbonate being exceedingly deliquescent, the determination of the percentage of moisture in a sample should never be omitted. It may be estimated by the loss suffered when the sample is heated to low redness in a porcelain crucible.

Potassium Cyanide.—The commercial cyanide is a very crude salt, and frequently contains less than thirty per cent. of the pure cyanide. Among the impurities the following are of most frequent occurrence:—Carbonate of potash, cyanate of potash, potassium ferrocyanide, potassium sulphide, potassium sulphocyanide, and alkaline chlorides and sulphates. The carbonate of potash may be dissolved out by digesting the sample with alcohol of ·853 specific gravity. The residue, dissolved in water and treated with barium chloride solution, will, on boiling, give a white precipitate of barium carbonate if cyanate of potash be present. If a white precipitate of barium sulphate be produced before the solution is boiled, it must be filtered off, and the test repeated on the filtrate. Potassium ferrocyanide may be detected by the blue precipitate which is produced when the acidified aqueous solution of the contaminated sample is treated with a solution of ferric chloride. If potassium sulphide be present, it may be identified by the brown precipitate which appears when the solution is treated with acetate of lead.

Strongly acidified with hydrochloric acid, in which ferric chloride has been dissolved, the solution turns red when potassium sulphocyanide is present. Sulphates may be detected in the sample by treating the aqueous solution with barium chloride, and boiling the precipitate so produced with excess of dilute hydrochloric acid, in order to dissolve out the barium carbonate. The residue will be barium sulphate. Most of these impurities are of the harmless class. Samples, however, which contain more than a trace of potassium sulphide are unsuitable for photographic purposes, and should be rejected. The same may perhaps be said of those containing sulphocyanide. Under ordinary circumstances, it will generally be found sufficient merely to estimate the percentage of cyanide present in the sample. This may be done volumetrically, a standard solution of nitrate of silver, of the same strength as that required in the analysis of potassium bromide being required. Each 100-grain measures of the solution are equivalent to ·27 grain of hydrocyanic acid, and, consequently, to ·46 grain of pure potassium cyanide. Five grains of the powdered sample are transferred to a porcelain basin, and dissolved in ten fluid ounces of water. The silver solution is to be added from the alkalimeter until the liquid begins to be turbid from the formation of a faint precipitate. The alkalimeter is then allowed to drain, and the number of measures consumed is read off on the scale. From this number the percentage of cyanide present is then calculated.

Potassium Ferrocyanide.—The crystallised salt is in general sufficiently pure for the purposes of photography. When purchased in the powdered state, it should be tested for carbonate of potash. This may be done by dissolving it in water, and treating it with a strong solution of calcium chloride. Any carbonate present will be precipitated as calcium carbonate. The sample should be perfectly soluble in water. Any insoluble residue (consisting of the oxide or sulphide of iron) may be removed by filtration.

Potassium Iodide.—The commercial salt frequently contains carbonate of potash, and also potassium iodate, sulphate, and chloride. The presence of the first may be detected by the effervescence which ensues when the powdered sample is moistened with dilute hydrochloric acid. The salt may be purified from carbonate and iodate by digesting it in hot strong alcohol, when these adulterations, being practically insoluble, will be left behind, and may be removed by filtration.

Potassium sulphate may, as usual, be detected by the addition of barium chloride to the aqueous solution, previously strongly acidified with hydrochloric acid to prevent precipitation of any carbonate present. Potassium chloride, if present, will be precipitated along with the iodide on adding a few drops of solution of nitrate of silver. On treating the washed precipitate with ammonia, the chloride of silver only is dissolved, and, after separation from the residue of yellow iodide, may be reprecipitated by the addition of a little weak nitric acid to the ammoniacal solution. The percentage of iodide in a commercial sample may be estimated volumetrically. For this purpose, 8·3 grains of mercuric chloride must be dissolved in 1000 grain measures of water. Take twenty grains of the sample, dissolve in water in a basin, and, having filled an alkalimeter with the chloride solution, add the latter gradually, stirring the contents of the basin continually during the titration. Continue the addition until the red precipitate of mercuric iodide is no longer dissolved. The number of degrees consumed, multiplied by 1·3083, will give the percentage of potassium iodide in the sample.

Potassium Oxalate ($K_2C_2O_4 \cdot 2H_2O$).—The commercial salt frequently contains carbonate of potash. When crude oxalic acid has been employed in its preparation, it may also contain traces of insoluble organic matter. To detect the former, treat the aqueous solution with solution of calcium chloride. The mixed precipitate of calcium oxalate and carbonate thereby obtained, treated with hydrochloric acid, dissolves with effervescence, due to be liberation of carbon dioxide. If, however, the precipitate consist only of calcium oxalate, no effervescence will result. Any insoluble matter which the sample contains may be separated from the solution by filtration in the ordinary manner.

Potassio-aluminium Sulphate.—This salt, the common potash alum of commerce, is often contaminated with potassium chloride, sulphate, and chloride of iron, and insoluble siliceous matter. In testing for chlorides, the aqueous solution of the sample must be treated with acetate of lead. Any chlorides present will be precipitated in the form of chloride of lead. If salts of iron be present, a reddish-brown precipitate will be produced when caustic potash is added in excess to a boiling solution of the sample. Another portion of the solution may be boiled with dilute nitric acid, and tested with ferrocyanide of potassium. A blue precipitate will indicate iron. Samples of alum which contain more than a mere trace of ferrous and ferric salts should not be employed by the photographer, on account of the appreciable influence which these salts exert upon the compounds of silver. Any silica and insoluble earthy matter present as contaminating bodies may be removed by filtration.

The various salts of potassium of which I have been treating include all those which are required in the ordinary processes of photography. In my next paper I shall deal with the salts of sodium and ammonium and their adulterations, after which, if space suffices, I shall have something to say concerning the salts of the heavy metals.

MATTHEW WILSON.

CALOTYPES.

Now that photography reaches each year a higher and higher place among handicrafts, and the number of people interested in it directly or indirectly becomes larger as time rolls on, an increasing interest manifests itself in the memorials and relics of the earlier stages of its career. The earliest, or one of the earliest, of the practical processes was the calotype, the invention of Talbot, after whom it was frequently styled Talbotype; and of this beautiful process there are many specimens extant.

The Royal Photographic Society, of late years, has been forming a collection of these calotypes in its museum, and those who are interested in the results obtained by their forerunners in the "forties" cannot do better than examine the many specimens in the Society's collection. First in importance, as being the actual hand work of the inventor are a number of paper negatives of streets in Frankfurt-on-the-Main, and other apparently German towns, views on the Rhine, &c. These were taken in or about the year 1843, and have written on them, by Talbot himself, some of the particulars as to their production, such as: "Frankfort. Gloomy with rain, forty minutes." Most of these have the skies blocked out with Indian ink, while a print which accompanies them shows no signs of fading.

The first book to be illustrated by photographic means, as is well known, was the *The Pencil of Nature*. In the Society's copy of this important book, which was formerly the property of the late J. Traill Taylor, is the following inscription in that gentleman's writing: "*Talbot's Pencil of Nature, The Earliest Work on Photography*. The negatives were taken (on paper) anterior to 1843. The prints are on plain paper, anterior to the discovery of gold toning. The fading of some is caused by the paste around the margins." "The Earliest Work on Photography" should obviously read *by* photography, since Daguerre's own book had run through two editions in this country in a translated form, and had been followed by several others of like nature. Speaking of this work of Daguerre's, it may not be generally known that the manuscript of it was offered for sale in this country a year or two ago, when the writer had an opportunity of examining it. It was in an excellent state of preservation, but the bulk was in the handwriting of an amanuensis although some of the corrections, if not all, appeared to be in the author's own writing.

But to return to our subject. *The Pencil of Nature* appeared in six parts, issued by Longmans at irregular intervals, the first being sold at 12*s.*, part two at a guinea, and the rest at 7*s.* 6*d.* each; the first part appeared in 1844, and the last in 1846. The title-page, which is printed in two colours, red and black, in addition to the publisher's name and date, contains merely the words, *The Pencil of Nature*, by H. Fox Talbot, Esq., F.R.S., &c., and the motto, "Juvat ire jugis qua nulla priorum castaliam molli devertitur orbita clivo." The introductory remarks, which occupy three pages, are followed by a brief historical sketch of the invention, narrating how the first suggestion of fixing the image of the camera obscura occurred to Talbot while sketching on the shores of Lake Como with the aid of Wollaston's camera lucida. The plates, which are twenty-four in number, measure 8×6¼ inches, the dimensions of the mount being 12×9 inches. No. 3 has for its subject some china, and the letterpress contains the earliest allusion of which I am aware to the use of the stop in a photographic lens. Of this Talbot says, "The glass should be diminished by placing a screen or diaphragm before it, having a circular hole through which alone the rays of light may pass. When the eye of the instrument is made to look at objects through this contracted aperture, the resulting image is much more sharp and correct. But it takes a longer time to impress itself upon the paper, because, in proportion as the aperture is contracted, fewer rays enter the instrument from the surrounding objects, and, consequently, fewer fall upon each part of the paper." Later on, Talbot complains that the green rays act very feebly upon the paper, and hence render it difficult to photograph buildings of a very light colour at the same time as trees, &c., while with plate seven, the leaf of a plant, further particulars as to the effect of different-coloured rays upon the paper are given, and the experiment suggested of filling a room with the invisible rays at the violet end of the spectrum in which objects might be photographed, although persons in the room would remain invisible to one another.

Plate XII. represents the bridge of Orleans, and will be subsequently referred to; while Plate XIV. represents a group of three men with a ladder, and is an early example of portraiture by the calotype process. *Apropos* of Plate XV., Talbot states that his country home, Lacock Abbey, Wilts, was the first building "ever yet known to have drawn its own picture. It was in the summer of 1835 that these curious self-representations were first obtained. Their size was very small; indeed, they were but miniatures, though very distinct, and the shortest time of making them was nine or ten minutes."

But enough has been said of this interesting work, which has been described at greater or less length many times before, and with the remark that the fading which has taken place is mainly at the edges, the centre of each print being of a deep red colour, which was presumably its tint when first prepared, we will leave the *Pencil of Nature*.

In the year 1845, that is between the publication of the first and last parts of the *Pencil of Nature*, a book called *Sun Pictures in Scotland* was produced by Talbot. Most of the prints are similar to size and preservation to those in the more important work; but the last ten of the twenty-three prints it contains are about 4×3¼ inches only, and are mounted two on a page. It is doubtful whether this book was ever offered for sale: no publisher's name appears, the title-page merely bearing the name of the book and author, the same motto as in the *Pencil of Nature*, and the inscription, "London, 1845," but copies of it seem fairly numerous. The Royal Photographic Society acquired theirs some three years ago, and since that date the writer has had another through his hands. The letterpress which helped to make the *Pencil* interesting is here absent, the only information given, beyond the titles of the various pictures, being a printed slip with the following words:—"*Notice to the Reader.*—The plates of the present work are impressed by the agency of light alone, without any aid whatever from the artist's pencil. They are the sun pictures themselves, and not, as some persons have imagined, engravings in imitation."

In addition to the foregoing, there is in the Society's collection a fine album, very recently acquired, containing eighty-two calotypes, which are, generally speaking, in much better preservation than the foregoing. This is undoubtedly due to the mountant, which in this case must have been less conducive to fading, and has been applied all over the prints. It contains in MS. a list of the subjects, and an inscription to the effect that they were taken in 1843 and are among the earliest examples of photography. Whether they were all taken in 1843, or whether some of them must be referred to a later date, seems doubtful, as well as the original owner of the work. In all probability this was, however, Talbot himself, since many of the subjects are those in the *Pencil of Nature* and in *Sun Pictures in Scotland*, which are known to be his work, and they are, moreover, better prints than those in the published books; in fact, one or two of the prints in this book would hold their own easily with those produced to-day in every respect. Notably is this the case with an old arched doorway, which is a fine print without any traces of fading whatever. The additional subjects in this book are chiefly views in Oxford, Cambridge, Dublin, Kenilworth, Rome, and Malta, and it is safe to say that it represents in itself alone the finest collection of calotypes got together prior to the year 1847.

In the year 1846 the *Art Union*, a periodical afterwards known as the *Art Journal*, published a lengthy account of the "Talbotype sun pictures," and gave as an illustrated supplement to this a print from one of Talbot's negatives which had been used in the production of the *Pencil of Nature*. Different copies of the paper got different subjects, the Society's copy containing a print of the "Bridge of Orleans," already referred to. It is attached to a sheet of paper, the size of the periodical, by its edges, and, as in the case of the print in the *Pencil*, is very much faded—so much so, in fact, that little beyond the heaviest shadows are to be seen. The other copies of the periodical which the writer has at different times seen have all been faded in an equal degree. An adhesive label under the print informs the reader that it was taken from nature in 1843.

With this copy of the *Art Union* was issued a circular, a copy of which Mr. T. Bolas recently presented to the Society, which states that it is intended to send "well-qualified persons to visit America, the Indies, and other distant lands, and to bring home from thence authentic views of the natural scenery of those regions," and which refers once more to the belief that these early calotypes were not actual sun pictures, but engravings or lithographies (*sic*) made from the original image obtained by light. The terms for licences to work are stated as being, for amateurs, one guinea; for business purposes, "according to circumstances."

Hitherto the calotypes mentioned have been mainly the production of Fox Talbot himself, but in the next volume to be mentioned this is no longer the case. *Calotypes by David Octavius Hill, R.S.A., and Robert Adamson. Edinburgh MDCCCXLIII. to MDCCCXLVIII.*, is in every sense of the word a magnificent work. Its pages, over a hundred in number, are 25×18 inches in measurement, and are handsomely bound with gilt edges, the whole book weighing many pounds avoirdupois. The promise of such an exterior is not disappointed on opening the volume, except, perhaps, as regards the dimensions of the photographs themselves, which are never more than about whole-plate size, and seem lost on such large mounts. They are, generally speaking, in good preservation—in some cases, in conspicuously better preservation than their mounts, which are dotted here and there with mildew—and bear out an observation based on other specimens that, broadly speaking, calotypes which have been mounted by the edges only have faded; those which have had the mountant applied all over their backs have remained very much as they originally appeared. This fading, although commencing at the edges with an irregular termination towards the centre of the print, suggests at first sight that it is the nature of the mountant itself which has given rise to the fading, and this is, no doubt, what has usually occurred, although it frequently happens that the fading so started has taken place also over the unmounted parts as well.

Artistically, those best qualified to speak pronounce the joint productions of D. O. Hill and Robert Adamson as of great value. Mr. Maskell—surely no mean authority on such matters—coming across some of Hill's work some year or so ago, pronounced him to be a "man of the very earliest days of photography whose work would appeal, both in portraiture and in landscape, to the most advanced supporters of 'the new movement'" which in photography

it will be seen dates from 1843). Mr. Maskell is so far almost the only photographer we know who has drawn attention to the work of Hill, and who has attempted to give him the place he undoubtedly deserves in artistic photography; but, in so doing, he seems to minimise the part played in these joint productions by Robert Adamson (whom he calls John Adamson) on the ground, apparently, that he was a "distinguished chemist." Chemist or no chemist, he and Hill between them are to be thanked for the production of a series of photographs which are not only highly meritorious in themselves, but which are in many cases portraits of celebrities of a most valuable character, and portraits which should be copied by some more permanent methods without loss of time. Amongst others, Lady Eastlake, Dr. Chalmers, Professor Fraser, Sir John Steele, R.S.A., Wm. Etty, R.A., Sir W. Allan, and James Ballantine are portrayed in the volume in the possession of the Royal Photographic Society, together with a number of subjects, such as "Newhaven Fish Wives," "Soldiers at Edinburgh Castle," &c.

In addition to the foregoing, the Society's collection contains a number of calotype negatives by Corelli Bere, and some prints by the process of scenes in the neighbourhood of the Crimea by Mr. Maynard. They are being added to from time to time as occasion offers, and already occupy the most prominent place in the museum which the Society is gradually acquiring. R. Child Bayley.

BY-PATHS OF EXPERIMENTAL PHOTOGRAPHY.

(President's Address to the Hackney Photographic Society.)

It has seemed to me that the circumstances and the occasion of this address warrant its being cast in a comprehensive rather than in a particularised form. My predecessor, Mr. E. J. Wall, supplies me with a precedent for this course; for, if I remember aright, he devoted his inaugural address to an examination of the advantages of specialistic photography, enumerating the various branches of work that may be taken up, and recommending the individual photographer to select one of those branches and acquire a mastery of it, in preference to dabbling in several. Society activity is about to recommence, and indoor work will again receive more attention than it has received during the past three or four months, so that the opportunity is, possibly, a favourable one for an address of this nature, which, if it possesses, in some persons' estimation, the disadvantage of being technical and not artistic, may, I hope, balance that defect by the quality of being intelligible.

The Encouragement of Photographic Research.

In a paper that was recently read before one of the societies it was sought to ascertain in what manner, and by what means, photographic societies could benefit photographic art. Opinion has also been expressed that photographers in conclave do not give much attention to art subjects; and some photographic extremists even appear to think that discussions on technical matters are entirely superfluous. I can well sympathise with the section of photographers that laments the neglect to which art is subjected by photographic societies, for, paradoxical as it may sound, I entertain the converse feeling that photographic societies do not by any means attempt or achieve enough for technical photography. It is quite true that facilities for the reading of papers, and the holding of discussions thereon, are abundant; but the ultimate benefit to photographic progress would probably be greater were original experimental work and research singled out for encouragement by the hundreds of photographic societies in the United Kingdom.

That the need for some such extraneous encouragement has been observed and felt is evident from the action of the Photographic Convention of the United Kingdom, which has set aside a portion of its capital and income for the institution of a fund to be applied in aid of research. It is permissible to hope that occasion may shortly arise for the expenditure of some of this money. In the mean while, it is of interest to note that independent photographic investigation reposes in the hands of but very few men. To mention Dr. Hurter and Mr. Driffield, Captain Abney, Mr. Bothamley, Mr. Haddon, and Mr. F. B. Grundy, is to name probably all those who have recently undertaken independent and original experimental work of the first class. The number appears extremely small, but it must be remembered that such investigations as these men take in hand demand an amount of time and an extent of knowledge and application such as few persons possess, or, if they possessed it, would care to expend gratuitously. It is no secret that Messrs. Hurter & Driffield's work in the determination of the speed of plates extended over a period of several years; that Mr. Bothamley has been following up the action of colour-correct sensitisers for a very long period; and that the beautiful experiments in ascertaining the extent to which silver prints really need be washed after fixation, which look so simple on paper, cost Mr. Haddon months of time and work.

Wanted—A Substitute for Hypo.

With the suggestion that photographic societies might well co-operate in a concerted effort to provide the means for the greater encouragement of photographic research, I may next be allowed to point out that there still remains a wide field open for investigation work of a minor nature, which either individual photographers or societies might undertake at comparatively little cost of time or money. Take, for example, the question that has from time to time cropped up as to the replacement of hyposulphite of soda by a less troublesome but equally efficient fixative for negatives and prints. You are, doubtless, aware that the silver salts are more or less soluble in the alkaline chlorides and bromides, in the sulphocyanides, in sodium sulphite, and in ammonia. In the very early days the first-named were used for prints, but did not answer satisfactorily, as they were said to be not perfect solvents. Potassium bromide was used with more success, although its action was slow, and the addition of strong ammonia to the hypo bath has been, and is, occasionally recommended to facilitate fixation. Sodium sulphite has been found to be a too weak solvent. The drawback to the employment of potassium cyanide for negatives and prints is that, being a fairly powerful solvent of metallic silver, it must be used weak and carefully, otherwise your half-tones are likely to suffer; but the sulphocyanides have been used as fixing agents, though they are somewhat inferior in power to hypo for the purpose. The greater solubility of silver chloride in these and other reagents suggests that, for paper prints, it might be possible more readily to displace hypo for fixing prints than for negatives. Probably the sulphocyanides, according to the stated solubility of the silver haloids in them, give most hope of success for the double purpose; but the entire subject is one that awaits exhaustive experiment, and is well worth taking up when we consider that, notwithstanding its excellence as a solvent, hypo has many well-known drawbacks, of which few of us are without experience. I suggest the subject as being well within the reach of individual experiment, as the work required is obviously not of a very complex character.

Orthochromatics

The very interesting subject of orthochromatic photography demands in its higher branches—such as the effect and action of various dyes on gelatino-bromide of silver, and the determination of the spectrum sensitiveness of the preparation—an amount of care and close attention that the ordinary member of a photographic society is, as a rule, unable to bestow upon it; but there is one division of the matter that has recently come into prominence in which many are well qualified by time and endowment to take part. I allude to the alleged orthochromatic properties of sensitive plates not specially corrected for colour. You are aware that it is held by many that by the use of suitably selected coloured screens an ordinary plate may be made to yield an orthochromatic effect, but that the practicability of such a result is denied by others. Such a point as this—which appears to conflict with the theory generally held with regard to orthochromatic photography, viz., that the use of a coloured screen on a non-colour corrected plate merely increases the exposure without imparting to the plate sensitiveness to the less refrangible spectrum rays, is one well within the power of a fairly skilled worker to refute or confirm. On the other hand, the theory I have referred to frequently receives, in the experience of all of us, a very rude shock, for, no matter what colour of glass or fabric we use in our dark-room lamps, are we not always careful to keep the light as much as possible from our plates, and do we not often find that some amount of exposure to that light produces fog? I myself have found this to be the case even with glass that has been guaranteed to cut out the actinic rays, and the experience is one that seems to contradict the theory of the non-sensitiveness of ordinary plates to yellow and red. But the conditions governing the reproduction of objects in colour-correct values not only deserve more study than they receive, but it is quite certain that colour-sensitive plates are not used so much as they ought to be. This is more especially apparent with the growth in use of half-tone blocks. These always strike me as having a tendency to degrade the colour values of the originals, which might frequently be obviated by the employment of colour-sensitive plates in the taking of the negatives.

Developers, &c.

There is, again, the apparently simple but really complex question of development. This, it is true, receives a vast deal of attention at photographic society meetings, which, however, is seldom of a nature to make any reliable addition to our knowledge. For what are known as the newer developing agents, all sorts of advantages and properties have been claimed that have been admitted by some, and denied by others, on far from complete evidence. It is really a difficult matter to convince most old workers that for negative work pyro ammonia and pyro soda, and for bromide paper ferrous oxalate, are excelled by more modern compounds, and this is not surprising when we consider that no attempt has been made to demonstrate by scientific means wherein the practical advantages of the newer reagents are supposed to lie. This is a branch of investigation eminently adapted to be taken in hand by photographic societies, for it would be a simple matter to lay down uniform conditions of working, within the limits of which any photographer of ordinary intelligence could keep himself. It is questionable, however, whether the matter is now really worth taking up until a problem of much greater importance has been solved. I allude to the nature and constitution of the latent or undeveloped image, a subject that appears to have been lost sight of during recent years. It may be fairly conjectured that, when

this fascinating but elusive secret of science has been unlocked, development will enter upon a new phase, and that therefore we are at present dealing with an unknown product, which leaves us very much in the dark as to what development really is—I mean, of course, the precise action that takes place in the reduction of the exposed surface.

In determining the merits and properties of a given printing process, or for making comparisons between various papers, so far as their power of rendering the scale of gradation contained in our negatives is involved, or, indeed, for arriving at the actual scale the paper is capable of depicting, the members of a society, all working under determined equalised conditions, might accomplish some really valuable work. It is matter for surprise that comparative experiments of this kind should be virtually neglected, and mere individual expressions of opinion or solitary experiences relied upon in preference. This suggestion is obviously typical of others in which advantage might be taken of the circumstance that a number of workers, as represented by a photographic society, could avail themselves of the opportunity of studying a subject concurrently, and of subsequently comparing results.

Societies as Agencies for Research.

These illustrations, indicative of the existence of easily traversed by-paths in experimental photography, are merely typical, and might be almost indefinitely increased, but those I have chosen serve, I hope, to prove my point, that there is a wide field open for research work of a minor kind. Nevertheless, I am appealing less to individual photographers than to members of societies collectively to divert a portion of their efforts in this direction. The difficulty of filling a season's programme is one experienced and complained of by nearly all honorary secretaries; but that difficulty, I venture to suggest, arises from the habit they have of too often looking away from home for men and material. Most societies nowadays include within their membership one or two men of more or less chemical and physical knowledge, and few are without several of proved photographic ability. Would it not be possible, then, for these societies, utilising the knowledge possessed by such members, occasionally to depart from the beaten track of set demonstrations, papers, discussions, or lantern evenings, and systematically to undertake and report on the investigation of some of the innumerable little chemical and other problems which modern photography still offers for solution? A great deal of useful knowledge, even of a negative character, might be gained in this way. In their collective capacities, societies hold exhibitions and excursions, and they undertake surveys, the publication of journals, and so forth; so why not a little serious work in the shape of research? Of course, one always thinks the most of one's own ideas, and I fancy I discern in the one I am tendering you the germ of what possibly might prove to be a valuable movement; for assuredly a combination of some 300 societies, all willing to aid in research work, could be made a powerful factor in photographic progress.

It is perhaps of use to remark that one of the drawbacks to individual experiment or research is to be found in the circumstance that confirmation or verification of one's results is not always to be had. This difficulty is one that vanishes in the case of a society possessing several members competent to undertake such work, and is another argument in favour of my suggestion.

Suggested Exhibition of Pure Photography.

All that I have hitherto said is a plea on behalf of constituting photography a craft or science of precision. Photography, as an "art," is already well looked after. We have it on unimpeachable authority that it demands little or no photographic knowledge, and therefore it does not exact precision of aim or application. It demands imagination, and in recent years, at any rate, it has had it to such an extent that humble mortals like myself have occasionally been driven to conclude that the authors of many so-called art photographs have relied too much upon their imaginations, or have exercised them when they are in a condition of disease or decay. It is time, I venture to submit, that the technical photograph had its share of popular attention and applause. We have exhibitions, occasionally of a peripatetic character, devoted to pictorial photography, in which photography, *qua* photography, plays a part of relatively small importance; do you not think, therefore, that an exhibition exclusively devoted to *technical* photographs would come as a welcome change? The Royal Photographic Society might consider the idea; for it is said that during the last four years its annual exhibitions have been so excessively well patronised by "pictorial" photographers—the competition to be hung in Pall Mall has, in fact, been so keen—that for lack of accommodation a number of disappointed would-be exhibitors have been compelled to take refuge elsewhere, and thus in neither place has pure or technical photography received that share of attention which is clearly its due.

Thomas Beddino.

THE REPRODUCTION OF MOVING OBJECTS.

Photography has, during the past year, made many claims on the attention of the public. The truly wonderful results obtainable by Röntgen's method will continue to excite the interest and admiration of those interested in matters scientific, and will find extensive application in surgical circles. To the layman, however, says *Anthony's Bulletin*, perhaps one of the most marvellous outcomes of photographic research and inventive ability is the combination of instruments for reproducing, with practically absolute fidelity, moving objects, and exhibiting them in enlarged form upon a screen, with all distinctness, and with a truth that is amazing. What the phonograph does for the voice, the new apparatus does for objects in motion. With a perfect phonograph and a perfect apparatus, such as we are about to describe, the words and actions of any speaker or number of persons may be recorded and exactly reproduced at any time. The full significance of this it is not easy to recognise to-day; but, as the years roll by, the value of a combination of phonograph and vitascope will be appreciated. Events of to-day will be reproduced for posterity, and our children will marvel at our customs and scoff at our points of weakness. As a means of recording important events, the vitascope stands easily first.

We use the word vitascope without desiring in any way to give offence to the makers of other similar instruments, all of which are excellent in every way. The projecting apparatus is known under the names eidoloscope, vitascope, kinecpticon, animatographe, and cinematographe, and in the results, as shown in the theatres and music halls, there is very little to choose between them.

The kinetoscope is, doubtless, familiar to all our readers, and the objections to it are obvious. The small size of the image, the obvious photographic effect, and the fact that only one person can, at a given time, view the travelling band of film, militate against its commercial success. Just as the sounding apparatus has, to a large extent, superseded the ear pieces in the phonograph, so the projecting apparatus has relegated the kinetoscope to comparative obscurity. In the new apparatus the images on the travelling band of film are enlarged to life size and thrown upon a screen, thus affording an opportunity for the effect to be witnessed by a large audience.

The general principle of the method is as follows:—A band of sensitive film, about one and three-quarter inches wide, and some 150 feet long, is, by means of suitable mechanism, exposed upon an object in such a manner that a series of successive exposures are made upon the band of film with a rapidity of from twenty-eight to fifty per second, each negative measuring about seven-eighths of an inch long and three-quarters of an inch wide. This band of film is then developed in large wooden tanks, fixed, washed, and dried, being afterwards run through a machine in contact with a second sensitive strip, upon which a series of positives are made by exposure to an electric light. This positive strip is developed and treated in the usual manner, the result being a succession of small lantern slides. This strip is punctured to fit the driving machinery, and is then run through the projecting apparatus at a very high speed, with the result that the object is reproduced upon the screen, showing the exact motion and expression existent at the time of exposure. The method, then, consists in making a succession of negatives in as short a time as possible, and exhibiting positives made from them in such a manner as to make one succeed the other as rapidly as possible, the impression to the eye being that of continuous motion.

The effects produced are simply wonderful. One very well-conceived and remarkably successful record is that showing a suburbanite watering his garden by the aid of a hose pipe. His mischievous boy steps upon the pipe, thus cutting off the supply of water. The innocent amateur gardener, after puzzling over the cause of the trouble, proceeds to investigate, finally examining the nozzle. The youngster removes his foot, deluging his respected parent, who, after a lively chase around the garden, catches the urchin, and administers chastisement. Shown on the screen, enlarged to life size, it is a truly remarkable series. Every expression of consternation, glee, and disgust, and the various evolutions performed by each from start to finish, are faithfully reproduced, and the audience is aroused to a pitch of enthusiasm never excited at a lantern-slide exhibition, and seldom seen anywhere. Another record is a street scene, with two children dancing to the music from a hand organ. An actual street organ is played behind the curtain, and the whole effect is very real. In some instances the band of positive film is carefully coloured, and here the effect is truly lifelike. When it is remembered that there may be 5000 or 6000 positives to be tinted, it is seen that this colouring is no small undertaking. It is a peculiar fact that scenes from home life take better with the general public than more ambitious efforts. The record showing wash day at home aroused much more enthusiasm than an acrobatic trio or a regiment of soldiers. The projection of these images is not absolutely perfect, but this is due to slight imperfections in apparatus and to other causes, which experience will enable the operators to overcome. The chief trouble seems to be due to a slight vibration, causing a certain amount of blurring. The source of this trouble may be in the taking camera or in the projecting apparatus, or in both. The sprocket wheel, which engages the holes on each side of the band of films, seems to us a source of trouble, for the holes in the film must become elongated, causing the film to slip a little. Again, if the feeding is at all irregular, trouble must ensue. These, however, are little difficulties that mechanical ingenuity will master.

During the past month some trouble has been experienced during the development of these long rolls of film from frilling and reticulation. This has been partly overcome by using cool solutions; but, until the film itself was cooled, some trouble was always experienced. The camera being principally of metal, and being exposed for some considerable time to the

sun's heat, the film becomes quite warm, and the sudden immersion in ice-cold water is liable to prove disastrous. If the film is kept in a cool place for a few hours, developed and fixed in cold solutions, and washed with water that has passed through an ice tub, no trouble will be experienced. The expense attached to the making of a record is not inconsiderable, and in many cases duplication is not possible; every precaution is therefore necessary.

EXPERIMENTAL NOTES.

The old photographer used so often to fume his paper that it was considered worth while by some commercial houses to place fuming boxes on the market. Now that we no longer sensitise our own paper, but are content to buy P. O. P., fuming is no longer heard of, and probably there are many readers of the JOURNAL who have never fumed a piece of paper in their lives; yet it is, even with gelatine and collodion printing-out papers, a great help sometimes. Not only does fuming the paper make it print quicker, but for matt-surface papers which are destined to be toned with platinum, whether the vehicle be collodion or gelatine, the fuming produces far greater richness and depth in print.

I need hardly say how to fume paper, and the only precaution to be observed is, if gelatino-chloride paper be fumed, the negative must be varnished, or it will beget a goodly crop of silver stains, as the gelatine so readily absorbs the moisture. When exceptionally harsh negatives have to be printed from, there is a somewhat simple means which can be readily used by any one, with which considerable variation in the gradation of the resulting prints can be obtained. This is immersing the paper in a five per cent. solution of sodium phosphate for about one minute, or else passing a flat brush liberally charged with a ten per cent. solution of sodium phosphate over the surface; or more satisfactory even than this is a mixture of sodium phosphate and ammonium carbonate. After drying, the paper is practically about three times as sensitive; and the only difficulty is that it is so sensitive, and may print so flat, as to be practically useless, but this is only intended for very harsh negatives. Paper treated in this way will not keep, but must be used within three days.

If, however, as frequently happens, we have excessively thin flat negatives, such as are too often obtained with a hand camera, it is possible to so treat ordinary P. O. P. as to obtain exceedingly harsh contrasts, and this is by the use of a 2½ per cent. solution of potassium bichromate, and painting the surface of the paper with this. Considerable care has to be exercised in using it or the paper will be abnormally hard, and therefore utterly useless for all but the very weakest ghosts of negatives.

It may possibly not be out of place to point out how very rich deep tones, in fact with deeply printed matt papers, almost black tones, can be obtained by using the sulpho-cyanide bath if prepared in a particular way. Assuming that we wish to use the whole of a tube of gold, dissolve one ounce of potassium sulphocyanide in four ounces of distilled water and heat to 80° C., then dissolve the chloride of gold in four ounces of distilled water and heat to 80° C. and add gradually with constant stirring to the sulphocyanide solution and allow to cool. This, when diluted to the normal strength, will, if the prints are left in it till they appear grey, when examined by a transmitted light, with a faint red tinge in the shadows, be very nearly black on fixing. Bühler adds a quarter of an ounce of strontium chloride to the gold solution, but so far as I can see this has but little, if any, action on the toning powers of the bath.

Messrs. Abney and Lyonel Clark, in their book on "Platinotype," state on p. 64, that the sensitising solutions for platinotype paper will not keep long: "the solution will only keep in hot weather about ten minutes, or in cold weather perhaps twice as long." It would be interesting to learn how this fallacy has arisen. I am now experimenting with a mixture of ferric oxalate and chloro-platinite solution which was mixed fourteen days ago, and it is as good as when first mixed. In the presence of any organic matter, such as may be used for sizing, it will not keep more than about two hours, but the pure chemicals properly prepared *per se* will at least keep fourteen days, in the dark of course, although the bottle has been frequently opened and used from.

Whether anybody now wishes to make ferric oxalate or not, except, possibly, for experimental purposes, I do not know; but, after trying almost every method that has been recommended, I have found Weissenberger's a long way the most satisfactory with a slight alteration, the tip for which was learnt from Hübl. Powder up 52 grammes of ammonia iron alum, and place in a beaker about three inches diameter, ten inches high. Stick a little bit of paper on the outside of the beaker so as to mark the exact height of 85 cm., then place the powdered alum dry into the beaker and add to it with constant stirring 20 cm. of liquor ammoniæ and 10 cm. of water. Stir for five minutes, and then fill up the beaker with distilled water, stir, and allow the precipitate to settle, decant the supernatant liquid, and repeat the operation till there is no longer any smell of ammonia. The precipitate and the water it contains must not finally occupy more space than the 85 cm. mark, then add 21·5 grammes of pure oxalic acid, and stir. The peculiar greenish-yellow solution will readily form, and the total bulk should be made up to 100 cm. This is a capital method for quickly preparing a solution of ferric oxalate, the whole operation only taking about three hours, and, after filtering, it is ready for use.

There is, fortunately for platinotype workers, the satisfactory intensification process of gold, followed by metol, suggested by Dollond; but for those purists who will not admit this as satisfactory, but must deposit platinum on platinum, I can commend the process lately suggested by Hübl, which is simple and very easy of control. Five parts of a ten per cent. solution of sodium formate are mixed with five parts of a two per cent. solution of perchloride of platinum, not the chloro-platinite, and 100 parts of water. In this the image will steadily gain in intensity. This bath may also be used for negative intensification, and also transparency work, but there seems to be some little uncertainty about its action in these cases, probably due to the gelatine.

To those who, like myself, love to dabble in practical chemistry, the formation of barium or potassium platino-cyanide is not a difficult matter. In the first place, a stream of well-washed hydrogen sulphide should be passed through a solution of platinic chloride, heated to 60° C., the precipitated platinum sulphide well washed, and then dissolved in just sufficient warm solution of potassium cyanide, and on evaporating crystals of the platino-cyanide $K_2Pt(CN)_4\,3\,H_2O$ will be obtained—the mother liquor containing equal parts of potassium sulphide and thiocyanate. If, instead of the potassium cyanide, barium cyanide be used, the barium platino-cyanide will be obtained. It is essential that the potassium cyanide be pure, as many commercial samples contain a good deal of sodium cyanide.

Some question has arisen as to the poisonous properties of the thiocyanates, or, as they are usually called, the sulpho cyanates; and in one of the American papers great fun has been made of those who have stated that they are extremely 'poisonous.' Dr. Aarland has experimented, and found that he could take one gramme of ammonium sulphocyanide, usually termed in Germany 'rhodanammonium,' without any ill effects. The question still remains, however, whether one might not have hydrocyanic acid formed in the stomach with large doses.

Some attention has been directed lately by Liesegang in Germany, Haddon and Grundy, and Watkins, in England, as to the composition of the pyro-developed image, and they have satisfactorily proved that a colouring matter—the result of the oxidation of the reducing agent—forms an integral part of the image. To those who, having yellow-stained negatives, wish to get rid of this colour as far as possible, the by no means new idea of converting into a black compound may be recommended; and for this purpose the use of an iron salt will be found satisfactory, as was suggested some years back by B. J. Edwards, who recommended ferrous sulphate for this purpose. Possibly more satisfactory than this is the use of a solution of potassium ferric oxalate, slightly acidified with oxalic acid. The iron salt combines with the yellow oxidation product to practically form a black colouring matter very much akin to the old gall and iron writing ink. AND. LIGAU.

IMPORTANT PATENT CASE: SHEW *VERSUS* SOCIÉTÉ DES LUNETIERS. JUDGMENT.

A PATENT action brought by Perry (J. F. Shew & Co.) against the Société des Lunetiers for infringement of their patent "Eclipse" hand cameras and lenses, well known in photographic circles since their introduction in 1885, was tried before Mr. Justice Romer in July last, when judgment was reserved. Justice Romer, in delivering judgment on Monday, August 10, said:—

This patent has many difficulties in its way, but in my opinion it just manages to overcome them.

It is suggested on behalf of the defendants that the patent is really one of large scope, that it is not for an improvement on previously existing portable cameras for instantaneous work—not for a novel combination—but is for a portable camera for instantaneous work as an instrument previously unknown; I do not think that suggestion can be upheld. The claim in the complete specification as amended is carefully limited, and I ought not to depart from it merely because of the somewhat loose description of the invention at the heading, or of the object of the invention at page 2, lines 6 and 7, of the specification. Moreover, I do not think it was intended by the patentee to make so large a claim as is suggested, for the provisional specification (lines 1, 2, 5) limits the form.

of the invented portable camera for instantaneous purposes to one which has no loose parts. In considering the other objections, I must distinguish between the camera and lens. I will deal first with the camera. Its utility is not disputed. Its chief advantages over other previously known cameras of the kind are derived from the use of hinge-bound sides, which, when folded out, form a fixed holding for the camera front, and are so placed as to let the front get into position very speedily, and simply by a spring-like action.

Now, it is said that this spring-like action is not described in the body of the specification. But the specification refers to fig. 3, as showing the framework, and the witnesses are practically agreed that the spring-like action must come from what is clearly shown by that figure. So that, if you make the camera according to the invention as described, you must get the advantage in question, and I do not think that a patentee, who sufficiently shows what his patent instrument is and how it is to be made, is bound, as a matter of law, to specially point out all its advantages, or from what special parts of his instrument they are derived. But the defendant makes a further point. He says, admitting the claim is for he camera as a whole—that is to say, for a combination—yet, as a matter o flaw, when the claim is for a combination, the patentee must point out in his specification exactly what the novelty of the combination is, and claim only for that, and, in support of this, he refers to the case of *Foxwell v. Bostock*. But that case, and the authorities on which it is founded have been since explained by the Courts, and it has been pointed out that they really only amount to this, that, when a claim is made to a general combination is not new, but there is only an improvement in some part, then the patentee must point out and claim for the improvement, and not for the whole combination. If the claim is for a combination and the combination is a novelty (and I think that is the case in the patent before me), then the patentee need not point out how far he claims novelty for particular portions which go to make up the combination, see *Harrison v. Anderston Foundry Company*, 1 Appeal Cases, page 574, and *Proctor v. Bennis*, 36 Chancery Division, page 740.

The next objection taken is this: Advantage is taken of a phrase used by the witness James, and it is said that the amendment of the specification (page 2, line 18), by adding the words "and the action of the sides," has enlarged the claim originally made. But I think James, in his evidence, was really discussing the alleged anticipation called the Poleograph, and its cross-extensions, and that really the amendment has not enlarged or substantially altered the real claim, and I cannot see that this objection is raised by the particulars. The objection therefore fails, and I need not consider whether such an objection, if established, would now be fatal, having regard to what was said in the case of *Moser v. Marsden* in the House of Lords. A minor objection was raised, that the framework of the camera is not in any way held by the tension of the bellows body when extended (Specification, page 2, line 18). But, though the holding may not be very substantial, I think there is some holding, especially if the top did not fit very closely.

It is further said that the patent has been anticipated, but the alleged anticipations, in my opinion, substantially differ from the patentee's invention, and have not its special advantages pointed out above. The Scenograph and Poleograph, for example, and the camera shown in the *Bulletin of the Association Belge de Photographie*, have not the hinge-bound sides or the spring catch, which give those special advantages.

The stereograph in evidence would have been nearer, but that has not been proved to my satisfaction. The camera produced comes from abroad for the purposes of this action, and there is no evidence of that camera itself having been used here before the date of the patent.

The witness Lechertier, who spoke to it, could only say that he had in his shop that kind of camera. He was an artist's colourman, and only sold, as agent for another house, this kind of camera as a small part of his general business, and I do not think his experience in cameras, or attention to his camera branch of business, was such as to enable me to depend on his evidence as to the details of the camera he sold; and in any case, if the cameras he sold were like the exhibit in kind, the defendants have certainly not proved to my satisfaction that they had a spring catch or had hinge-bound sides when placed in position so as to be effectual, or hinge-bound in a true sense, according to the plaintiff's invention.

It only remains for me to consider the question, Whether there was sufficient improvement or novelty in the invention to support the plaintiff's patent, having regard to the then existing knowledge? I think, on the whole, there was, although the invention cannot be regarded as an important one. I think there was an advance and improvement on prior portable instantaneous cameras, which was by no means obvious, and required invention sufficient to support the patent. I have not dealt with all the substantial objections taken before me with regard to the camera.

I must now consider the claims with regard to the lens, that is to say for the instantaneous shutter operating as described in the specification. The only special objections relied on before me were that the invention had been anticipated, and was not good subject-matter of a patent. In my opinion these objections fail. I think the peculiar arrangement of the spring, and the way in which the shutter was operated on by it was ingenious and novel, and was an advance and improvement on the previously existing knowledge sufficient to support the patent.

With regard to the alleged anticipations, I need only refer to (*a*) the Lens Exhibit W. J. L1 (sometimes referred to as the Lancaster or D lens), and (*b*) the shutter called Andrea's. As to (*a*), I think there are substantial differences between it and the plaintiff's. In (*a*) there is only an indiarubber acting for a spring, and this, being elastic, is not so sure or compact as the plaintiff's spring, and the difference of adjustment is not unimportant; and, moreover, the elastic is not coiled round the body of the lens as the plaintiff's spring is. As to (*b*), what is shown by the description and figure in the article in THE BRITISH JOURNAL OF PHOTOGRAPHY differs in so many ways from the plaintiff's that I need not deal with it in detail. But there is in the article a suggestion to change the string and spring shown in the figure for a true watch spring on the axis. The author, however, has not shown clearly what he means by the suggestion or how to carry it out, and Mr. Lancaster, who gave evidence for the defendants, and was himself an expert on the subject, when asked to show how to work the suggestion out, was obliged to acknowledge that he could not do so. Moreover, the plaintiff's spring is not a mere watch spring, and is coiled round the body of the lens and not round the axis of the revolving diaphragm as suggested by the article in question, and I do not think a person reading the article would naturally be led to the plaintiff's invention. The plaintiff's invention has advantages as to the ease and accuracy with which the exposure to the light is provided for, not possessed by the alleged prior inventions.

I ought, perhaps, to add that, with regard to the lens, the defendants raised a similar objection to that raised by them with regard to the camera, namely, that the patentee was bound to point out in his specification exactly what was new and what was old. But I need not repeat what I have above said as to the camera, and, indeed, with regard to the lens, the patentee does sufficiently point out by his claim that the arrangement of the adjustable spring was regarded as new. I have now dealt with all the substantial objections to the patent taken before me, and, as they fail, and infringement is not really disputed, it follows that the plaintiff is entitled to the usual relief.

Mr. Eve: We ask, my Lord, for a certificate, if your Lordship pleases, as to the validity.

Mr. Justice Romer: Yes.

Mr. Eve: And of proof of the breaches.

Mr. Justice Romer: Yes.

Mr. Eve: And then we ask also for delivery up of the infringing cameras and the shutters, and for the usual inquiry as to damages.

Mr. Justice Romer: Yes, you are entitled to that.

THE PHOTOGRAPHIC CHART OF THE HEAVENS.

WE are indebted to our contemporary, *Nature*, for the following:—

At the fourth meetiug of the International Committee of the Carte du Ciel, which took place at the Paris Observatory in May, under the presidency of M. Tisserand, the following members were present: MM. Anguiano, Bailland, Bakhuyzen, Christie, Donner, Duner, Gill, Henry (Paul), Henry (Prosper), Loewy, Rayet, Ricco, Trépied, Turner, Viniegra. There were also present, at the invitation of the Permanent Committee, MM. Abney, Backlund, Bouguet de la Grye, Callandreau, Common, Corun, Downing, Fabre, Faye, Gautier (P.), Jacoby, Knobel, Laïs, Laussedat, Newcomb, Perrotin, Scheiner, Stephan, Wolf.

Of the eighteen observatories associated for the production of the Carte du Ciel, thirteen were represented. The directors of the five other observatories, MM. Russell (Sydney), Baracchi (Melbourne), Obrecht Santiago), Cruls (Rio Janeiro), Beuf (La Plata), were prevented from attending by great distance or by professional duties.

The following officers were elected: President, M. Tisserand; Vice-Presidents, MM. Bakhuyzen and Gill; Secretaries, MM. Donner and Trépied.

The following resolutions were adopted:—

I.—PHOTOGRAPHIC CATALOGUE.

1. The Committee is of opinion that the probable error of the value of the rectilinear co-ordinates measured on the plates should be reduced to the smallest possible limits, and that the measurements must be directed in such a way that this probable error shall never exceed 0″·20.

2. (*a*) The Committee think it necessary to publish the rectilinear co-ordinates of the photographed stars as soon as possible.

(*b*) It is desirable that this publication should include the necessary information for the conversion of the results into equatorial co-ordinates.

(*c*) The Committee desires that a provisional catalogue of right ascensions and declinations should be published by those observatories which have sufficient funds at their disposal.

3. Each observatory will be at liberty to choose the positions of the comparison stars in the catalogues which seem to them most suitable. For the calculation of the constants of a plate, a minimum of ten comparison stars should be adopted if possible. The adopted positions of these comparison stars will be published.

4. The question of determining whether, for the reduction of the stars to 1900, it would be advisable to adopt a uniform system of constants for the observatories, will be the subject of a subsequent discussion.

5. The Committee recommends the adoption of a uniform size of publication for all the observatories; the size should be that of the volumes of the catalogue of the Paris Observatory.

6. The observatories will be at liberty to determine the photographic magnitudes either by measurements or by estimation. The only con-

dition which the Committee think it necessary to impose is, that the system of photographic magnitudes on which the measures or estimations depend, should allow of a precise definition, so that the different scales used in the different observatories can be reduced to a common system.

II.—The Photographic Chart.

7. Every observatory will be provided with a scale of density, which will be printed on the plates at the same time as the *réseau*, and which will permit the determination of the sensibility of each plate for luminous sources of different intensities.

Captain Abney is charged by the Committee with the construction of the scales.

8. For the construction of the chart, the second series of negatives (that is to say, those of which the centres have odd numbers for their declinations) will be made in three exposures, each lasting thirty minutes. This time of exposure may, of course, be reduced if an increase of the sensibility of the photographic plates be secured.

9. The Committee allows photogravure on copper as a means of reproducing the chart. The negatives to be exposed three times, and enlarged to twice the original size.

10. The observatories will make two positives on glass by contact, one of which will be placed in the Pavillon de Breteuil, the headquarters of the International Bureau of Weights and Measures.

11. The Committee defers till the next meeting the examination of the measures which it may be necessary to take with the object of assisting those observatories which may anticipate a difficulty in completing their programme.

The meetings of the Committee were marked with the greatest cordiality, and with the desire to carry to the end the great work undertaken in common; the decisions, prepared by special sub-Committees, were passed unanimously by the members present.

The conference was followed by a *soirée* on Saturday, May 16, and by a dinner given the next day (Sunday, May 17), in the large gallery of the Observatory, at which the following were present:—MM. Ramoaud, Minister of Public Instruction; Bertrand and Berthelot, Permanent Secretaries of the Academy of Sciences; Cornu and Chatin, President and Vice-President of the Academy; the members of the Committee, and numerous visitors belonging to the Academy, the Bureau des Longitudes, the Council of the Observatory, and the *personnel* of the establishment. Professor Backlund, Dr. Downing and Professor Newcomb, members of Conference on fundamental stars, were also present.

POSTERS AND PHOTOGRAPHS.

[The Studio.]

If you set out to advertise certain things for sale, it is no use to do so in a modest, retiring way. Audacity and arrogance befit a placard, and if the man in the street jeers at blue-haired maidens, or emerald green skies, do not assume too hastily that the artist who employs them has blundered. There are many ways of attracting notice, and eccentricity is by no means a reprehensible quality in advertising. The difficulty is to be eccentric and yet to keep within the bounds of good taste. But a few years ago the damozel beloved of the Burne-Jones school would have stood no chance of finding favour in the eyes of those who advertise. Now she is the popular heroine of the moment. That she will stay so for long is neither likely nor entirely to be desired; but, inasmuch as the idea which governs conventional decoration is thereby advanced a step, one does not grudge her her hour of popular applause; for to-day, when the photographer bids fair to infect the masses with his erroneous belief that direct imitation is the end of art, it is good that in ways which appeal to the million a totally opposite doctrine should be preached. To "press a button," nay, even to "do the rest" oneself, is not necessarily to become the peer of Rembrandt or Titian, nor even of a poster designer. The bold camera-wielder claims to be the perfect draughtsman, he laughs to scorn the simplified drawing of the decorative school, the while he despises the stippled finish of the old miniaturist. As well might a maker of mirrors proclaim himself a greater painter than Reynolds; undoubtedly he reflects more of the person that gazes into his looking glasses than any artist ever set down; neither the fleeting reflection, nor the image chemically retained, have aught to do with drawing, and the ideal they exalt is not one essentially connected with art.

Gleeson White.

THE ENAMEL PROCESS ON COPPER AND ZINC.

[Eder's Jahrbuch.]

During my last year's visit to Germany, France, and England, for purposes of study, I observed that in many places efforts were being made to take advantage of the well-known American copper enamel process for the production of zinc process plates. It delighted me to co-operate in these efforts, and upon my return to Vienna I took the matter in hand.

It was at once evident to me that, in applying the process to zinc, an essential modification was necessary, principally on account of the fact that zinc will not stand so high a degree of heat as copper. How far this circumstance would influence the principal foundation of the process was still unknown to me. But to every operator it must be clear that a workable, reliable process for zinc, similar to the enamel process, must possess high practical value. Not only is zinc five times cheaper than copper, but such a process would be a considerable improvement in comparison with the asphalt or transfer methods in regard to quality and quickness of production.

All my experiments were carried out, both on copper and on zinc, and comprised reproductions of oil paintings, water colours, Indian ink, and charcoal drawings, also phototypes of various line drawings. Concerning the photographic process adopted, the following may be noted:—

The exposures were made exclusively by electric light (6000 candle power), and on wet collodion. For the colour subjects Dr. Albert's isochromatic collodion was used in conjunction with a yellow screen. The other exposures were made with a twenty per cent. bromo-iodised collodion. The sensitising bath was a solution of nitrate of silver 1 in 12, and the developer a two per cent. solution of iron and copper. The first intensifier consisted of 5000 parts water, 180 parts sulphate of iron, 90 parts citric acid, and a few drops of a 1 in 12 solution of nitrate of silver. Fixing: Cyanide of potassium solution 1 in 20. The negatives were blackened with chloride of gold, 1 part in 2000 parts of water, and 10 parts of hyposulphite of soda. The lens was a Zeiss Anastigmat, type *f*-9, focus 690 mm., the largest circular stop No. 128=68 mm., the smallest No. 2=8 mm. diameter.

For the process negatives, an etched, cemented, cross screen, by Levy, with fifty-three lines to the centimetre, was used. The distance of screen from plate was, as a rule, 4 mm., but, with flat subjects, 7 to 8 mm. distance was given. The exposures were made with two stops, namely, with No. 2 or 4, for about one-third the time, and with No. 32 or 64 for the remainder.

The total exposure was from six to ten minutes, according to subject. The negatives were reversed in the following manner: The negative was coated with plain collodion, dried, the edges lifted with a needle and then immersed in a dish of clean water. In about ten minutes the film floated off, was taken up on a stiff sheet of paper, and transferred to a glass plate coated with gelatine. The negatives were of good density, and with clear glass. No retouching was done.

After I had made several experiments with various sorts of commercial fish glue, which, on account of their valuable properties in respect of consistency and chemical impurities, led frequently to unsatisfactory results and rendered the process uncertain, I at last fixed upon the receipt of Professor Valenta, of the Vienna Technical Institute, which is a preparation of Cologne glue. According to the same, 100 grammes of good Cologne glue are soaked for twelve hours in 600 c. c. of water, and then melted in a water bath; 3 grammes of dry egg albumen are then dissolved in a little water, added to the glue solution, and the temperature raised to 100° C. for fifteen minutes on a water bath. Filter and allow to cool; 60 c. c. of this solution are then mixed with 3·5 grammes of dry egg albumen dissolved in 30 c. c. of water, and to this is added in the dark 30 c. c. of a ten per cent. solution of bichromate of ammonium. Again filter the solution. According to my experince, this solution may be kept three or four days in a dark, cool room.

Before coating, the zinc and copper plates were cleaned with alcohol and moderately warmed. A sufficient quantity of the sensitised solution was then poured upon the plate in the same way as coating glass with collodion. The plate was then transferred to the whirler, which had previously held a warmed lithograph stone. It was then whirled until dry, which usually takes from four to five minutes.

As dust is a very troublesome companion in this manipulation, I cover the plate with a hood of cardboard. At each of the four corners of the plate I place a small piece of blotting-paper, which absorbs the solution thrown off by the whirler. Printing was done by daylight only, and took forty-five to sixty seconds in the sun, and five to eight minutes in the shade, according to the light, on very dull days up to fifteen minutes was necessary.

The development was first done in clean water, and took thirty to forty seconds. To ascertain clearly the degree of development, I then bathed the plate in a solution of new Victoria green, prepared by the Badische Anilin and Soda Fabric. If the development be correct, the plate is washed under a spray, again stained with the dye, and allowed to dry spontaneously. All the detail can now be seen upon the plate in an intense green colour, and every plate that has failed can be at once cleaned off without burning in.

For burning in I use a long gas-heater with an iron plate, 1 centimetre thick, on the top. With full pressure of gas a heat is evolved exceeding the melting point of bismuth (264° C.), and below the melting point of thallium (290° C.). I conclude that the heat must be about 270° to 280° C. By lowering the gas I can reduce the heat below the melting point of tin (280° C.). The developed plate is placed upon the plate of iron, and the following changes are observable: Rather below 150° C. the colouring matter disappears, and the film begins to appear yellowish, it then passes to light brown, and with full power of gas, in about three minutes, turns to a chocolate brown. The image on these burnt-in copper plates I have found a complete protection against any solution of chloride of iron, until the process plate is full etched, and, of course, without any further preparation. But this did not concern me much, as this process is well known. My object was to employ a bichromated glue process that would be more trustworthy and simple than any other.

But, of course, it was, above all, necessary to keep in view that the structure of the zinc in producing the enamel should not be injured, which would infallibly be the case if the temperature were raised as high as with a copper plate, to reach the dark brown stage in the film of glue. I thought that I might attain this, perhaps, for practical purposes, without producing an enamel.

After many failures, I arrived at the following result:—The bichromated glue picture on zinc was developed and stained, as already described, and then laid upon the iron plate of the gas-heater. Somewhat below 150° C. the colouring matter disappears; at the melting point of Sandarak (about 150° C.) the film turns somewhat yellow, and at this point the zinc plate is removed. (In future I shall so arrange the gas-heater for hardening the film on zinc plates so that the iron plate cannot exceed a temperature of 150° C.). The film has now attained a condition in which it can withstand a first etching with 400 grammes of alcohol (forty per cent.) and 5 grammes of chemically pure nitric acid. According to subject, the strength of image, and degree of development, the etching should last from three to five minutes. As soon as all details in the shadows are plainly visible, clear and open, and the etching is sufficiently deep to permit of the plate being rolled up, the first etching is stopped. The plate is then washed with water, gummed, and dried. It is then treated with a soft, wet sponge, rolled up with fatty ink, dusted with finely powdered dragon's blood, and the latter is then fixed by heat. The second etching is with a two to three per cent. water etching solution, and lasts about five minutes. The plate is again washed, and once more placed in the above-mentioned alcohol etching solution for two to three minutes. With correct exposure and development, the entire etching of a process plate of quarto size does not take more than thirty to forty minutes. The plates are sharp and clean, and faultless prints can be made from them in the Schnell press. In the reproduction of line drawings the first etching is done in the same way, and the final etching after the usual manner for line work.

I may remark, in addition, that, if much over-exposed or too little developed, the plate may be etched with the alcohol bath, strengthened by addition of 1 to 2 grammes of acid. If, in much over-exposed plates, the details in the shadows still fail to appear, the plate may be laid in a one to one-and-a-half per cent. water etching bath for a minute or two, in which all detail will come up. With much over-exposed copper plates I have obtained good results in the following manner:—The enamelling is stopped when the film turns brown, and the plate immersed one to one and a half minutes in a chloride of iron solution, 40° B. It is then washed, and the burning-in is carried to the dark-brown stage, when it is at once finished in a chloride of iron solution, 40 to 45° B. I have also fully burnt-in at once, and then etched, first with a 35° bath, and finished with a 42 to 45° solution. The results were quite satisfactory. Much over-exposed plates can also be developed in warm water at 18° to 20° C. I have also observed that the above-mentioned bichromate of glue formula answered admirably for copper plates, but, if the same consistency upon zinc plates, it gave trouble in development. This was obviated by adding twenty-five per cent. of water. I think this may be explained by the fact that the copper plates have a much more homogeneous surface, whilst the somewhat porous nature of the zinc retains too much of the glue, and the film becomes too thick.

With reference to the production of enamel on copper plates, I have found that, in using Cologne glue, as well as other sorts of commercial fish glue, the plate should not be heated above 280° C. for production of the enamel. At the melting point of bismuth the uncovered portions of the copper plate become as white as silver, and the film brown; the film then gradually turns dark brown, and the copper assumes a reddish hue. By further heating to the melting point of lead, the plate begins to oxidise. The film of enamel begins to peel, and at last flies off.

If, in my experiments, I have contributed a small addition to the elucidation of this subject, and have given a useful hint in working out this bichromated glue process on zinc, I shall be satisfied. I must, however, expressly state that, like others, I have failed in producing an enamel process on zinc, as it is understood with copper; but I believe that the bichromated glue process on zinc is of practical value, worked in this simple and reliable way.

G. Fritz.

DEATH OF MR. WILLIAM ENGLAND.

We are sorry to have to announce the death of Mr. William England, which occurred a few days ago, at the age of sixty-six. The deceased gentleman had a long association with photography, which he took up in the Daguerreotype days. In later times he acquired a well-deserved reputation for his landscape work, and was renowned for his Alpine views, which for a long time remained unapproached. Some of his instantaneous street scenes, taken, we believe, so long ago as the year 1858, are not excelled even at the present day. Mr. England may be described as one of the old school of photographers, the ranks of which are rapidly thinning, and he was universally esteemed. In former times, as our back volumes testify, he made many contributions to technical photographic knowledge. For many years he was a member of Council of the Royal Photographic Society, of which he was a warm supporter, and at whose exhibitions he was a frequent exhibitor.

News and Notes.

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, August 26. The subject for discussion will be, *The Best Basis for Judging at Photographic Exhibitions.* Visitors are welcome.

Leytonstone Camera Club.—The Hon. Secretary writes: "I regret to inform you that the studio of the Leytonstone Camera Club was destroyed by fire on the night of August 10, including the whole of the Club property. Fortunately the latter was fully insured. Would you be kind enough to intimate that, whilst arrangements are being made for new premises, all communications should be addressed to the Hon. Secretary, 110, Windsor-road, Forest Gate, E.

Soldering glass by means of a metal solder has become a possibility through a recent discovery of an alloy, composed of ninety-five parts of tin and five of zinc, which melts at a low temperature and will firmly adhere to glass. Another alloy of tin and aluminium, containing ten parts of the latter, melts at 390°, and can be used also for soldering glass. Either of these alloys can be cast upon glass without danger of breaking the glass if it has been previously heated slowly. Castings of these alloys made on glass become firmly adherent, as much so as though they were made on metal.

When the Princess of Wales intends to visit the photographers, says a contemporary, she usually arranges that her sitting shall take place in the morning. A special studio is set apart for the Princess and other members of the Royal Family. It is approached by a private door, which leads to an ante-room provided with easy-chairs and a plentiful supply of illustrated papers. A small chamber is fitted up as a dressing-room, and here is to be found a maid from Marlborough House, who, has preceded her Royal mistress with a dressing-case containing all toilet requisites. The Princess, having decided on the position in which she wishes to be taken, arranges herself. It is etiquette on these occasions for the photographer to address any remark he may have to make to the lady-in-waiting in attendance, who in turn addresses the Princess, who replies through her.

Photometry of Coloured Lights.—An ingenious and simple method of comparing the luminosities of differently coloured lights is described by Frank P. Whitman in the *Physical Review* of recent issue. The principle on which Whitman's photometer is founded is due to Professor Rood. Rood prepared about fifty grey discs, differing successively in depth of tint from black to white. If a dark shade was combined with a light shade in the usual way, and rotated rather slowly, the familiar unpleasant sensation known as a "flicker" was produced; but, if successive pairs, more and more nearly alike, were chosen, the flicker became less, until it almost, or quite, disappeared. Nearly the same effect was produced if, instead of a grey, some other colour was substituted on one of the discs. It was always possible to combine with a grey disc of such a shade that the flicker nearly ceased, showing that this sensation is apparently independent of the wave-lengths of the lights compared, and dependent only on the relative luminosities. In Whitman's instrument, a coloured card and a white card are alternately exhibited to the eye of the observer. These cards are illuminated by lights of different intensities placed at opposite ends of a graduated photometer bar. By moving the support on which the cards are fixed along the photometer bar, a point is reached at which the "flicker" ceases. At this point the illumination of the white disc or card is taken to be equal to that of the coloured card, and the relative intensity of the sources of light can be calculated. Of course, instead of a coloured card, a coloured light may be subjected to measurement. This instrument is said to give results quite as good as are obtained when two lights of the same colour are compared by the ordinary photometer.—*Scientific American.*

Photography in Colours at Newquay.—Mr. G. G. Bullmore writes to our Newquay contemporary, whose remarks we quoted last week: "I have read with interest your reply to my challenge in this matter, and much regret to note that Mr. Bennetto regards my letter 'as based on the implication that he does not speak the truth.' I wish emphatically to disabuse his mind of any such intention on my part, as my challenge was addressed to yourselves, and I have not yet heard from Mr. Bennetto, privately or publicly, that *he* claims to have discovered 'photography in colours of nature by purely photographic means.' I was under the impression that your article, 'A Grand Discovery by a Newquay Photographer,' in your issue of the 24th ult., was based upon error, and embodied your own ideas and impressions. Seeing that a large amount of scepticism has always been manifested on this subject, you will, I think, forgive me if I considered that your good selves are scarcely qualified to give an expert opinion. The reasons of my friend and myself holding such a view may be summed by the following extracts from an article on 'Photography in Colours,' published in *Chambers's Journal* of May 9 last, wherein the writer makes the following statement: 'Again and again has it been asserted that the problem of photography in the colours of nature was solved. Companies have been formed to purchase secrets which were known only to one man, who recognised the value of that commercial doctrine which teaches that where there is a demand a supply is sure to follow. Within the past twenty years half a dozen such projects have been brought before public notice, people have believed in them, and have invested their money in them, but we are still as far from photography in colours of nature as were Daguerre and his contemporary workers of half a century back.' After stating that 'advances have been made in the better rendering of coloured objects,' he proceeds as follows: 'But all this progress in the art, satisfactory though it be, brings it no nearer the solution of the problem of photography in the colour of nature. True it is that there are many methods by which photographs are printed in colours, and very effective some of these pictures are, but they employ coloured inks or pigments of some kind, and, although they have a photographic foundation, it would be false to describe them as photographs in colour.' I wish further to state that I appreciate Mr. Bennetto's scruples on the question of its being a 'common street bet,' but I cannot plead guilty to

the offence, and nothing was further from my mind. Personally I do not consider I was justified in declining to accept the deposit of the twenty guineas for the benefit of a public institution under the conditions named. I note that you have not furnished me with the names of the 'leading scientists and distinguished persons' who have seen the results and 'declared them marvellous.' Had you done so, and I had found amongst them men whose judgment I can trust in such a matter, the twenty guineas would have been forthcoming without further trouble. Seeing that Mr. Bennetto has not denied or qualified your statement, but has, through you, taken the matter up personally, my friend is prepared to pay the sum of *fifty* guineas against yours, or Mr. Bennetto's twenty-five guineas, upon the conditions laid down in my letter published in your issue of the 31st ult.; and permit me to hope that you will endeavour to overcome Mr. Bennetto's scruples, and that you will appeal to Mr. Bennetto, who must take a deep interest in the welfare of the town, to obtain for its benefit the substantial sum now offered by my friend. After reading the articles in THE BRITISH JOURNAL OF PHOTOGRAPHY on *Photography in Colours in the Lantern*, Mr. Bennetto will scarcely ask the referee to accept that mode of demonstration."

Patent News.

THE following applications for Patents were made between August 5 and August 12, 1896:—

CLEANING PLATES.—No. 17,185. "An Improved Method of and Apparatus for Cleaning and Preparing Photographic Plates and Films." B. J. EDWARDS.

MOUNTING.—No. 17,189. "Improvements in or relating to the Method of and Means and Appliances for Mounting Drawings, Photographs, Stamps, Etchings, and the like in Albums, Mounts, and analogous Articles." H. J. JOHNSTON-LAVIS.

FOLDING CAMERAS.—No. 17,217. "Improvements in Folding Photographic Cameras." W. W. BEASLEY.

EMBOSSING.—No. 17,225. "Improvement in the Method of Embossing Photographs." Complete specification. F. A. TABER.

STEREOSCOPIC APPARATUS.—No. 17,388. "Process and Apparatus for Taking and Reproducing Photographs with Stereoscopic Effect." T. J. PERRETT.

CAMERAS.—No. 17,505. "Improvements in or relating to Photographic Cameras or Film-exposing Apparatus." T. H. BLAIR.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
24	North Middlesex	Demonstration by the Autocopyist Co.
25	Birmingham Photo. Society	The President (Sir J. Benjamin Stone, M.P.) will attend to Distribute the Medals and Certificates gained at the Annual Exhibition.
25	Hackney	Open Night and Demonstration.
26	Photographic Club	The Best Basis for Judging at Photographic Exhibitions.
29	Birmingham Photo. Society	Excursion: Worcester. Leader, G. A. Thomasun.
29	Borough Polytechnic	Excursion: Barnes and Richmond.
29	Croydon Camera Club	Excursion: Greenwich. Leader, W. H. Rogers.
29	Croydon Microscopical	Conversational Meeting and Excursion Results.
29	Darwen	Excursion: Bull Hill and Moor. Leader, J. W. Smith.
29	Leytonstone	Excursion: St. Margaret's. Leader, G. Campbell.
29	South London	Excursion: Kew and Richmond. Leader, M. Boxall.

PHOTOGRAPHIC CLUB.

AUGUST 12,—Mr. J. E. Hodd in the chair.

Mr. J. S. LANE, an American gentleman touring in Europe, and who had previously been a visitor to the Club, was present. He stated that since his last visit he had been to Madeira, the Cape, and the Transvaal. He was in Johannesburg at the time of the dynamite explosion, and got some pictures within a few hours of that event. He referred to the very great difference in the actinic power of the light here and in South Africa. He found the light there stronger, in a photographic sense, than it was in the United States. Among other interesting items mentioned by this visitor was a method which he employed to utilise dark-room lamps fitted with a candle and actuated by a spring. He said that, by wrapping a rag or duster soaked in cold water around the lamp and the socket containing the candle, he was enabled to prevent the candle becoming soft, and being pushed through the top of the lamp.

Mr. Tottem showed an album of prints. The pictures were printed upon matt Solio paper, and were toned with platinum in accordance with the Eastman Company's printed instructions. The pictures were excellent, both in an artistic and technical sense.

Being an Open Night, the meeting became of a conversational order. Mr. Hodd gave further details and particulars of some dark slides which possessed the characteristics of producing foggy marks upon plates which were left in them for any length of time. These marks were of an uncertain origin. Apparently, they were produced where the shutter of the slide was hinged, but sometimes the marks were light and sometimes dark. There was no obvious connexion between them and the light outside the slide. They were equally noticeable when the slide and the plate it contained were kept in the dark room. Every one to whom he had related the particulars had a theory which accounted for the trouble. The explanations, however, were all different. Mr. Hodd promised to send up some of his experimental results to the next meeting of the Club. Having once started the question of photographic troubles and mishaps, every member had a full budget of disasters and experiences to relate.

Mr. Lane promised to bring up to the Club some of the results which he had obtained upon his recent tour, and Mr. Charters White wrote stating that Mr. Noel Cox had kindly promised to give the Club a Travellers' Night during the approaching winter session.

Hackney Photographic Society.—August 11, Mr. W. Rawlings presiding.—Several new books were added to the library, making considerably over 200 books. The evening was set apart for the few remarks on Multiple-coated Plates by Mr. SANDELL, who said the anti-halation powers of these plates were not all that was claimed for them, as they would, in a great measure, make over-exposure almost an impossibility. Many questions were asked, to which Mr. Sandell replied. The speed of the various films on the plates were as follows:—Top, extreme rapidity; second, medium; third, slow lantern plate. He had not adopted the Hurter & Driffield method. The top film would, for rapidity, compare with any in the market. He advocated the use of metol as a developer. In hot weather, it was better to use the alum bath. Some experiments were made of plates having had exposures varying from half a second to thirty-two seconds, and were successfully developed in the same dish. A great number of prints were passed round and bore out the inventor's claim of the anti-halation powers of the plates.

South Australian Photographic Society.—The Annual Meeting of the South Australian Photographic Society was held at the Chamber of Manufactures on Thursday evening, July 9. Mr. E. W. Belcher presided. Miss Perryman was elected a member, and four nominations were received. Mr. Clough and Mr. Stace showed specimens of work for criticism. The programme for the coming year was read by the SECRETARY, also the eleventh annual report, which contained the following:—"The number of members on the roll is now sixty-nine. Seventeen new members were elected during the year, three resigned, and three were struck off for non-payment of subscription. Two slight alterations of the rules were made, one to provide for two Vice-Presidents, and the other to make Librarian also Assistant Secretary. During the year the Secretary and Librarian resigned their offices, and these positions have since been filled by Mr. J. Gazard and Mr. J. D. Dixon. The Society's stock of apparatus, &c., has received the addition of two table gas lamps, a strong box for storing the Society's papers, &c., and portable bookshelves. The library has been further extended by the addition of fifteen books, besides periodicals, the total number of volumes on the catalogue now being eighty-two. A complete rearrangement of the library has just been made, all the books procurable having been called in and renumbered. During the year eleven ordinary and ten committee meetings have been held. The attendances have been very satisfactory, and the specimens of work shown by members for criticism have been numerous, and some of exceptional merit. The annual *conversazione* was held in the Victoria Hall on September 12. It was largely attended, and proved a complete success. On February 29 an excursion was made to Mount Barker at the kind invitation of the Hon. Dr. Cockburn. This is the fifth year in succession that the Society has benefited by the doctor's kindness. On this occasion over twenty members accepted the invitation, and spent a thoroughly enjoyable day. The Society contributed to the success of the Mayor's *conversazione* in November by an excellent display of photographs and apparatus." The Treasurer read his annual statement, which showed a good credit balance. The report and balance-sheet were unanimously adopted. The retiring President, Mr. E. W. Belcher, delivered the annual address, and made reference to the progress of photography, the discoveries of the year, and the future of the art. The election of officers for the ensuing year resulted as follows:—*Patrons:* Sir Thomas Fowell Buxton, Bart., K.C.M.G., Hon. Sir E. T. Smith, K.C.M.G., M.L.C., Hon. Dr. Cockburn, M.P., Professor E. H. Rennie, M.A., D.Sc., Professor W. H. Bragg, M.A., and Mr. J. J. Green.—*President:* Mr. A. W. Dobbie.—*Vice-Presidents:* Messrs. A. Scott, B.A., and A. H. Kingsborough.—*Committee:* The executive officers and Messrs. C. F. Clough, A. W. Marshall, and S. P. Bond.—*Hon. Librarian and Assistant Secretary:* Mr. J. D. Dixon.—*Auditors:* Messrs. C. Radcliffe and Kerr.—*Hon. Treasurer:* Mr. R. B. Adamson.—*Hon. Secretary:* Mr. J. Gazard. A hearty vote of thanks was accorded to the retiring President; also to the Treasurer for his seven years' services.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

OPACITY OF WET AND DRY NEGATIVES.

To the EDITORS.

GENTLEMEN,—I am very pleased to see that at least one of your readers has taken an interest in the question of different densities of wet *versus* dry gelatino-bromide plates.

The experiment he has suggested is certainly an interesting one, and I venture to think that very little difference will be found between the

density of the stained gelatine, wet or dry; of course, water absorbs a certain amount of light, but that will not account for the difference manifested in a gelatino-bromide plate. I rather suspect that the arrangement of molecules of the silver bromide has much to answer for.

Another matter bearing on this subject is the fact that a gelatine negative, when dried, after the application of alcohol, is more intense. This is easily proved by cutting a negative in twain (one that has not been dried), treat one half to a dose of alcohol, then allow both to dry spontaneously. Rapid drying by heat increases density. Opaque substances, as a rule, when mixed with a large quantity of transparent vehicle, lose a good deal of their opacity. Bromide of silver seems to be one of the exceptions. If I double the quantity of gelatine to a given amount of silver bromide, I get more speed. I account for this by the greater separation of the solid or semi-opaque matter.

Again, if I take a negative that is just surface-dry, and place it over the fumes of a strong solution of cyanide of potassium, the image will disappear entirely if left long enough. Where has the silver gone, or in what state is it? Certainly not visible, and no subsequent intensification will bring it up as it was originally. A glance along the surface will show that, where the negative has been exposed to the fumes, it is more glossy, leading one to imagine that the silver is evanescent. Apologising for taking up so much of your space, and thanks to your Capri correspondent.—I am, yours, &c., A. L. HENDERSON.

277, *Lewisham High-road, S.E.*

THE HYPO FIXING BATH.

To the EDITORS.

GENTLEMEN,—Your correspondent, "Alpha" asks me to state what, in my opinion, is a suitable strength for a hypo fixing bath. For negatives I consider one part by weight of hypo to five parts of water suitable; temperature, 60° Fahr.; and time ten to twelve minutes. For gelatino-chloride prints I like my solution weaker, say, one part to seven or eight; temperature, 55° Fahr.; time fifteen minutes. I usually alkalise my fixing bath with ammonia, because the ammonia bottle (ten per cent. solution) is to hand; but any alkali will do, and, in fact, ammonia is better kept away from gold-toned prints unless they are well washed.—I am, yours, &c., ANDREW PRINGLE.

THE POISONS ACT.

To the EDITORS.

GENTLEMEN, I have just read the letter of your correspondent, Mr. Wm. Hampson. In spite of his wrathful assertions to the contrary, even pharmaceutical chemists are sometimes as ignorant on some points as you asserted. Not so very long ago, I was told by a chemist that bicarbonate and carbonate of soda were practically the same thing. I don't know what may be the difference, from a drug point of view, but, I know, any one using them indiscriminately in a toning bath, would soon find something wrong. To be calmly told, when one wants *bicarbonate*, that *carbonate* will do, and is practically the same thing, is quite enough to make one doubt the infallibility of even pharmaceutical chemists.—I am, yours, &c., C. H. HEWITT.

Catherine-terrace, Gateshead-on-Tyne, August 15, 1896.

ART AND PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—In answer to several inquiries since my letter, "Art *versus* Photography"—which should, I think, be Art and Photography—I will forward on my book, to those who have applied, as soon as printed; and, beautiful and charming as photography is, yet, on passing many photographers' windows, there is a tendency to gloom, which the art of the photographer should eradicate. I know it is the tendency of several processes, and, until one puts them side by side with other works, we do not appreciate the loss. If photographers could use their pencils as well as their cameras, they would realise more what Professor Lully says. Few who have not endeavoured to draw and paint a daisy or primrose dream what exquisite symmetry of design, what tender enchantments of melting tint will baffle them in the task that appears so easy; yet even with the vast majority, who will partially or entirely fail, the time will not be in any way lost which had been given to preliminary lessons in drawing. They would have acquired, what is so good to have, a new conviction of their own shortcomings of sense and observation; they would have perceived, as nothing else could so teach them, the wonderful variety and perfection of the natural world, and the absolute inexhaustibility of its stores of beauty and instruction.

I will write again when my stress of work is somewhat over, if I can arrange it, to see if some of you might explain more fully—for "things seen have more power than things heard."—I am, yours, &c., JOHN BOOL.

86, *Warwick-street, Belgravia, S.W., August* 17, 1896.

COLES' CAMERA FRONT.

To the EDITORS.

GENTLEMEN,—I am glad to notice in your last number that the Photographic Club have sent a contradiction to their reports appearing in the JOURNALS of January 17 and February 7, that the lens-carrier which Mr. Hare presented to them as an experimental one (and which, by the way, was not intended for the camera) was in any way like Mr. Coles' camera front, which, instead of only being fit for a club museum of relics, is a complete practical success.

I think it a pity that more care was not taken with the report, as it is entirely misleading to those who trust to the reports of the leading London clubs as to the value of new inventions.

The value of this camera was shown at the Royal Photographic Society at the exhibition of the lantern stereoscope, and, at another London Society; the discussion was entirely in favour of the front as being vastly superior to anything gone before. One has only to use it to find hitherto unknown comfort in working, being free from the restrictions of fronts which will not rise at a short focus.—I am, yours, &c., H. C. RAPSON.

11, *Shaftesbury-road, Hornsey Rise, N., August* 17, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Arthur Simmons, 258, Westminster Bridge-road.—*Two photographs of cricket match at the Oval, England v. Australia.*

RECEIVED.—Cadett & Neall; Percy Lund & Co.; J. Lewis; "Background" "Mercury"; "Electric;" and others. In our next.

F. WAREN.—Thanks; you will observe we have utilised the extract.

PLASTER CASTS.—F. E. G. We should advise you to send the casts to a maker of such things.

DIRECTORY OF PHOTOGRAPHERS.—ANNIE WOOD. Messrs. Percy Lund & Co., Bradford, publish such a work.

PYRO STAINS.—J. W. We fear the stains are not easily removed, but the cautious use of solution of alum and hydrochloric acid, oxalic acid, or alum and citric acid, might answer.

LENS.—PITT & SON. Sorry it is against our rules to answer questions such as yours. We should advise you to consult the catalogues of makers of repute; but we should be pleased to help you, if possible, on any specific point.

VENICE TURPENTINE.—M. CONNOR. Venice turpentine is kept by most oilmen who make a speciality of varnishes, also by most drysalters. We should not, however, recommend you to add any of it to the varnish you name. Instead of improving it, you will be doing just the reverse.

GASOLINE.—S. W. DIGBY. The *Ironmonger* is clearly under a misapprehension. The material is not used in any way in photography. We should say that the best sources to apply for it would be some of the petroleum refiners. Wherever it is supplied from, we suspect there will be difficulties as to carrying restrictions.

DAMAGED BACKGROUND.—J. MOORE. We strongly suspect that you will not be able to get rid of the stains caused by the rain coming through the roof, now that the background is dry, except by having it redistempered. If, while the background was still wet with the rain, it had been thoroughly wetted all over with a water can, the probability is that it would have dried without showing any trace of injury.

EXPIRED COPYRIGHT.—The copyright in the engravings has expired long ago, and they are very scarce now. If you make lantern slides from the original engravings, you will be all right. That may not be the case, however, if you make slides from any of the modern reproductions of them, of which there are several. There may be a copyright in the different reproductions, though there is none in the originals.

LEAKY ROOF.—S. SIMCOE. Yours is no uncommon experience after such heat as we have had during the summer. However, as the studio was only built in the spring, we should surmise that a couple of coats of paint, on the outside, will make the roof waterproof again—that is, provided the best materials were used in its construction. We should advise you to consult the builder who erected the studio in the matter.

RESIDUES.—WASTE says: "Some time ago you suggested putting the gold bath (sulphocyanide) with the used hypo baths, but I do not think you mentioned the method by which you propose the gold and silver should be thrown down together. Must I add liver of sulphur and sulphate of iron also? I shall be obliged for an answer in the usual place. I have been putting these baths together for some time in a lead-lined trough, formerly used for washing prints."—Liver of sulphur alone is sufficient. If the baths have been standing long in the leaden vessel, we should suspect that the precious metals, or a large proportion of them, are already reduced to the metallic state by contact with the lead.

*** Many answers to correspondents unavoidably held over

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OUR FORTHCOMING ALMANAC.

The time of year has arrived when it is necessary for us to take in hand the preparation of The British Journal Photographic Almanac for 1897. A feature of the volume for the past thirty years has been the co-operation of numerous friends and readers of the Journal, and the Editor takes the opportunity to express the hope that the support so kindly placed at the disposal of his predecessors may be continued to him.

We especially invite contributions on topics of practical interest, and should feel obliged if the articles and any accompanying sketches are sent to us at the earliest possible date.

Secretaries of Societies, and especially of those established since the appearance of the last Almanac, will oblige us by forwarding lists of officers and other details for inclusion in the Directory of Photographic Societies, in order that the list may be made as complete as possible.

The Publishers wish us to remind intending advertisers that the announcement pages of the Almanac are already filling rapidly, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

Mr. Byrne, of Richmond, is good enough to send us a copy of a circular he has received from a well-known firm of diarists, who, in referring to an almanac they are about to publish, say: "In it we are placing a coupon, on presentation of which at certain photographers' throughout Great Britain the bearer will be entitled to one cabinet portrait free of charge, and shall be pleased to add your name to the list, which will cost you nothing, on the understanding that you will honour any of the said coupons that may be presented before the end of 1897. As in every instance other copies will undoubtedly be ordered, and further business result, this must prove a splendid advertisement for you. We only appoint one photographer in each district, so shall be glad to hear from you per return."

* * *

We are not astonished to be told by Mr. Byrne that he declines to entertain the proposition. The firm certainly offer photographers a free advertisement, although some may think it is not one by which they are likely to profit, either in money or reputation. The presence of a photographer's name in the list may not inform the public in so many words that he has agreed to take photographs for nothing; but, as he is to depend for his profit upon the copies that will "undoubtedly (?) be ordered," it would be a very dense sitter who did not straight away see through the arrangement. It remains to be seen whether the firm's offer is one to commend itself to the favourable consideration of photographers of any class or standing, but the idea all through strikes us as being hardly calculated to advance the interests of the photographer although it may benefit a book such as the authors of the circular are advertising.

* * *

We are informed that the National Research Society has awarded its gold medal to the London Stereoscopic Company for practical demonstrations connected with the application of the Röntgen rays to surgical diagnosis. The Company, who were early in the field with practical radiographic work, deserve the medal; but we should be glad if any of our readers would oblige us with some information respecting the National Research Society, of which, we must admit, we never before heard.

Messrs. Whittaker & Co., of Paternoster-square, send us the programme of the Technological Examinations for the Session 1896–97, held by the City and Guilds of London Institute. It is a volume of over 300 pages, price 10*d.*, and it need hardly be said that photography finds a place among the subjects treated of. In another part of the Journal we give the syllabus of next year's examination, as well as the questions set at that which was held last May. The questions set in the photo-mechanical branch strike us as difficult to improve on; but we think that those selected for ordinary photography are here and there open to objection. As an example, the Artigue process, of which it is sought to test candidates' knowledge, amuses some half-dozen dilettanti photographers, but is scarcely likely to win serious consideration as a printing method, and we are, therefore, at a loss to know why it was thought necessary to refer to it.

* * *

There were other questions set in this — the Honours— grade that assumed a degree of knowledge on the part of the candidates which they were hardly likely to possess. For instance, they were asked to describe the composition and manufacture of celluloid as used as a support for gelatine emulsion. The text-books tell what celluloid *is*, but, as it is not, we believe, manufactured in this country for emulsion purposes, the part of the question that asked for information on that point is practically impossible to answer.

* * *

"The causes of the phenomenon known as the reversal of the image" are not yet precisely understood; at any rate, we are safe in saying that our foremost scientific investigators who have studied the phenomenon are not agreed as to the causes, so that the question is one to which none but speculative replies could be given. If it is customary for examiners to set questions that do not admit of definite answers, we would suggest the abandonment of the practice, inasmuch as, the object of the examination being presumably to test the candidate's knowledge of *practical* photography, the introduction of matters of disputed theory is superfluous. We may note, in conclusion, that the candidates were asked to describe "the" process of producing burnt-in enamels on porcelain. The candidates would be quite entitled to rejoin, "Which one?" There is more than one such process; but the ways of examiners are difficult to comprehend, a conclusion to which most of us were driven comparatively early in life.

PRINTSELLERS' PHOTOGRAPHS.

By this title we would wish to be understood as referring to the photographs adapted for exhibiting for sale in the printseller's shop, in contradistinction to those produced in the usual routine of the professional photographer's studio to his sitters' orders. It may be that to many the term will be meaningless, that it will suggest nothing in the way of business or of profit. But things were not always thus. The pioneers of popular portraits for the million could tell the present generation of photographers of orders that would be well-nigh incredible. It is on record that, in the early days of the *carte-de-visite*, when popular characters were to be seen exhibited in every print-shop window in the kingdom—and were, moreover, sold quickly at 1*s.* 6*d.* a piece, and were to be seen in almost every album in the kingdom—it is on record that an order for a hundred thousand copies of Her Majesty was placed in Mr. Mayall's hands: a hundred thousand *cartes*, invoiced possibly at 9*s.* or 10*s.* per dozen, and printed from wet-plate negatives without any retouching, twelve repeat portraits on each plate! We are now writing of a period of upwards of three decades ago, when it was actually the fashionable thing to be photographed, and fill one's album as quickly as possible with an equal proportion of friends and of public characters. Gradually, however, the craze—for such, indeed, it was—subsided, till it was once more given a fresh lease of existence in a different direction, portraits of pretty popular actresses and singers being chiefly in demand. After a while, when this fashion had had its day—Soho-square could give a good account of the millions of pictures sown broadcast from its distributing centre—the popular fancy was for portraits of society belles, which had such an immense run that it was reported that some of them were paid large sums for the privilege of photographing them, and a new slang expression was adopted into the language of the day—"professional beauties" these sitters were termed. It was said that they were as well paid as the actresses, to one of whom—Mrs. Rousby, in "'Twixt Axe and Crown"—it was currently rumoured that no less than 200*l.* was paid for the sole privilege of photographing her and selling her portraits.

Since that time, with a few exceptions, the sale for this class of picture, with a few occasional brilliant exceptions, has fallen lower and lower, till, we opine, an order for a hundred pounds' worth of copies of one negative would be looked upon as something quite out of the common.

It will naturally be asked, "How has all this come about?" The answer is easy to find. It is twofold: first, the cessation of a particular popular craze; and secondly, and most important, the invention of the ruled screen for process blocks. There is no doubt about the matter, the increased facilities offered for multiplication by the process block, and its quick adoption by the press, has scotched, if not killed, the business of popular character selling.

Time was when, if any one took an interest in a particular person or place, he would go to the nearest print shop and buy a photograph; nowadays, however, he says, "I will wait till I get my Saturday's illustrated paper, it will be sure to contain it." Quite recently we were in a well-known photographer's studio, and we heard a client say, while admiring a new portrait just issued, "Oh, I will wait till Saturday, when it will be in my paper, and I shall cut it out and frame it." This is nothing but a bald narration of fact, and the only question that can arise out of it is, "What is the remedy?" We know of none, and, even when there is a sale, prices are cut so low as to leave little margin for profit. There is, however, one palliative, and that is from the *fons et origo mali* itself, the illustrated papers themselves. Any one can see for himself what a poor show the weekly illustrateds would be without photographs reproduced by "process" or actual wood-engravings. Of this source of profit less use is made than might be. These papers must have illustrations and photographs to base them on; it behoves the photographer, with his eyes open, to lose no chance of securing a negative of every person, every event, every place, which for the moment is occupying public attention, and to get a print off at once to the most suitable paper. They will all accept and pay for such pictures; but speed is the very essence of the profit to be reaped. If a man becomes famous at the end of the week, there will be no demand for his portrait for the papers after

the first day of the very next week. Every one who aims at making money this way must bear in mind that the Saturday editions of these papers go to press Tuesday or Wednesday, and that some time, brief though it be, is needed to get a process block ready. In a general way, Saturday is the latest, though, for specially attractive and popular subjects, Monday may possibly be in time. The publishers then are just willing, when there is a legitimate copyright, to pay a fair price, its extent being governed by the demand for, or the rarity of, the subject photographed; but the photographer must be in time.

Last Saturday's papers offer a good example of what we mean. We have, of course, no means of ascertaining what the photographers received, but we note that portraits of Li Hung Chang, at Hawarden, on Saturday, and at Windermere, on Sunday, appear in the papers published last week, so that the plates must have been exposed, and developed, and printed from the day they were taken, and sent off the same day to London, care being taken meanwhile to make them copyright. The next step is, of course, to make the most of the negative, either locally, or, if it be of general interest, through the usual channels of publication. Here, however, will be found a woful contrast to the halcyon days we have alluded to. The best advice we can give is, Be open and fair with the papers—they are willing to give fair prices, governed, as we have said, by the subject itself—and above all, to be quick to put the goods on the market, lest they be a "day behind the fair," when their value for paper illustration purposes would be *nil*.

Li Hung Chang.—The Chinese Envoy, who has been the "lion" of Europe for some time past, has left for the States. Disappointment has been expressed on the Continent and here that he has not left business orders with any of the manufacturers whose works he has visited, although the "goods" shown him have been displayed to the best advantage. However, a few photographers have profited by his visit. While in Germany, he was photographed together with that veteran statesman, Prince Bismarck, and while in England with Lord Salisbury and also with Mr. Gladstone, two of the greatest statesmen, though of opposite politics, of this country. All these photographs have been reproduced in the illustrated press, and have proved a source of considerable profit to the photographers who took them, and will, doubtless, continue to do so for some time to come.

M. Andrée's Balloon Expedition.—Last week we commented on the conflicting telegrams received during the past few weeks as to this enterprise, such as, that the wind was unfavourable when everything was ready; that the wind was favourable, and that a start had probably been made; that the balloon was damaged; that it was supposed to have been sighted, &c. At last we have a telegram, dated Christiania, August 21, which is, doubtless, reliable. It is to the effect that, when Dr. Nansen's vessel, the *Fram*, visited Dane's Land, M. Andrée stated that the season was now too far advanced to make the ascent this year, and that he should leave Spitzbergen on the 20th inst. (Thursday last). It may be remembered that, when this expedition was first mooted, much doubt was expressed amongst scientific men and geographers as to the practicability of the hazardous undertaking, and, so far, they have proved correct. We shall see what comes of it next year. Many are of opinion that M. Andrée is safer now than he would have been if he were on his perilous voyage.

Stratford-on-Avon.—Last season, and this, the London and North-Western Railway and the Great Western have been running half-day excursions at a very cheap rate to Shakespeare's country, of which many photographers have availed themselves, as will, no doubt, many more. The fare for the double journey is but three shillings and sixpence, and allows a stay of over four hours. What we wish to call special attention to is that the former railway company gives a sketch map of the district on the back of their handbills, showing the route to be taken to see all the places of interest in the shortest time, as well as the times to get from place to place. No photographer, who visits Stratford for the first time, should fail to take one of these with him, as it will save him much loss of time, and perhaps avoid sundry "tips" to the natives. The example set by the L. & N. W. would well be followed by other companies who run such trips, as often those who avail themselves of them, particularly those with cameras, waste a deal of time in finding the places they are most desirous of seeing.

Return of Dr. Nansen's "Fram."—The ship, *Fram*, which Dr. Nansen and Lieutenant Johansen left frozen in the ice in March 1895, has arrived safely home with all well aboard. It is curious that Dr. Nansen and his vessel, after so long a parting, should arrive back within a few days of each other. It is stated that the lowest temperature experienced was about fifty degrees below zero, and the greatest depth of sea ascertained was 2185 fathoms. Dr. Nansen says that those on board the *Fram* had plenty of amusements, and well they needed them in their ice-bound quarters. We mentioned last week that Dr. Nansen and Lieutenant Johansen must have had a rough time of it on their way back; but they have no cause to complain, since, of the reception they have met with from all sides. They have been fêted and feasted with the greatest enthusiasm, and their ship was received with the greatest honours from all the other vessels in the neighbourhood. Although Dr. Nansen failed to reach the pole, yet he has got the credit of having got nearer to it than any previous explorer.

The Recent Eclipse of the Sun.—At the time of writing last week there was nothing to chronicle with reference to the different eclipse expeditions but the more or less failures—more rather than less—particularly the scientific-cum-pleasure one to Norway, on account of the weather. It is gratifying, however, to learn from later telegrams that the same has not been the case everywhere. A telegram from Hammerfest says that Sir George Baden-Powell's yacht *Otaria* had arrived there with the members of the British Eclipse Expedition, and that the party had, in Nova Zembla, secured some very satisfactory photographs. A telegram from St. Petersburg says that, with regard to the observations of the eclipse on the Amur, the sky was overcast at the time, but six photographs were taken illustrating the different phases of the eclipse. A later telegram from Russia says that the expedition sent to the North of Finland experienced magnificent weather, and it obtained ten good photographs of the corona with three different apparatus. So, after all, some satisfactory and valuable results have been secured, though the Norwegian expeditions, in connexion with which the most elaborate preparations were made, were barren.

A Society of Miniature Painters.—Miniature painting is likely to receive a fresh impetus by the formation of a Society of Miniature Painters, who intend to hold an inaugural Exhibition at the Gallery, 175, New Bond-street, about the middle of next month, under the auspices of several R.A.'s and other well-known artists. The members of the Society are to be limited to fifty professional artists. The Exhibition is to include not only portraits but miniature subject pictures not exceeding 12 × 10 inches dimensions. There is no question that miniature painting has been on the decline for many years past, indeed ever since the advent of photography. We are, of course, alluding more particularly to the "Miss La Creevy" style of portrait, which, as a matter of fact, may be said to be now about as extinct as the old *silhouette* black paper portrait. Photography practically killed both. Miniature pictures on ivory are, however, still done, and of sufficient merit to find a place in the annual Exhibitions of the Royal Academy, though they may not be quite up to the standard of a Cosway, a Sir William Newton, and others; but we hope that the new Society will be the means of developing work of a similar character to theirs.

By the way, has the colouring of photographs become a lost art? We mean the high-class work that used to be done thirty or more years ago by Lock and other artists of equal talent. That high class of work seems to have now become quite extinct. This, in some measure, may be due to the fact that the base upon which the work was put—the silver print—proved evanescent. Some prints, upon which several guineas had been spent in the colouring, were found to undergo a wonderful change after a few years. That need not be the case now; but we very much question if any large proportion of the public would pay from five to ten guineas for a coloured photograph, less than the cabinet size, if artists were forthcoming to give full art value for the money.

ORTHOCHROMATIC COLLODION EMULSION FOR PROCESS WORK.

Having recently been obliged to make half-tone negatives from a number of rather highly coloured drawings, and finding that the necessity of making first an ordinary negative upon an orthochromatic plate, and from this a silver print, and then the half-tone negative somewhat too tedious a job, I determined to try my hand at preparing collodion emulsion plates, and sensitising them myself, and, after considerable failure, success attended my efforts at last, and the following notes may be useful to other process workers.

As I knew that on the Continent an ortho emulsion, made by Dr. Albert, was used by many process workers, I first tried this, but, either from my ignorance of how to work it properly or some other cause, I did not find it quite satisfactory, there being a tendency to fogginess and want of clearness in the half-tone negative which was fatal for block-making. I therefore set to work to make my own, using the formula originally sketched out by Hübl.

Schering's celloidin was chosen for the pyroxyline, more because I knew it better than anything else, and absolute alcohol and methylated ether; but I soon found that, as the emulsion had to be precipitated and washed, the use of absolute alcohol was rather costly, so the old-fashioned methylated spirit 64 o.p. was used to make the emulsion in the first place.

The method of preparation was as follows:—352 grains of silver nitrate were dissolved by boiling in 3 drachms of distilled water, and sufficient strong solution of ammonia cautiously added till a perfectly clear solution was obtained. To this solution was added 2 ounces of methylated spirit, and the whole allowed to cool, and then added to 9 ounces of collodion, made by dissolving 175 grains of celloidin in 9 ounces of methylated alcohol and ether. The addition of the silver causes a slight cloudiness, partly due to separation of the celloidin and partly to some of the silver being thrown out; but, if the mixture is well shaken, it clears up somewhat.

The bromising solution is made by dissolving 244 grains of ammonium bromide in 3 drachms of water and 6 drachms of methylated alcohol by the aid of heat, and, whilst still warm, this is added to the silver and collodion in four or five lots, shaking between each addition. When all has been added, the bottle should be shaken well for at least ten minutes, and then distilled water should be added, in small quantities at a time, shaking between each addition, till the whole of the emulsion has separated out, and this can readily be detected, as, on standing, the emulsion collects together, leaving the clear liquid. The emulsion is now poured on to a double thickness of nainsook, the ends of the same collected in a bag, and tied together round a stick, and suspended in a beaker of distilled water to wash, the water being changed three times in fifteen minutes. It should then be allowed to drain well, and gently squeezed, to free it as much as possible from water, and then dipped into methylated alcohol three times, to still further remove the water, and then either well squeezed, or, as I prefer to, sling the bag at arm's length, and thus get rid as much as possible of the spirit.

The emulsion must not be completely dried, but whilst still damp dissolved in a pint of alcohol and ether, this time absolute alcohol being used to dissolve it. To the solution should be added four and a half grains of narcotine, and the whole allowed to stand at least a week to ripen, shaking it frequently.

To sensitise this for colours is a simple matter, although it takes a little time to prepare the solution; but, having once prepared it, or rather the silver eoside, it may be kept indefinitely in the dark. 10 grains of eosine G should be dissolved in ¾ ounce of boiling water, and to this added 5 grains of silver nitrate dissolved in 1 drachm of water. Allow the precipitate to settle, filter, and wash the filter with boiling water till the washing water is strongly coloured, and then with alcohol, and dry in the dark. Collect the dry silver coside, and keep in the dark.

The sensitising solution is prepared by dissolving 20 grains of the dry silver eoside in 2½ ounces of absolute alcohol to which ammonia is added. The best way to do this is to heat the mixture of alcohol and eoside, and drop the ammonia in very gradually, when the eoside will dissolve; then add 10 ounces of alcohol and sufficient glacial acetic acid to neutralise any free ammonia. The acid must be added cautiously. Two ounces of this dye solution should be added to every pint of collodion, and this quantity of alcohol should be omitted.

The coloured emulsion should be well shaken, then allowed to rest for about five minutes, and then the plates coated and dried at a temperature of 15°C. Hübl recommends their being, when dry, heated for some minutes to a temperature of 30°C., and this, apparently, about doubles the sensitiveness; but, so far as my work is concerned, I have found that, without this supplementary heating, the plates are very little, if any, slower than ordinary wet collodion, and, when using them with a fairly deep yellow screen, the colour rendering is decidedly satisfactory.

The best developer for these plates is glycin, and the formula I use is the following:—

A.

Glycin	½ ounce.
Sodium sulphite	1¼ ounces.
Water	10 „

B.

Potassium carbonate	2½ ounces.
Water	10 „

For use, mix in equal parts. Unless in cases of over-exposure, no bromide is necessary.

After fixation—and I prefer for this the much-decried hypo—the negative should be well washed and dried, and, if necessary, reduced to clear up the dots, and for this I prefer ferridcyanide and hypo; but possibly this may be due to the fact that cyanide in any form always affects my head.

For intensification, I have entirely abandoned pyro and silver, preferring metol, as it gives a cleaner image. The metol intensifier is, of course, much on the same lines as the old pyro, in two solutions:—

Metol	15 grains.
Citric acid	10 „
Water	2 ounces.

The negative is first flooded with this till the film is thoroughly saturated, and then the metol solution poured off and one-tenth of its volume of ten per cent. silver nitrate solution added, and the whole returned to the plate and allowed to act till the desired intensity is obtained.

The above process may seem troublesome, but it is really very easy, and the negatives are all that can be desired, and are quick printers.

A. D. Pretzl.

A COMPARISON OF ORTHOCHROMATIC WITH ORDINARY PLATES.

II.

Writing, as explained in my former article, for the ordinary photographer rather than for the experimentalist or specialist, I shall, as far as possible, keep clear of such side issues as do not seem to bear somewhat directly upon ordinary work. In this I am in the main following Mr. White.

One of the strongest points bearing upon practical photography which Mr. White's experiments seem to emphasise is the comparative inutility of employing isochromatic plates unless a long exposure and dense screen are employed. Pairs of exposures were made upon a colour chart (which together with representative prints selected from several scores of negatives specially made by Mr. White have been left for inspection at the office of this paper) by means of ordinary plates and colour-sensitive ones respectively. Before me are results of one, four, and sixteen inches of magnesium wire burnt during three sets of exposures. The resulting renderings of each pair are very much alike, the improvement in colour rendering becoming more pronounced as the exposure was lengthened. The slight divergencies noticeable in the renderings between the two categories of plates indicate that, although neither approached nearer to theoretical perfection much more than the other, the shortcomings were merely different in their character.

Next as to the influence of screens.

Mr. White, in the first instance, tried the following thicknesses of Ilford screens, which he numbered 1 to 5:—

Screen 1	Ilford	No. 1.
„ 2	„	No. 2.
„ 3	„	Nos. 1 and 2.
„ 4	„	Nos. 2 and 2.
„ 5	„	Nos. 2 and 2, Nos. 1 and 1.

Exposing ordinary and orthochromatic three inches of magnesium at *f*-16 with screen 1, the difference between the two is so slight as to be hardly worth mentioning; the undue predominance of blue rays is painfully noticeable in both, whilst neither renders the proper brilliancy of tone due to the lighter yellows and allied tints. Using nine inches of magnesium with screen 2, there is some slight improvement in the blue, but not much. Thirty-six inches of magnesium with screen 3 gives a rendering in which all colours are nearly of identical tone value. One hundred and four inches of magnesium with screen 4 gives a result which is perhaps as near to perfection as any of the series; but, remembering that the normal exposure as usually calculated was equivalent to one inch of magnesium, it will be seen that, even were we to allow that the last conditions were those best calculated to ensure faithful colour rendering, such would be quite outside the range of ordinary photography as practised for profit or pleasure, for neither in the studio nor in the field would the average photographer for a moment entertain the notion of increasing exposure a hundredfold. Hence the foregoing experiments, in so far as they teach anything, would seem, in my opinion, to point to the absolute futility of using colour-corrected dry plates for all ordinary purposes.

Using No. 5 screen and doubling the exposure of the last exhibits phenomena due to over-correction. Signal green forty-eight magnesium, *f*-16, gives a singularly monotonous rendering of colours which, if indicative of how a landscape of colour, or the rose, apricot, and amethyst of a pretty face would come, inclines one to vow never to use this doleful colour filter. Better the lively lies about blue and yellow than such humdrum quaker tones, which would apparently represent the wings of Iris by means of a leaden grey. This last opinion has only references to the picturesque photography of scenery, and so forth, where absolute truth—never as yet possible—is quite secondary in its importance to effect. Any how the green screen, in so far as it exaggerates the darkness of the scarlets, which negatives never render too light, is no nearer truth than no screen at all.

Thus far, Mr. White's investigations lead him to the conclusion that, while no glass screen that he tested interposed between the object and the dry plate is absolutely effective in correcting inaccurate colour rendering, the best result he could obtain needed a double thickness of Ilford screen No. 2. and an exposure about a hundredfold what is required where an ordinary result on an ordinary plate is aimed at.

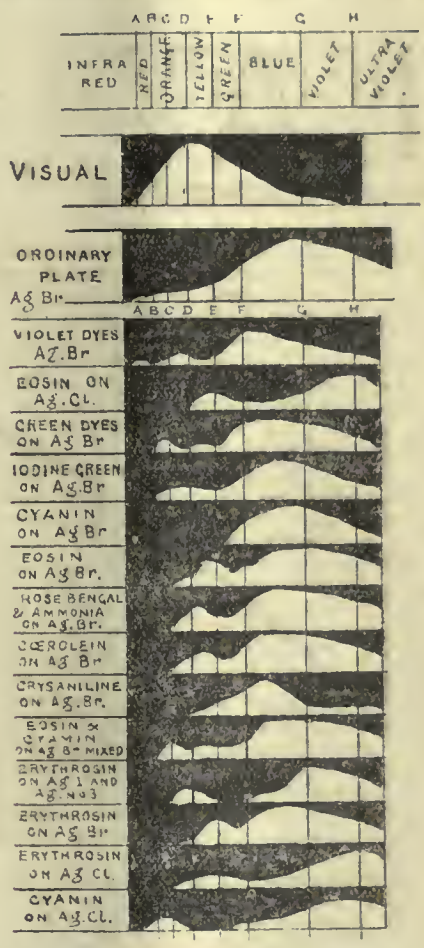
One other point, which is, perhaps, more important to most people than whether a given plate gives fifty or forty-five per cent. of a particular colour brightness in a landscape, or similar subject, is that Mr. White found—what others before have more or less emphatically stated—that the employment of screens—especially dark ones—has a most objectionable lowering effect upon the subject. A dark screen knocks all the brightness, the sparkle, and crispness out of the negative; it seems that whatever is gained in truth of colour is much more than lost by the inadequate light and shadow rendering, and by the flatness of modelling which ensues. The practical man will understand the kind of difference when it is likened to the falling away in brilliancy which happens where a double lens is employed instead of a single landscape lens; only with these dark screens the mischief is much more pronounced.

In looking at the various prints which Mr. White took of his colour chart, one cannot help but be struck by the reiteration of that, as far as I am aware, not fully explained manifestation in virtue of which the photographic effect of colours varies according to their surroundings. Mr. White's chart has, besides a painted kind of spectrum, three strips, which are respectively white, grey, and black; on each of these have been painted four discs, coloured red, yellow, blue, and dark green. The effect of the three different-toned backgrounds upon the rendering of colour values is at times most remarkable; for instance, whereas most of the photographs of the yellow on white show it as palpably darker than blue, the *same prints* show yellow on black as nearly as light as blue, the difference being hardly distinguishable; from which it will appear how fallacious arguments may be which are based upon particular colour charts.*

* See, for example, Mr. Ives's charts in vol. xx. of *Photographic Journal*.

Having taken my readers so far, it will perhaps be as well to proceed a few steps further and bring to their notice a collection of diagrams which Eder, Bothamley, Abney, Vogel, and others, have made to graphically indicate what are the respective amounts of colour sensitiveness in various plates which have been specially treated.

An attentive examination of these diagrams cannot fail to impress upon the observer that with all its faults the ordinary plate is quite as valuable and useful as any single one of the dyed plates represented. The plates thus modified exhibit such a strange, not to say forbidding, erraticism, as would make thoughtful individuals little



inclined to depend upon them. Take that one treated with cyanine; here all light from A to B (that is red, orange, and yellow) is eliminated. Rose Bengal certainly helps to render the due intensity of yellow, but from A to C is quite cut off, while there is a woeful falling away between E and F (green).

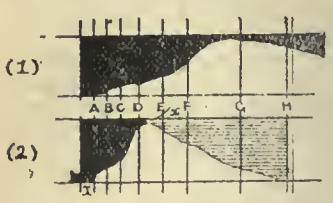
Perhaps most in favour is the mixture of eosine and cyanine, which indicates a tolerably satisfactory scale of sensitiveness. At the same time, although this is particularly sensitive between B and C, the sensitiveness does not extend beyond B to A. Moreover, compared with the ordinary plate, there does not appear to be that great difference from D to E (yellow) which one might expect.

The diagrams, taken as a whole, seem to indicate that, to a large extent, the main action of the different dyes has been *not* to increase defective sensitiveness, but to reduce the redundant action of the too active portions of the spectrum—a result which is, moreover, not infrequently accompanied by the elimination or the diminution of portions of the radiant energy, which we can ill afford to spare.

A reference to the diagrams relating to the visual manifestation of sunlight, and the photographic rendering upon an ordinary photographic plate will indicate why there is much force in Mr. White's contention that, providing full exposure and a dark screen be used, the ordinary plate may be made to record, with quite as much perfection as any other at present known, what are, substantially, the colour values of the spectrum as judged by the average eye.

The visual intensity of light increases rather suddenly from A

to D, whereas the photographic rendering is far too gradual; but, by sufficiently increasing the actinic influence of the light upon the plate instead of the curve being normal it may be represented as by x in diagram 2; one obvious effect of doing this is to very grossly increase the energy of the spectrum from E to H. By interposing a dense screen, as already mentioned, the superfluous light action is, theoretically, reducible until the photographic and visual curves are identical, or nearly so.



Reverting to more practical matters connected with the question, if Mr. White's contention as to the considerable injury caused by the interposition of a dark screen between a view and its image be not over-stated, it is evident that, as at present used, screens are not to be thought of. But with their rejection it by no means follows that correct colouring is in all cases hopeless; for, of course, the objection which is raised to a screen does not hold good with the utilisation of light in which blue and violet is less than usually predominant.

Thus magnesium, gas light, electric lights, and other variously tinted lights, all have their peculiarities, it being perfectly possible, under the most favourable circumstances, by employing a suitable illuminant, to make the visual and photographic effects coincide.

In this usage of artificial light to cut down a considerable proportion of the light energy between E and H, many photographers are inclined to imagine that, roughly speaking, all artificial lights of similar visual appearance have practically the same effect. Such is not the case; hence, and where a specially sensitised or dyed plate is used, the best effect will be obtained when the artificial light is so chosen that it yields a maximum of energy of rays belonging to that part of the spectrum which the plate used is least sensitive to, and proportionately less in the remaining parts of the spectrum.

All who possess a reasonable experience in outdoor photography will know how that Nature at times has a very happy trick of placing a colour screen of her own between one's camera and the scene to be depicted. Such is most often the case towards sundown, but sometimes may occur in broad daylight, when, moreover, there are but faint indications, if any, of such inclination to yellowness of light as we might expect. What is the precise cause of the occasional meteorological manifestations alluded to in the preceding paragraph it is not easy to explain, nor can one always recognise its presence until the negative tells us that the occasion was eminently favourable for the due intensities of half-tones to be accompanied by not over-dense clouds, and other high-lights. In such cases we are specially advised to use orthochromatic or dyed plates; but, if Mr. White's contentions are sound, nothing is needed beyond a slight increase of exposure.

In the application of photography to the copying of such works of art as have colours which have to be translated, Mr. White does not consider dyed plates are called for, except where the colour scheme is unusually pronounced and full of great contrasts. Thus, pictures whose effects are mainly composed of two or three adjacent portions of the spectrum can be as well copied on an ordinary plate as on any other. Where there is any departure from the ordinary plate, it would seem from Table I. that there is much range in the various dyes applicable to the preparation of plates for photographing particular pictures.

Thus, old pictures which are much yellowed by age may be considered as copied behind a screen which greatly over-corrects the original colour values; such a picture usually suffers by the almost complete suppression of blue and other cool tints. To photograph such a work with a plate specially sensitive to yellow (C to E) obviously intensifies the evil, an ordinary plate giving far the better rendering. Probably cyanine on Ag.Cl. (not Ag.Br.) would, however, in such a case as hypothesised yield the best result.

This paper has, I fear, somewhat degenerated into gossip, but is, I hope, not on that account less accurate than many of the dry-as-dust order, which many people either do not care to read or fail to grasp. Those who would wish to become further acquainted with the latest opinions upon the subject will find suggestive matter in a paper by Mr. F. E. Ives, published in *Transactions of the Royal Photographic Society* for April, 1896, and in the report of Captain Abney's lecture in May at the Society of Arts. By the way, Mr. Ives, in speaking of screens, *emphatically* condemns one which has been for years recommended. The screen referred to is the *aurine* one, which Mr. Ives opines is "worse than no screen at all." According to the same authority, great things in colour rendering are possible on ordinary plates, using a combination of chrysoline and brilliant yellow.

From Mr. White's experiments, and other arguments advanced in this communication, it would seem that ordinary plates used with screens may produce results superior to some makes of dyed plates; that it would be very advantageous if plate-makers would mark their boxes of plates with a diagrammatical indication of the plate's relative colour sensitiveness; perhaps not less useful would be the statement as to what dye and other chemicals are used in altering the ordinary range of sensitiveness of the silver emulsion.

HECTOR MACLEAN, F.R.P.S.

FOREIGN NEWS AND NOTES.

Shutters.—We are not surprised to see Dr. Krügner's statements concerning the roller-blind shutter challenged. We summarised them on July 31 in THE BRITISH JOURNAL OF PHOTOGRAPHY. They are now criticised by Haus Schmidt in the *Photographische Mittheilungen*. Dr. Krügner claimed that a slit passing in front of the lens could be quite as efficient as a slit passing in front of the plate; but Hans Schmidt points out that a slit in near proximity to the front of the lens does not transmit a band of light to the plate, as assumed by Dr. Krügner. It merely reduces the amount of light transmitted to the whole plate. For full efficiency, the slit must be some distance in front of the lens; but this has another objection, the farther the slit from the lens, the greater must be its width, otherwise the margins will not be exposed. This necessitates a wider blind, and destroys the advantages of compactness and lightness, which Dr. Krügner claims.

Doubtful Advantages.—The same writer criticises some of the advantages claimed for certain shutters, and recommends the purchaser to be wary in making his choice. One class is recommended because it opens and closes on one side, giving more exposure to the foreground than to the sky; another because it is always ready for use, and the speed can be regulated by pressing the ball—a flattering assumption of the photographer's competence to appreciate the difference between fractions of a second; another recommends his shutter because the image can be seen on the focussing screen in the action of setting. Happily, this hails from Germany.

Requisites in a good Shutter.—The speed, regulated by brake, should be adjustable, always the same, and under absolute control. The release should not be over-complicated, and effected both by hand and pneumatic arrangement. The shutter should move at uniform speed, silently and easily. The arrangement for time exposures should be absolutely certain and not dependent upon artifice; for instance, "pressure and quick release." Easy derangement of the mechanism should be impossible. If these conditions are complied with, the writer thinks the form of shutter unimportant. It will always be ready and certain in action. For the best work the most favourable position is between the lenses, as it obviates distortion and favours rapidity of action.

Movable Studios. — In the *Photographisches Wochenblatt*, M. Barlet offers some remarks on this subject well worthy of attention. The writer thinks we are often disposed to give too much weight to custom. In starting a new business there are many risks, and a portable studio would mitigate the loss if the site proved to be unfortunate. The art of building has advanced so considerably in recent years and materials have been so much improved, that there should be few difficulties in planning a studio combining portability with taste and comfort. Heating arrangements might be greatly assisted by covering the walls in linoleum, and this material may be used with advantage as a floor covering. The writer recommends a paved and cemented floor, which would give a firm foundation for the superstructure. With modern glazing there should be no more difficulty in constructing the roof than in the case of a permanent studio. Makeshift arrangements are not synonymous with failure, and, in confirmation, the writer refers to a series of photographs that.

appeared in Germany during the last decade. They excited universal admiration, and two or three photographers of note travelled to a remote bathing place to see the studio where these pictures had been taken. They found a harbour with two high windows. The light was regulated by means of a couple of curtains, and these, with a light background and a reflector, were the only appliances used to produce some really wonderful effects. And the artist? An assuming, amiable, young man, not far out of his teens, but with a quick eye and ready perception of light and shade. He posed with facility, arranged the lighting with the simple means at command, and astonished every one with the dazzling results.

Photo-mechanical Dry Plates.—Liesegang, in the *Photographische Archiv*, points out that fog is usually of the red kind when met with in these plates. They are prepared with an unripened emulsion, and, as red fog is only produced in the presence of soluble silver salts, one of the causes may be a residuum of nitrate of silver. Excess of ammonia in the developer, hyposulphite of soda used as an accelerator, and imperfect washing between development and fixing may also originate the trouble. Grey fog, on the other hand, occurs when an emulsion is over-ripened, over-exposed, or over-developed. It may protect a plate from red fog, but the photo-mechanical emulsion, being unripened and used for line work, where clear shadows are essential, the conditions are more favourable for the appearance of the red variety; but "red fog" is a misleading appellation. When the plate is fixed and washed, the shadows present a faint yellowish appearance. This changes to red in drying. Liesegang formerly thought light was the cause of this change of colour, but now considers it solely due to drying. If the plate is again wetted, the colour is changed to yellow. Red fog may be removed with Farmer's reducer, or bromide of copper, followed by hyposulphite of soda. It will also disappear if the plate is left for a few hours in the fixing bath.

Sunday Rest.—In the *Kölnische Zeitung* reference is made to the laws promulgated in various parts of the Prussian monarchy prohibiting the exposure of goods in shop windows during Divine service. A certain photographer was convicted of having exposed photographs in a show-case, and appealed against the conviction on the ground that the photographs were not exposed for sale, and should not be looked upon as goods. His appeal was disallowed, the Court holding that goods comprised not only objects for sale, but samples used as specimens.

The Kinetograph.—We read, in the *Photographische Correspondenz*, that the firm of Lechner has perfected an apparatus for photographing objects in motion, and reproducing them as lantern pictures. It is called the "kinetograph," to distinguish it from Lumière's kinematograph. It is claimed that the kinetograph is an improvement, as it permits of thirty to thirty-five exposures per second, the pictures being capable of projection on the screen with equal rapidity. The apparatus was exhibited, on July 15, before a number of persons interested in photography and many representatives of the press. Amongst the pictures shown were moving scenes of the Moscow Coronation Procession, street scenes in Moscow and Vienna, scene in the Vienna Riding School, Exercise of the Vienna Fire Brigade, a Skirt Dancer. The last picture was coloured, and very effective, the rapidity with which the series passed through the apparatus hiding any technical defects in the colouring.

Ceramic Photography.—In *Eder's Jahrbuch*, F. Haberditzl, of Vienna, gives the following directions, based on his own experience. The selection of a suitable gelatine is important, the writer having made some 400 experiments before hitting upon the right sort and correct proportions:—Dissolve 7 grammes of hard gelatine in 100 grammes of water, adding 6 grammes of sugar. Take 8 grammes of black oxide, or iridium oxide, rub it well down on a glass palette of about 40 cm. area with about 50 grammes of water, until the latter is almost evaporated. The solution of gelatine is then added a little at a time, and rubbed up with the oxide until a half-set jelly is formed. The mixture is then transferred to a porcelain evaporating dish, and placed in warm water until dissolved. It is then filtered through clean flannel and allowed to set. After a few hours it is redissolved slowly, plates are cleaned with whitening, and a levelling table prepared with a large sheet of plate glass, sufficient to take thirty plates 9 × 12 cm., for which this quantity of solution should suffice. The plates are coated and allowed to set on the bevelled glass. They are then set up to dry in a temperature of about 15° R. for twenty-four hours. When dry, the plates may be kept several months. They are sensitised in a three per cent. solution of bichromate of potash, and dried in a cool, dark place. Printing takes twenty-five to thirty minutes in a medium light, but this can only be determined by experience. When printed, coat the plate with a two per cent. plain collodion, cut round the edges with a penknife, and, immerse in cold water. When the bichromate is removed, lay a sheet of white paper on the film, add a little warm water, and, when the film begins to lift, strip it from the plate and develop with a spray of warm water. Transfer to a five per cent. alum bath for five minutes, and fix with alcohol. The film must then be transferred at once to the final support. When dry, the collodion film, now on the surface, must be removed by gently rubbing with a wad and acetic ether. The picture is then burnt in.

McDONOUGH'S IMPROVEMENTS IN PHOTOGRAPHIC COLOURED SCREENS.

Mr. McDonough says: "The object of my invention is to make a new and improved adjustable regulating screen for use with a camera in taking photographs, by which the quantity of the different coloured rays of light which pass from the object to be photographed to the sensitive plate may be regulated in relation to each other, determinate upon the nature of the light existing at the time the photograph is taken. While it is intended for use in taking all kinds of photographs, it is more particularly intended by me for use in taking photographs in colours

"My improved screen may be placed either before or behind the lens of the camera; or, if preferred, it may be placed in a slot between the two glasses constituting the lens. It places in the hands of a photographer means by which he can regulate the colour values of different light passing from the object to be photographed to the negative plate.

"Sensitive plates used in taking photographs differ in their actinic properties in accordance with different sensitising processes. With most sensitive plates the more refrangible rays, such as violets and blues, act very rapidly, and the less refrangible rays, such as reds and yellows, act very slowly. In fact, the ratios vary to a large extent. It is also well understood, as a fact, that in different localities there are more or less alterations of the actinic values in light. Pure sunlight, for example, is different from subdued light or artificial light. On a bright, sunny day the red and yellow colours in the light are in larger proportions than on cloudy days, while the blue and violet colours are in smaller proportions. If we look, for example, at a landscape on a dull day through a piece of orange or yellow-coloured glass, which suppresses the blue rays, the landscape will appear to be illuminated with sunshine, thus showing that there is an excess of red and yellow light on a bright day. Different parts of the sky are differently illuminated, the position of the sun altering the values of the colours. Accepting vermilion red, emerald green and ultramarine blue as representing the three fundamental colours of light, it is important to provide means for altering the amount or value of each separate colour that falls upon the negative plate after its passage from the object to be photographed."

The method of making the screens is fully described. The claims are:—

1. The method of making a negative by regulating the quantity of blue and green rays of light that pass from an object to be photographed to the sensitive plate, which consists in adjusting the size of the openings through which they pass to the sensitive plate, in relation to each other, determinate upon the nature of the light existing at the time the photograph is taken.

2. A compound regulating screen composed of two or more transparent plates uniformly tinted with different tints or colours, and adapted to be placed near the lens of a photographic camera, whereby the rays of light from an object to be photographed pass through such screen before reaching the sensitive plate.

3 A compound regulating screen composed of two or more transparent plates uniformly tinted with different tints or colours, arranged nearly in the same plane and adapted to be placed near the lens of a camera, whereby the rays of light from an object to be photographed pass through such screen before reaching the sensitive plate.

4. A compound regulating screen composed of two or more transparent plates uniformly covered with different tints or colours, arranged in

nearly the same plane, so as to be movable in relation to each other, and adapted to be placed near the lens of a camera, whereby the rays of light from an object to be photographed pass through such screen before reaching the sensitive plate.

5. A compound regulating screen composed of two or more transparent plates of different tints or colours, arranged to be movable in relation to each other, and adapted to be placed near the lens of a camera, combined with means for adjusting the plates in relation to each other, whereby the area of each colour may be easily adjusted to different conditions of light.

6. A compound regulating screen composed of two or more transparent plates of different tints or colours, arranged to be movable in relation to each other, and adapted to be placed near the lens of a camera, combined with indicating scales and means for adjusting the area of the different colours in relation to each other, whereby they may be easily and certainly adjusted to different conditions of light.

7. A compound regulating screen composed of two or more transparent plates of different tints or colours, adapted to be placed near the lens of a photographic camera, and having the part of the screen for regulating the quantity of the red and green rays surrounding the margin of the lens opening, and the part permitting the passage of the blue rays over the centre of the lens opening, and the part permitting the passage of the green rays and regulating the passage of the blue rays intermediate between the margin and the centre.

CITY AND GUILDS OF LONDON INSTITUTE: EXAMINATION IN PHOTOGRAPHY.

We append particulars, taken from the official programme of Technological Examinations, published by Messrs. Whittaker & Co., Paternoster-square, of the Examinations in Photography to be held next May by the City and Guilds of London Institute:—

Ordinary Grade.

I. *Syllabus.*—(1) *The Practical Examination* will include the following tests: To focus, expose, and develop a negative of a person or landscape, to print, tone, fix, and mount an ordinary print.

The candidate may elect to make his negative in collodion or gelatine, and his print may be produced by any of the methods in ordinary use. He will also be allowed to supply, if he so desire, his own apparatus, chemicals, &c., or he may use those provided by the local examiner. The fee for the Practical Examination only will be two shillings and sixpence.

II.—*The Written Examination* will include questions founded on such subjects as the following:—

1. The elements of photographic optics; the photographic camera and its adjuncts, lenses, diaphragms, shutters, shades, &c.
2. A general knowledge of the practice and theory of the wet-plate process.
3. The practice and theory of the gelatine dry-plate process; the composition of and defects in gelatine dry plates.
4. Various methods of fixing, developing, intensifying, and reducing negatives, with a general knowledge of the chemicals employed.
5. Silver printing, including vignetting and printing in clouds, toning, and fixing.
6. Retouching and spotting; mounting prints.
7. The lighting of the dark room.
8. The studio, and lighting of the sitter.

The fee for the Written Examination is one shilling.

Honours Grade.

Candidates for Honours must have previously passed in the Ordinary Grade.

The Honours Examination is both Written and Practical, and consists of two sections: A. Pure Photography; B. Photo-mechanical Processes.

Candidates will be examined in one only of these two sections, and may select the particular branch of practical work in which they desire to be examined.

In order that candidates may know what apparatus and material they will be required to provide for the practical part of the examination, full information as to the practical tests may be obtained from the Examiner on the afternoon of Friday, May 7, for the examination to be held on the following day.

For the year 1897, Practical Examinations will be held in London only, unless ten candidates, at least, apply to be examined in the same section (A or B) at some other centre.

The fee for the Honours Examination (Written and Practical), in either section, is three shillings and sixpence.

Section A.—Pure Photography.

I. *Written Examination.*—Candidates will be expected to answer more difficult questions in some of the subjects for the Ordinary Grade, and, in addition, a knowledge will be required of—

1. The theory of the photographic image, of development, fixing, intensification, and reduction.
2. The theory of light as applied to photography, including a general knowledge of spectrum and orthochromatic photography.
3. The principles of photographic optics.
4. The theory and practical use of sensitometers for testing the speed and gradation of plates, and their uses in printing processes.
5. The general principles of various negative processes which have been employed at different times.
6. Platinotype, carbon, and pigment printing, printing on argentic bromide papers; enamels.
7. Enlarging and making lantern slides in the camera.
8. Applications of photography to scientific purposes.

II. *Practical Examination.*—Candidates may be examined in (*a*) Studio work, (*b*) Copying or Reproduction, or (*c*) Landscape or Architecture. They will be required to show proficiency in conducting any of the following practical operations appertaining to the branch selected:—

1. To take in a studio quarter-plate gelatine negative of some object to be indicated.
2. To take an artistic portrait.
3. To print, tone, fix, and mount a silver, platinotype, or carbon print.
4. To test a sample of glass or fabric to be used in lighting the dark room.
5. To test the sensitiveness and gradation of a plate.
6. To find the focus of a lens either corrected or uncorrected.
7. To copy an engraving for a lithographic transfer.
8. To make an enlargement from quarter-plate.
9. To make a lantern-slide by contact.
10. To make in the camera a lantern-slide from a negative.

The Practical Examination will be held on Saturday, May 8, between 1.30 and 7, and at other times, if found necessary.

Section B.—Photo-mechanical Processes.

I. *Written Examination.*—Candidates will be expected to answer more difficult questions in some of the subjects of the Ordinary Grade, and, in addition, a knowledge will be required of—

1. The theory and practical use of different kinds of sensitometers.
2. The processes of photogravure.
3. The processes of producing 'phototype' blocks.
4. The processes of photo-lithography and photo-zincography.
5. The processes of collotype (collographic) printing.

II. *Practical Examination.*—Candidates may be required to show proficiency in practical operations in one of the above processes, numbered 2, 3, 4, 5, including the preparation of negatives suitable for each class of work, from (*a*) pictures in colour, (*b*) drawings in monochrome, (*c*) originals in black and in tints, and (*d*) natural objects.

The Practical Examination will be held on Saturday, May 8, between 1.30 and 7, and at other times if found necessary.

The Written Examinations in the Ordinary and Honours Grades will be held on Tuesday, May 4, from 7 to 10.

A separate return of the exact number of candidates who will present themselves in each grade, and in each section and branch of the Honours Grade, must be forwarded to the Institute by March 29th.

The following are the questions that were put to candidates at the examination held last May:—

Ordinary Grade.

[*Seven questions only to be answered.*]

1. How would you ascertain whether a lens had a visual as well as a chemical focus? (40 marks.)
2. How would you make or extemporise a background to suit a special effect? (40.)
3. How would you proceed to test a dark room to see whether the light were safe or not? (40.)
4. How would you pose a family group consisting, say, of father and mother, and three boys and two girls, of ages ranging from seven to seventeen? (40.)
5. Give a formula for a combined toning and fixing bath, and compare its merits with those of the separate bath system. (40.)
6. Why does a lens which covers a 10 in. by 8 in. plate, placed either way in the camera, not necessarily cover a plate 10 in. square? (40.)
7. Describe a method of writing titles on negatives so that they will print out on the proofs. (40.)
8. Describe a good and simple arrangement of studio blinds. (40.)
9. Give a design of a simple enlarging apparatus for use with daylight. (40.)
10. Describe the "double transfer" method of carbon printing. (40.)

Honours Grade.

Section A.—Pure Photography.

[*Six questions only to be answered.*]

1. Describe the "Artigue" process of carbon printing. (50 marks.)
2. Describe the composition and manufacture of celluloid as used as a support for gelatine emulsions. (45.)
3. Describe the relative merits of the collodio-chlorids and gelatino-chloride printing-out processes. (45.)
4. Describe a simple method of recovering residues from the hypo waste tub. (50.)
5. How would you find out the longest exposure you could give, without showing movement on the negative, to a train passing at a rate of

forty miles an hour in front of your camera, and at a distance of thirty yards from it, it being assumed that your lens has a focal length of six in.? (45.)

6. Discuss the relative advantages of lenses of large and small diameter, both being assumed to be of the same focal length, and to be worked with stops of the same size. (50.)

7. Explain the causes of the phenomenon known as "reversal of the image." (45.)

8. Describe Ives's method of producing stereoscopic pictures in their natural colours. (50.)

9. Describe the process of producing burnt-in enamels on porcelain (photo-ceramics). (50.)

SECTION B.—PHOTO-MECHANICAL PROCESSES.

[*Eight questions only to be answered.*]

1. Give a detailed description of the making of the transparency and preparation of the copper for a photogravure plate. (30 marks.)

2. Describe the operations of sensitising the carbon tissue (with formula for sensitising) and preparing the grain and resist for a plate by the "Klic" or carbon-tissue process. (40.)

3. State what acids, and of what strength, are used for the etching of a photogravure plate, and give, approximately, the normal time necessary for each etching in each solution. (40.)

4. How should a photogravure plate be inked up and printed from, and to what treatment should the printing paper be subjected before use? (30.)

5. Describe (*a*) the operations of preparing a negative by the collodion process of drawing in line for a photographic zinc block; (*b*) of a collodion negative of a photograph or drawing-in wash for a half-tone block. (50.)

6. Give formulæ for intensifying, clearing, and fixing negatives for half-tone blocks. (30.)

7. What is the object of employing irregular-shaped diaphragms or stops in the making of half-tone negatives? (50.)

8. Describe (*a*) the methods of printing on zinc by the bitumen and albumen processes, and (*b*) the enameline process on zinc and copper, and give formulæ. (50.)

9. Describe briefly (*a*) the process of etching a zinc line block; (*b*) the process of etching a half-tone block on copper, giving the kinds and strengths of acids employed. (40.)

10. What kind of a negative is required for the production of a photo-lithographic transfer? (20.)

11. Describe fully the method of preparing and sensitising the paper for a photo-lithographic transfer, and detail the operations of inking up and transferring to stone or zinc. (50.)

12. Give a formula and method of working for the production of a grained transfer from a half-tone subject, say, a photograph or wash drawing. (50.)

13. Describe generally the operations of preparing, coating, and drying a collotype plate, and give formulæ. (50.)

14. Describe the methods of determining the proper exposure of the plate under a negative, and briefly explain the operations necessary for proving and printing from the plate. (30.)

15. State in which instances it would be preferable to employ bichromate of potash instead of bichromate of ammonia for sensitising, and *vice versâ*. (40.)

HONOURS GRADE.

PRACTICAL EXAMINATION.

Saturday, May 9, 1.30 *p.m.*

SECTION A.—PURE PHOTOGRAPHY.

[Only *one* test to be made.]

A. *Studio Work*.—1. Take a portrait bust suitable for vignetting.

Three plates, quarter size, are supplied, and two are to be sent in, but the candidate must select himself which one he considers the more successful.

A rough print should, if possible, accompany the negative. The exposure must be made in the presence of the Local Examiner, but the plates may be developed at home, the results being handed in or posted on Monday.

B.—Copying or Reproduction.—1. Print and develop a print from a negative (supplied by the Institute) by the single transfer carbon process; or 2, Produce a print in platinotype (cold-bath process) from the negative provided for the purpose. The Institute will provide the tissue or the platinotype paper, but the centres or candidates must provide frames, dishes, water, &c., with the exception of the platinotype developer, which will be provided the same time as the paper.

C.—Landscape and Archite ture.—Expose and develop a negative of the place or building selected by the Local Examiner.

Candidates are to supply their own apparatus and plates, four in number, each of which must be initialled before use by the Local Examiner.

Arrangements will be made with the Local Examiner by which candidates may have their plates initialled and the site to be photographed communicated to them on the evening of the day prior to the Examination, so that they may have the whole day at their disposal for selecting the most suitable conditions of lighting.

The candidates may develop their plates where they like, but must return all four, used or unused, indicating that one they select as best, to the Local Examiner not later than noon on Monday, May 11, to be forwarded to the offices of the Institute.

If possible, a print should accompany the selected negative, which should be trimmed to the size considered most appropriate, and, in any case, the negative should have the dimensions the print is to have marked on it.

HONOURS GRADE.

PRACTICAL EXAMINATION.

Saturday, May 9, 1.30 *p.m.*

SECTION B.—PHOTO-MECHANICAL PROCESSES.

[Only *one* test to be made.]

(*a*) *Photogravure.*—1. Prepare a transparency from a negative by a carbon process for photogravure. (30 marks.)

2. Print a "resist" from a transparency, and transfer and develop on copper prepared for etching. (50.)

(*b*) *Phototype Block.*—1. Print from a line negative by the albumen process on zinc, and prepare the plate for retouching before etching. (30.)

2. Print from a half-tone negative on zinc or copper by the enameline process, and etch the plate. (50.)

(*c*) *Photo-lithography.*—Print a transfer from a line negailve, and ink up ready for transferring to stone. (50.)

(*d*) *Collotype.*—Prepare sensitised solution and coat a glass plate, dry same, expose under a negative, and make ready for printing. (50.)

THE JOLY PROCESS OF COLOUR PHOTOGRAPHY.

[American Philosophical Society.]

I HAVE the honour to present to your notice this evening, by courtesy of Mr. Richard Barkley, of New York, a series of specimens illustrating the so-called "Joly" process of colour photography.

They are the same as were lately shown before the Royal Society of England, and excited considerable attention.

This process, although it depends upon the three primary colour sensations, differs materially from all others thus far brought to the notice of the public, because but a single photographic manipulation is required, and no apparatus is needed other than such as is used in ordinary every-day photography.

This process consists in making a negative through a closely lined screen, ruled in three colours, viz., orange, yellow-green, and blue-violet. The screens used in the specimens here shown were made with an ordinary ruling pen, such as is used by draughtsmen, and the lines number about 200 to the inch. A finer ruling in the future will make the lines which we now see in the specimens before us less prominent.

It will be noticed that Professor Joly, in his "taking" screen, which is here before you, has substituted for the usually accepted primary colour sensations—red, green, blue—the colours, orange, yellow-green, and blue-violet. Experience has taught him that not only were the former colours unsuitable for the purpose, but that, to reproduce the effect of natural colours, a somewhat different screen must be used over the resultant positive image. For this purpose Professor Joly rules a screen in pure red, green, and blue-violet. This he calls his viewing screen.

[For the red-selecting lines of the "taking" screen Professor Joly uses a spectrum colour, such as that to be found at one-sixth of the distance from the line D to the line C; for the green-selecting lines he uses a colour corresponding to that of the spectrum at about one-third of the distance from the E line to the D line; and for the blue-violet selecting lines he uses a colour corresponding to the spectrum colour near the F line, but toward the G line. On comparison of the "taking" screen with the spectrum, these colours can be called a red-orange, yellow-green, and a violet-blue. For the colours of the "viewing" screen he uses a pure red not far from the C line; a green near the E line; and, for the blue-violet lines, he takes a spectrum colour between G and H, the object being in the "viewing" screen to transmit fundamental colour sensations only, and to let the eye do its own mixing; the eye is assisted by the depth of light and shade in the linear areas of the positive; for instance, if the full amount of light of two adjacent red and green lines be transmitted, the eye sees a yellow; if, now, some of the green be obstructed or shut out by the positive over it, then the eye will see an orange; and, if, on the other hand, some red be shut out by the positive, then the eye sees a yellow-green, and it is easy to see that one can run all the colours from pure red to pure green by the varying amounts of the red or green lines shut out by the positive.]

The first specimen we have here is a negative of a china plate and jug, photographed through the "taking" screen.

The next one is a glass positive printed in contact from the above negative. It will be noticed that neither of these specimens differ from ordinary photographic results, except that lines due to the use of the screen are somewhat prominent.

The third specimen is a positive similar to the one just shown, placed in register with a "viewing" screen; and, by holding it up to the light and viewing it through the ruled grating, we see the china plate and jug in the bright colours of the original objects.

The next subject is a male portrait from life. This illustrates the possibility of the process in its application to professional portraiture.

We now have a portrait of an Irish peasant girl, not from life, it is true, but from a water colour, which is here before us. The specimen labelled No. 7 is placed in contact with a viewing screen. The original is here offered for comparison, so that you may judge of the fidelity of the reproduction to the colours of the original. To prove the correctness of his theory, Professor Joly here presents another specimen of the same subject, No. 12. This is taken and placed in contact with the same ("taking") screen. The great difference and the falsity of the colour rendering will at once be noted by comparison with the original.

The next specimen is perhaps the most interesting one of all, on account of being an almost instantaneous picture.* It represents a military band in the Park of Trinity College, Dublin. It will be noted that the bright reds of the uniform coats are exceptionally well rendered. Further, this example indicates a possible application of this method of colour reproduction to snap-shot photography.

I now wish to call your attention to an interesting feature of this process, viz., the necessity for having the photograph and screen in exact register, and viewing it in a normal position. Viewed direct, this transparency shows the colours of nature; the brilliant red hue of the coats is especially noticeable. Now, if we turn the transparency so as to view it at a slight angle, we at once note a change of the colours, and, in this particular instance, an apparent change of the nationality of the subjects: in place of English soldiers in bright red coats, we see a body of men dressed in brilliant green; in short, the Englishman appears to have been turned into an Irishman of the most pronounced type.

The next subject is a perfect representation of a green fluorescent bowl, made of uranium glass.

We now come to another interesting specimen—a photograph of a bunch of wall flowers, executed in two colour sensations only, viz., the red and green sensations. This picture derives an additional interest from the fact that it was made by Professor Joly, at the request of Lord Kelvin, to show the effect of "violet blindness," an extremely rare variety of colour blindness.

I now present to your notice two photographs of the solar spectrum from nature, the first one made through a "taking" screen, and seen through a "viewing" screen, which, as you will perceive, shows some of the principal lines; the other one, both taken and viewed through the "viewing" screen, shows a false colour rendition. The yellow, passing through the red lines only, is almost entirely represented by pure red. The incorrectness of the result is evident on comparing it with the first specimen or with nature.

I now come to the commercial part of the process. I have here for your inspection a specimen of three-colour printing. The original photograph consists of a single negative; the printing was done from three separate half-tone blocks or plates—red, yellow, and blue.

This result is obtained by making three positives in the camera from the original negative in the following manner:—A special screen is prepared, with black lines twice the width of those upon the taking screen, the intervening space being the width of a single line. This screen, when placed in register with the original negative, it will be observed, exposes only every third line of the negative. Now, it will be obvious that, if this screen be moved the width of a single line before each exposure, we shall obtain three positives, each showing but one-third of the original negative, and, at the same time, representing a different colour sensation. An ordinary half-tone plate is now made from each positive in the usual manner, and then printed successively in yellow, red, and blue inks, the same as in the ordinary chromo-typographic or three-colour process.

In the case under consideration, you will note the almost perfect result without the presence of the objectionable mathematical cross-line hatch-work.

The latter adaptation of the Joly process, I am informed, is the invention of two young men in this country, and, should it prove practical and give certain results, it will, without doubt, be a great step forward in chromo-typography, and also have commercial value.

It is a curious fact that the foundations of the interesting processes I have described are based, and depend for their ultimate success, upon the ruling machine, an invention of Joseph Saxton, a former member of this Society, specimens of whose early photo-mechanical reproductions, made in 1841, are still in our possession.

In conclusion, I will state that the one great advantage which this process seems to offer over other schemes in heliochromy or the three-colour process, is the fact that but a single negative is required, which is obtained by the ordinary method of photography, so that all special or intricate apparatus, with uncertain results, are obviated. It will be further noted that the specimens shown here to-night are among the earliest ones made with crude appliances as to the ruling of the screens and the pigments.

JULIUS F. SACHSE.

* Actual time about three seconds.

SOLARISATION OF DRY PLATES.

THE *Photographisches Archiv* for May 1896, page 129, contains an article from the pen of R. Ed. Liesegang on the "Solarisation of Dry Plates." A translation of this appears in THE BRITISH JOURNAL OF PHOTOGRAPHY for June 12, 1896, p. 376.

In this article Liesegang commences by drawing attention to the positive which is seen when a negative is viewed from the back against a dark background. He points out that these positives are less pronounced in the case of under-exposed negatives, but distinct and of a whitish colour in the densest portions (such as the sky of a landscape), of fully exposed negatives. He then proceeds to make the following positive and decidedly startling assertions, that "this whiteness is due to a remnant of bromide of silver, which is left unchanged during fixation, and is held between the reduced silver and the glass. . . . . In those parts of the plate fixation is not complete, and, even if more time had been given for the action of the hyposulphite of soda, the bromide of silver would not have been removed. . . . If bromide of silver is left behind amongst the silver, the former cannot have been reduced by the developer, and the picture does not always extend from the surface to the glass. And especially is this the case in the highest lights, where it might be most expected . . . . *It is therefore certain that the developer also has not penetrated to this depth in the high lights* (the italics are his own) and therein resembles the hyposulphite of soda. With a shorter exposure, on the contrary, it penetrates the entire film and reduces the bromide of silver through to the glass."

In support of the above statements Liesegang brings forward not a single convincing chemical experiment, but only a number of observations which can more simply and correctly be explained according to the usually accepted chemical hypothesis.

Yet, based on these, as I hold, incorrect assertions, Liesegang proceeds to propound a theory of solarisation, which practically amounts to this, that in a negative a more or less dense film of silver is formed on the surface, where strong light has acted, and this film acts as a mechanical restrainer and retards, *or even prevents*, development and fixation of the more deeply seated silver bromide in these fully or over-exposed portions. At the risk, however, of being tedious I had better give his own words:—

"In this way a phenomenon can be accounted for, in explanation of which purely chemical causes have usually been accepted, viz., the solarisation of dry plates.

"If part of a plate is very considerably overexposed, the reduction is confined to the mere surface in that part. The film of metallic silver formed there is extremely thin, but it hinders completely the further penetration of the developer.

"The reduction on the surface is too rapid at that part, but at the others, where the exposure is less, the reduction occurs more slowly, and meanwhile there is time for the developer to penetrate to the underlying portions. The latter consequently are stronger, and contain no bromide of silver.

"The rapidity of reduction is the all-important thing. It is not necessary to assume, as I at first thought, that with longer exposure a coherent skin of silver, whilst, on the contrary, with shorter exposure, one rich in pores is formed."

Curiously enough, after making these very positive assertions, we further on came upon this very convenient admission, "It is impossible to prove or to controvert this theory of solarisation, in the development of dry plates by experiment." Surely, if it is impossible to prove this theory, it is useless to assert it so positively. At the best it can but be looked upon as a working hypothesis.

As a matter of fact, one or two very simple experiments and observations are sufficient to prove the inaccuracy of the statement on which Liesegang bases his theory. These I propose to record here and to discuss some of the various observations he adduces in support of his theory, leaving to a future occasion the discussion of the alternative chemical theory which experiments I now have in hand point to as being an excellent working hypothesis.

1. Place a very fully exposed film negative, which has been developed for four or five minutes, in a fixing bath, and allow it to float face downwards so that the back can be observed as fixing proceeds. It will then be clearly seen, especially if the emulsion is thick enough, that even in the overexposed parts the undeveloped silver bromide next to the celluloid support gradually fixes out.

2. On examining such a negative from the back against a dark background the fully exposed portions, and especially the densest portions, show the whitish appearance that Liesegang puts down as due to unfixed silver bromide. Now proceed to partially strip the gelatine negative from the celluloid support, so that one-half of a high light still adheres to the film and the other half is free. A film negative being more pliable than a glass one, it is easier to properly separate the gelatine from its support. The negative is now reimmersed in the hypo solution, so that the latter has full access to the back of half the high light. After half an hour or an hour's fixing, re-examine the stripped and unstripped halves. It will be found that the two show practically no difference. In other words the whitish appearance at the back of the high lights is not due to silver bromide. If the gelatine is very soft, the free portion of the gelatine skin may swell and stretch a good deal. It will, therefore, look a shade more transparent in the high lights when free than when it adheres to the

support. After many hours too in the hypo solution, a slight darkening at the back will be visible, but it is extremely probable that this is due to the slight solvent action which Messrs. Haddon and Grundy have shown hypo exerts on the fine silver deposit, constituting the image, in the presence of air.

Other experiments can easily be adduced, but practically No. 2, given above, disposes of the whole of Liesgang's hypothesis.

Now, with regard to the observations which Liesegang brings forward in suppoort of his theory; he writes "In the *Photographisches Archiv*, 1996, p. 10, I have drawn attention to the fact, that a dry plate upon which a metallic veil has been formed during development fixes very badly. It always contains a remnant of bromide of silver."

I find, on looking up the original article, that the metallic veil referred to is red fog, which he states forms a difficultly permeable film over the surface of a plate, causing it to fix more slowly and even leaving a faint white deposit (according to Liesegang) of unfixed silver bromide in the gelatine film, visible by reflected light, but almost invisible by transmitted light. Here again, however, he brings forward no valid chemical proof in support of his hypothesis that this faint white deposit is silver bromide. The mere fact that the plates will fix even when red fog is present is surely sufficient to make one suspect that, whatever this white deposit may be, it most probably is *not* silver bromide. Some gelatines when wet show a white opalescence, and again, plates which show marked red fog by transmitted light look greenish-white when examined against a dark background by reflected light. As a matter of fact, however, it seems to me that Liesegang has put the cart before the horse, for thickly coated plates, *i.e.*, plates which fix slowly, are very liable to show a red stain. If a pyro developer has been used, this stain may be due to two causes. First it may be true red fog (*i.e.*, a fine silver deposit) most probably caused in the following way. Owing to the slow rate of diffusion in the thick gelatine film, it is not easy to remove the developer from it; consequently, when the negative is being fixed, the developer left behind may reduce some of the soluble silver thiosulphate salts formed when the fixing solution enters the gelatine, and a fine red deposit of silver is thus left behind in the film. A test-tube experiment will demonstrate the probable correctness of this explanation. To some washed silver bromide add only just sufficient strong fixing solution to dissolve it, then add a little pyro soda developer. On allowing the mixture to stand for a short time, the silver in it will be seen to precipitate in the form of a mirror on the sides of the test tube. Secondly, the stain may be simply pyro stain, for during its slow diffusion out of the thick gelatine film the developer gets oxidised to a red pigment, and subsequent treatment with acid will not entirely destroy this stain; prolonged washing only intensifies it. Treatment with a copper sulphate solution containing potassium bromide, as Liesegang recommends, will remove the red fog, but not the red pyro stain. The best cure for these stains I know of is *prevention* by immersing the films in a strong alum bath slightly acidified with sulphuric acid, or in a ten grain to the ounce chrome alum solution immediately after developing the negatives, only giving them a very short washing or rinsing between the two operations. After remaining in the alum bath for five minutes, wash them slightly and then fix them. They will be free from stain, the staining and developing power of the pyro in the gelatine film having been destroyed. N.B. Not all negatives, however, will stand this treatment, as the great hardening they are subjected to causes them to adhere less firmly to their support, and they then tend to blister off it.

In support of his contention "that the silver reduced by light and the developer does not permit the hyposulphite of soda to force itself through," Liesegang next brings forward this statement: "This explanation is supported by the fact that, at the juncture of a very dark with a light part of the negative, the bromide of silver is removed in fixing for the breadth of about a millimetre round the dark part. Consequently the positive seen from the back of the plate is smaller than the negative. The hyposulphite of soda in those parts has not penetrated from above, but sideways." At first, I confess, this observation seemed to bear our Liesegang's hypothesis; but recent experiments I have carried out show the cause to be a very different one. However, the explanation would take too long here, and I can only, at present, state that the black edging is an halation phenomenon, and that its colour, as well as the colours of the different silver deposits which go to form the image in a photographic film, are entirely dependent on the character and amount of the silver deposit in the different portions of the image.

Finally, Liesegang adduces the following observation, made with gelatino-bromide plates, as a good instance proving his theory: "A normally exposed plate after a certain time shows a negative through the glass (for shortness I will use the expression negative penetration). This negative grows more intense as development proceeds."

"An underexposed plate also shows negative penetration, especially if so much light has passed through that a blackening is perceptible from the glass side, otherwise it remains uncoloured. A much-over-exposed plate, after prolonged development, shows strong positive penetration. Sometimes this positive is preceded by a negative, but this soon disappears as the back takes on a faint even colour. The positive then follows."

Now this very clearly describes what is frequently observed in the case of plates which show a tendency to give chemical fog, particularly when, owing to slow setting, such plates have a layer of coarse and easily fogged particles of silver bromide deposited close to the glass. Now possibly the mechanical *restraining* in the high lights which Liesegang suggests does take place, but I am convinced not to anything like the extent that he imagines. On the chemical hypothesis of development and solarisation the above observation is very simply and thoroughly explained. Where the light action has been greatest, development is at first very energetic on the surface, and therefore in the high lights the penetrating developer not only gets weakened, but also relatively excessively restrained, so that it may happen that the developable particles of silver bromide next to the support in those places will be longer in developing than the corresponding particles in the shadows. Viewed from the back, therefore, the shadows will appear blackish and the half-tone and high lights whitish.

F. KROHN.

The Inquirer.

*** *In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

CARBON PRINTING.—J. B. inquires: "What is the supposed advantage of the addition of ammonia to the bichromate sensitising bath for carbon tissue? Am I right in supposing it leads to greater sensitiveness? I have been trying it lately, adding one drachm of strong ammonia to a pint of five per cent. bichromate, but the only effect I can trace is that the tissue becomes insoluble in half the time it does without the ammonia."

ENCAUSTIC PASTE.—J. ESCOTT says: "Formulæ are given in the ALMANAC and elsewhere for 'encaustic paste,' which I am told is a preparation to be applied to the surface of prints to give them a better finish and bring out the details. Is it to be used as a preliminary to rolling or burnishing, or does it dispense with the burnisher altogether? Also, is it suitable for gelatine and collodio-chloride paper, or is it only for use with albumen?"

NON-COAGULABLE ALBUMEN.—In reply to E. Freeman, "Beta" and several others say: "In the present year's ALMANAC will be found an article by Mr. Edwin Banks on 'Inverted Albumen,' which I expect is the substance inquired about by your correspondent." We have also made search, and find that the leader in which this peculiar form of albumen was described appeared in our issue for August 15, 1884. In that article and in Mr. Banks's the fullest details of its properties will be found.

TRIPOD STAND "JAMMING."—AMATEUR writes: "I have a folding and sliding tripod which is a source of great trouble to me. If laid away for only a few days the sliding portion becomes so jammed together that it is impossible to move it until it has been held before the fire for some time, and this treatment I am sure cannot be very good for it generally. When it has been in use in the open air for a few hours it works easily and freely enough. Could you inform me of any sort of lubricant I could apply while it is in this condition that would keep it in working order? I have tried French chalk, but that does not seem to do much good. A friend suggests black-lead, but that would be unsightly and dirty."

UTILISING CALOMEL.—W. B. H. writes: "In reply to W. H. E. *re* Calomel, for many years past, when in travelling, I have found that intelligent creature, the country pharmaceutical chemist, disinclined to let me have an ounce of corrosive sublimate, I have invariably fallen back upon calomel. He doesn't mind how I poison myself as long as I don't get him into trouble. It is not much trouble to work it up into intensifying form. Take an ounce of calomel, an ounce of hydrochloric acid, and two or three ounces of water, and boil the whole together in a porcelain dish, or in a jam pot plunged in a saucepan of hot water. The calomel will soon dissolve, forming a strongly acid solution. Allow it to cool partly and add, drop by drop, strong ammonia until a slight permanent precipitate is formed, and the solution should then be neutral or nearly so. It may now be filtered and made up to twenty ounces, and will consist then of the ordinary solution of bichloride of mercury and sal ammoniac given in the text-books. I am not sure that it isn't an easier way to make the solution than by dissolving the bichloride direct, as the latter takes such a lot of shaking."

Utilising Calomel.—In reply to W. H. E., you are wrong in saying hydrochloric acid has no action upon calomel, though at ordinary temperatures it has not much. If you will boil the calomel in an open dish with dilute hydrochloric acid, it will soon dissolve, and, by adding gradually more acid and more calomel until a very concentrated hot solution is obtained, the corrosive sublimate is easily produced in crystals on cooling. Or, by calculation, a solution of definite strength can be made without the trouble of crystallisation. It is important that the operation be carried out in contact with the atmosphere as in an ordinary evaporating basin, as, if done in a close flask, a portion of the mercury is reduced to the metallic atate..—F. P.

Insensitive Collodion Emulsion.—Replying to "Halifax," I should say from my own experience that the *best* light that could be safely used for coating as referred to by Mr. E. Sanger Shepherd is such a light as would suffice for wet collodion, but that would not be sufficient after the emulsion plate was washed. It is a curious fact that although less sensitive, in the camera, than wet plates, bromide emulsion films are more *exigeant* in the matter of the illumination permissible in their handling, and would fog badly in a light which would be quite safe for wet collodion. As for coating in daylight, if it were possible, I would reiterate the remark made on Aug. 14, *Cui bono?* In the old days of tents and wet plates there was a very distinct advantage in being able to coat the plates in the open air, when an old and well ripened iodised collodion was in use; but an ordinary collodion emulsion does not possess the pungency or the penetrating powers of such a collodion.—Syntax.

Retouching Medium.—Portraitist asks: "Can you or any brother professional give a formula for a really reliable retouching 'medium?' I have tried several that have been placed on the market, but find them as a rule worse than useless. Sometimes, for no very apparent reason, they behave decently—at least some of them—but I am at a loss to discover the reason of my occasional successes. One very much advertised 'medium' when applied as directed gives a greasy surface, which certainly takes the lead to some extent, but it is so smeary that the negative cannot be printed from for a day or two, and even then seems to attract every particle of dust about the place, to remove which means also removing the retouching. If allowed to harden, which it will do in about a couple of days, before retouching, the pencil refuses to bite at all, so I don't see much use in it. I have done and can rely upon doing better work with a simple solution of common resin or turps, and this has the further advantage that a pint of it does not cost as much as an ounce of the other. I am speaking now of retouching *on the film*; for varnished negatives I want a better surface than that given by the varnish for which the formula is given in the Almanac, consisting of sandarac and castor oil. But it is often desirable to do some of the work before varnishing. *Is* there a trustworthy 'medium?'"

Insensitive Collodion Emulsion.—In reply to "Halifax," it will depend entirely upon the purpose to which the emulsion is to be put whether it may be coated in daylight. If for landscape work, with a full or very long exposure, it is probable that coating in diffused daylight would not do much harm; but, for any purpose where extreme purity of the unexposed parts is necessary, such a course would be fatal. Although unwashed collodion emulsion, and, to a less extent, washed emulsion, are practically unaffected by daylight *in bulk*, the matter is very different when spread on a thin film upon glass. Then the washed emulsion is just as sensitive wet as dry, and the apparent immunity from injurious action before coating is only due to the fact that the fog produced on the surface exposed is mixed up with the body of the emulsion and masked. But every such exposure detracts from the brightness of the emulsion. With unwashed emulsion the case is somewhat different, owing to the presence of soluble bromide. Here the coated, but unwashed, film is so insensitive that it may be exposed in the camera for a much longer time than actually necessary if washed, and no image will appear on development; but it may be re-exposed and produce a perfect result. For any work, such as transparencies, I doubt whether it would be safe to coat by uncovered candle light; certainly daylight would ruin the brightness of the high lights, although in the case of a landscape negative the veil produced would perhaps be an advantage in the shadows. I am speaking now of ordinary emulsion, but, if it be colour-sensitised, it requires nearly as careful handling as gelatine plates.—W. B. B.

Fixing Prints.—C. P. R. asks some questions that look very much like conundrums. I should say that the best way of "gauging the sufficiency of the solution" is to have enough to comfortably take the number of prints to be fixed. There is nothing to gain and everything to lose by "scamping" the work or by tempting to economise hypo. Then again, if "just sufficient solution has been used" it would look as if it ought to be *exhausted* at the finish, and that its "strength, in hypo at least, would be *nil*." At any rate, the "hydrometer" has yet to be invented that would prove of much, if any, use in this direction. With the strength of solution and time of immersion mentioned, C. P. R. need not trouble himself further than to use plenty of it and to turn the prints over singly two or three times, so that they may get a fair share of its action. And then he will save more in the long run by throwing it away than by attempting to do with half the quantity or venturing into specific gravity tests. "Alpha's" queries also relate rather to fixing than washing. The best temperature for the fixing bath is that of the atmosphere at the time, unless it be excessively hot or cold, when artificial means ought to be used to bring all the solutions and washing waters to something near the normal. The strength of the bath will depend upon circumstances to some extent, depth of printing, character of paper, tone desired, &c., but three ounces of hypo to the pint, or a fifteen per cent. solution, as C. P. R. has it, which is nearly the same, is a very good standard, to be varied as circumstances dictate. A weaker solution takes slightly longer to fix, but reduces the prints less, and has less influence in altering the tones. Beyond that, there is not much to choose between two or four ounces to the pint.—Syntax.

Our Editorial Table.

We have received for trial, from Miss Annie Wood, of 33, Great Coram-street, W.C., a small sample of sensitised albumenised paper. It appears to give very good results.

Samples of Christmas Mounts.

Marion & Co., Soho-square, W.

The earliest reminder of the forthcoming festive season comes to us from Messrs. Marion & Co., who send us several samples of mounts for Christmas photographic cards. They are of great variety, and range in size from midget to cabinet, comprising the folding, the single, the embossed, and the "slip-in" kinds, so that there is a choice of either mounting the photographs direct or slipping them in the mounts. The tints selected are artistic and in good taste, and the designs are in all cases refined and pleasing. The list accompanying the samples shows that Messrs. Marion have a most varied selection, from which it should be impossible for the photographer to make a choice without pleasing himself and his customers.

Optique Photographique.

Par Adolphe Miethe, Dr. Sc. Paris: Gauthier-Villars et Fils.

This is a translation, in French, of Dr. Miethe's work, in German, on the optics of photography, a subject with which, it need scarcely be said, the author is well qualified to deal. The book before us avoids mathematics, and is designed to appeal to practical photographers; nevertheless, it appears to be fairly exhaustive. The principal chapters treat of the principles of optics as applied to photographic lenses; aberrations; and diaphragms; while the commoner types of lenses are examined and described, the book concluding with the description of a series of tests for lenses. A chapter is appended briefly telling of the chief points involved in the manufacture of lenses. The work is an admirable one.

Catalogues Received.

C. P. Goerz. Berlin.

Mr. Goerz not only makes the anastigmatic lenses with which his name is associated, but also, according to the evidence of his catalogue which is before us, gives attention to other forms of objectives, as well as cameras, studio, tourist, and hand, the latter in great variety; stands, lanterns, shutters, dark-room requisites, &c. Some optical tables and notes are included in the catalogue, which is well illustrated. We may note, in passing, that special prominence is given to the Ansehutz hand camera.

E. Mayo, 8 & 10, Boulevard Magenta, Paris.

Appealing chiefly to amateur photographers, M. Mayo's catalogue, which consists of about 160 freely illustrated pages, deals with a

very varied assortment of apparatus. Judging by this and the catalogue above noticed, English and Continental photographers possess great similarity of taste, and require to be provided for in just about the same manner.

Artistic Landscape Photography.

By A. H. Wall. Bradford: Percy Lund & Co.

Surely those who aim to produce pictorial results in photography are well catered for as regards books on art. The volume before us is the second on the same subject, from the same publishers, that has reached us during the last few weeks. Mr. Wall addresses beginners in art, "including the veriest tyros," but he is frequently so controversial that he cannot escape going over the heads of his audience. His chapters, which partake largely of the nature of essays, discuss such subjects as, "The Imagination and its Cultivation." "Truthfulness in Art," "The Expression of Space," "Skies, Clouds, and Aerial Perspective," "Water as an Element of Pictorial Effect." There are several explanatory illustrations, and the work which, in our judgment, hardly appeals to a beginner, is well worth reading. We append two extracts, which will give our readers an idea of the lines upon which the book is fashioned.

"The Ordinary Camera Man

". . . . sees what he wants almost at a glance, and straightway plants his tripod at the usual height, elevates his camera, and looks to its levelling, focusses to secure equal sharpness of detail on every plane, near or distant, and in every object, whether of dominant or subordinate interest; regulates his exposure and development with ideas in no way suggested by pictorial intentions, imaginative conceptions, or poetic sentiments. He is in every way the slave of his tools . . . . And, as he seeks a subject, so he exposes a plate with his heart untouched, his thinking powers inactive; . . . . proud to think he can 'take a picture,' and call himself an artist," &c.

"The Artistic Man

". . . . sees the selected view at various times; under different conditions of light and atmosphere, carefully determines what shape and size will be best for it in connexion with the means he has to work with, and all he desires to include in the view, and also what he desires to exclude. He tries various points of view; now higher, now lower; now to this side, now to that; sometimes backward, sometimes forward; his thought all the time busy with the principles of harmony, variety, contrasts, considering the value of time in connexion with the coming exposure and development, and anxious about obtaining truthfully the expression of air and space," &c.

We hesitate to run counter to so high an authority as Mr. A. H. Wall, but we cannot help suggesting that both the above pictures are grievously overdrawn. "Ordinary" camera men are not the fools he tries to make them out, nor are "artistic" camera men the formidable geniuses he would have us believe. And we know a good many of both sorts of photographers.

Early Work in Photography: A Text-book for Beginners.

By W. Ethelbert Henry, C.E. London: Dawbarn & Ward.

The beginner, like the photographer supposed to be pining after art knowledge in camera work, is also liberally catered for, very many first handbooks and primers having been recently published; but Mr. Henry's book disarms objection by its excellence, and is really one of the best and most practical text-books for beginners that we have read. It is a useful and plainly written guide to stand-camera work, full of sound information on printing, toning, developing, &c.; the use of apparatus; work in the dark room, and a score of other subjects. There are many helpful illustrations and an actual negative and positive on celluloid accompany the book, which we can cordially recommend to new hands. We quote the introductory hint to beginners: "If you wish to be an all-round, slip-shod dabbler, try every different make of plate, paper, developer, and toning bath that each of your friends recommends—of course before mastering any of the technical details of photography. But, on the other hand, if you wish to become a clean and careful worker, capable of producing excellent results, stick to one brand of plates, one formula for developer, and one toning bath until you understand them thoroughly and can produce a good negative and a good print every time—or else know the exact cause of failure. When you can do this, the field of experiment is ready to offer you a welcome." It is an old sermon, to be sure; but how true!

The Cadett Plates.

Cadett & Neall, Ashtead.

Sample packets of the latest makes of two of Messrs. Cadett & Neall's popular brands of plates have lately reached us, and were subjected to trial in the camera. These were the Ordinary and the Professional. According to the speed numbers, the Professional is a plate of about three times the rapidity of the Ordinary, the actual H. & D. numbers being 61 and 21 respectively. Using pyro soda, we found this ratio about maintained in practice. The quality of the results yielded by the Ordinary point to its being well adapted for landscape work, interiors, &c., density of deposit and fineness of grain, as claimed, being its characteristics in a marked degree. The Professional—the faster plate—gives soft and delicate results that appear to fit it admirably for portrait and studio work. It has always been our experience of Messrs. Cadett & Neall's plates that scrupulous care appears to be exercised in their preparation, and thus we were not surprised to find the samples of the Ordinary and the Professional clean and flawless. Photographers must take pleasure in using such well-made plates.

News and Notes.

"Invention."—Our interesting contemporary is now under new proprietorship, and Mr. Perry F. Nursey has been appointed Editor. Many new features are promised.

The Photographic Club.—Anderton's Hotel, Fleet-street. The subject for discussion on Wednesday, September 2, will be *The Management of a Photographic Society*. To be introduced by Mr. Walter D. Welford.

"The X Rays in 1847" is the heading of a paragraph which our contemporary, the *Scientific American*, quotes from its number of June 5, 1847, wherein it is stated that "a Belgian *savant* says he has just discovered that electric light directed on the human body makes it so diaphanous as to enable the arteries, veins, and nerves to be seen at work, and their action to be studied"

Royal Cornwall Polytechnic Society's Exhibition.—Awards in Photographic Department: First silver medals—W. M. Warneuke, G. Lafayette, W. J. Byrne. Second silver medals—H. Yeo, W. M. Harrison, E. Bull, Dr. W. Page May. First bronze medals—F. Marsh, W. H. Pugh, S. Bolas & Co., C. M. Wane, F. C. Iuston, H. Tonkin. Hon. mention—Mrs. J. Blamey. Photographic Appliance Department: Messrs. Spratt Brothers, first bronze medal; acetylene apparatus awaiting trial.

Suiting the Action to the Word.—At the recently held Convention in America, Mr. G. G. Rockwood was lecturing, and a question came from the audience concerning the use of head rests. "This," said Mr. Rockwood, "cannot be disposed of by any arbitrary rule. Sometimes we must use them; at others they are impracticable. Let me tell you a story. A dramatic company came to me to be photographed in the principal tableaux and scenes of a play which I had studied and noted with much care. It had been my experience that a recital of the text with the accompanying action and an instantaneous shot would give the desired result. I had been very successful before with the manager of the company, and in this play was especially desirous of surpassing myself. I met an obstacle in the person of the principal character in the play, who was a well-known teacher of elocution and acting. He demurred to my suggestions, and mechanically placed himself in the supposed action of the moment. After exposing the plate, I persuaded him to try it again, reciting the text and 'suit the action to the word.' The lines were addressed to a son by a parent, and were: 'I am no father to a thief!' He threw himself into the full spirit of the text and action, producing a result that excited the warm applause of the company and gave me a superb picture. Suppose I had attempted a head rest?"

The Leeds Convention and "the Iron Duke."—We had the pleasure of inspecting two photographs by Lawrence, of Dublin, at the Mayor's reception (City Art Gallery), and at the Exhibition Hall. The negatives were taken in the Library of Trinity College, Dublin, for presentation to Her Majesty the Queen. One was a photograph of a white marble bust, double life size, by the great sculptor, Sir Francis Chantrey, R.A., a very fine work by the famous artist, recalling the well-known features of "the Iron Duke," the enamelled inscription plate, shown in photograph, being affixed to the pedestal, one of a series in the celebrated College library. The other photograph depicts what may be termed an artistic record of Wellington's life and career. It is illuminated on parchment by Harry Foster Newey, one of the masters at the Birmingham Municipal School of Art. By this we learn that Wellington was born at Mornington House, Dublin, May 1, 1769, and died at Walmer Castle, Kent, September 14, 1852. There are some thirty-seven lines of Wellington's "titles and honours," bestowed by all the leading monarchs and governments of the world. At top, surrounded by a nimbus of rays, the word "duty" is displayed as being the guiding star or motive of the Duke's life and conduct. Beneath it a gracefully grouped trophy of arms and flags. Down each side runs a "riband," with the names of the leading events in Wellington's career from the time he joined the Thirty-third Regiment, down to the close, when he became "Queen Victoria's counsellor and friend." Four medallions at corners contain, respectively, portrait of Wellington, the Duke's set coat of arms, the Irish harp, and portrait of the donor of bust and record. Wreaths of shamrocks encircle the whole in honour of the great Irishman. A pretty group is made at foot of Irish emblems—the Round Tower, the Irish staghound, the Celtic cross, and the Dublin mountains for a background. Bust, plate, and record are the gift of Mr. D. J. O'Neill (himself a Dublin man), now a Birmingham resident, as the record states, with hearty good wishes for his native land. Mr. O'Neill is known to the photographic profession as the Secretary of the National Association of Professional Photographers. The gift is worthy of the great general, and is placed where it will be carefully preserved and shown to the visitors from all parts of the globe who yearly inspect the famous library of Trinity College, Dublin.

ABSORPTION PHOTOGRAPHY AND X RAYS.—The scientific interest connected with the Röntgen or X rays has brought out, through a large number of investigators, a great variety of phenomena bearing directly or remotely upon the original methods and results. While studying the work of others on the X rays proper, the recollection of an accident which the writer had in some photographic work led to a series of experiments along a line which may or may not be connected directly with the Röntgen rays. The experiments were begun about the middle of March, and are not yet finished. So far as the writer is aware, no work has been reported in just this line of investigation. The object of the experiments was to ascertain, if possible, if photographic negatives could be gotten similar to X ray negatives by the action of energy previously stored in certain bodies. The results of the experiments which are to be given seem to point very strongly to an affirmative answer. *Experiment No.* 1.—From a newspaper was taken a cut of a pair of eyeglasses, and from a glazed paper was taken another cut. These were exposed for about an hour to sunlight and were then removed to a dark room, and after cooling were placed over a common sensitive glass plate and very carefully and thoroughly wrapped in white cloth and paper, and then placed in a tight box and allowed to stand in a dark room for about one day. At the end of this time the plate was slowly developed and found to reveal the picture clearly, the one on the unglazed paper being slightly more distinct. A similar experiment was tried, using lamp instead of sunlight, and gave similar but not so strong results. *Experiment No.* 2.—At the same time that No. 1 was being carried on, a figure cut from the inside leaf of a book which had been in the dark for the most part for a year or more was, without exposure to light, placed over a sensitive plate. No results were secured in this case. *Experiment No.* 3.—Over a pine board was placed a black woollen cloth, and to this were fastened fragments of zinc, copper, graphite, silver, glass, rubber, and wood. This was exposed to sunlight for an hour, and after cooling was placed over the sensitive plate, carefully wrapped in cloth, and placed in a tight wooden box and kept in the dark room for about one day. Upon developing, only the wood and rubber showed much. *Experiment No.* 4.—On a small piece of pine board were fastened the following articles: muscovite, copper coin, mica, an iron key, and a piece of glass. The whole was then exposed to sunlight for an hour, taken to the dark room, and when cool all the articles were removed and the wood placed over a sensitive plate and thoroughly protected by wrapping in cloth and placing in a tight box in the dark room. After one day the plate was developed, and all the articles were revealed on the negative by light figures, but the iron key and the copper coin seemed best to shut out the light. Similar experiments were successfully performed by exposure to powerful incandescent gaslight and to incandescent electric light, though the results were not so intense as by sunlight. *Experiment No.* 5.—A key was placed over one side of a common Kodak roll film, and a piece of brass placed on the opposite side. These were placed in a dark box and connected with the two poles of a battery for several hours. When developed, a very faint shadow appeared. *Experiment No.* 6.—A piece of mica and an iron key were heated in an alcohol flame till the edges just began to be red-hot. They were then allowed to cool and were placed over a sensitve plate in a perfectly dark box in a dark room for twenty-four hours. When developed, there was revealed the shadow outline of each. *Experiment No.* 7.—A current of electricity from a dynamo, sufficient to produce a small spark, was passed through an iron key. The key was allowed to cool, and was then placed over a sensitive plate, in a tight box, for twenty-four hours or more. When developed, there was seen the shadow outline of the key. *Experiment No.* 8.—A fresh fern stem was placed over a sensitive plate, and, after being so kept for twenty-four hours, the plate was developed, and there was revealed the outline of the whole stem, with a much darker central portion corresponding to the circulatory system, all of which was very clearly brought out. In some of the experiments which have been mentioned there was contact with the plate, while in others equally good results were obtained without contact. Considerable skill and a rather long time were required in the developing process. The results described are but a few of those obtained along this general line of study. It will appear from these experiments that in no case did the light pass through the object to be photographed; and, further, that light is not necessary. All of these experiments, but especially those in which the objects were heated or exposed to an electric current, and subsequently cooled in the dark, indicate, first, that the photographic action is due simply to energy stored in the body to be photographed and afterward slowly given off, there being a great difference in the power of absorption and radiation in various substances; second, that this energy may be from other sources than luminous rays, if these only reach a maximum rapidity of vibration; and that, when this rate of vibration is reached, a molecular change in the silver salts of the photographic plate is started, with greater or less intensity, depending upon the character and source of the energy, and completed in the developing process. From certain researches now being made, the writer would venture the suggestion that possibly certion phenomena connected with the Röntgen photography proper may be in part explained by these general statements. He hopes to present, at some future time, a series of experiments of such a nature as to confirm this statement.—E. J. BADCOCK, in *The Scientific American*.

Patent News.

THE following applications for Patents were made between August 10 and August 15, 1896:—

CAMERA FRONT AND VIEW-FINDER.—No. 17,648. "A Combined Camera Front and View-finder." E. S. ULLMER.

FERROTYPE APPARATUS.—No. 17,772. "Improvements in Photographic Apparatus Specially Adapted for Ferrotype Dry Plates." G. H. THOMAS and B. WHITWORTH.

APPARATUS FOR DEVELOPMENT.—No. 17,819. "Improvements relating to Apparatus for Developing Photographic Plates." Communicated by W. Herrmann. Complete specification. F. W. GOLBY.

COPYING HOLDER.—No. 17,909. "The Unique Plate and Negative Printing-out Holder for Copying Photographic Negatives on Opals, Bromides, Transparencies, and Lantern Plates." I. RENSHAW.

FILMS.—No. 18,036. "Improvements in the Manufacture of Films for Photographic Purposes." B. ACRES.

KINETOSCOPIC APPARATUS.—No. 18,084. "An Improved Form of Camera and Lantern for Taking and Reproducing Photographs in Motion and Throwing same on a Screen." A. W. HARRISON.

COLOUR PHOTOGRAPHY.—No. 18,131. "Means for Reproducing the Colours in Photography, suitable also for Dyeing and Printing." Complete specification. J. A. MICHEL-DANSAC and LEO CHASSAGNE.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
31	Birmingham Photo. Society	Last Day for sending in Competition Pictures for July Excursions. Harvington Hall, Dovedale, and Astley.
31	Bradford	*Trimming, Mounting, and Framing.* P. E. Newstead.
31	North Middlesex	Informal Meeting.
September.		
1	Brixton and Clapham	Ordinary Meeting.
1	Hackney	Paper by Mr. Child Bayley.
1	Gospel Oak	*Enlarging for Members.* Messrs. Gittens and Liscombe.
2	Borough Polytechnic	Open Evening.
2	Photographic Club	The Management of a Photographic Society.
5	Borough Polytechnic	Excursion: Wimbledon and Morden.
5	Bradford	Excursion: Selby.
5	Hackney	Excursion: Sewardstone. Leader, W. Selfe.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 20,—Mr. E. H. Bayston in the chair.

Mr. FRESHWATER referred to the recent death of Mr. William England, who, at one time, was a member of the Association, and to his work in photography from the early days of its discovery to the present time.

Owing to the near approach of the closure of the Traill Taylor Memorial Fund, and the expressed desire of getting in all remaining subscriptions at once, it was proposed by Mr. FRESHWATER, seconded by Mr. HENDERSON, and carried, that the amount of the independent subscriptions made by the members be made up from the funds of the Association to a sum of five guineas.

The HON. SECRETARY introduced the question of screens for process work, and referred to a paper by Professor Burton on the photo-mechanical processes in Japan. He had recently gone into the subject of cross-lined screens. The gradations are obtained by variations in the size of the dots which compose the picture, but which are all printed in the same density. The question that presented itself was, How were these dots made of different sizes in the negative? and the opinions were that it was due to diffraction. He would like to know what those present thought about the matter.

Mr. BECKETT thought that diffraction entered into the subject, and that the more intense the light the more likely it was to spread.

Mr. BANKS said the theory was that the screen acts in the same way as a pinhole.

Mr. BULLEN pointed out that it was the custom of process workers to change the form of the diaphragm during exposure to obtain certain effects.

Mr. HENDERSON could not understand why more use was not made of irregular-grained screens instead of the ruled screens. He thought a good screen could be made by coating ground glass with a black varnish, and then grinding down again, when the varnish on the raised portions would be removed, and a screen of irregular type would result.

The HON. SECRETARY said that the holes would vary in size in such a screen, and the half-tones would not be properly translated.

Mr. BECKETT thought the blocks were not so much to blame as the printing, the ink, and the paper used.

PHOTOGRAPHIC CLUB.

AUGUST 19,—Mr. W. D. Welford in the chair.

Mr. NESBITT showed a print of the "egg-eating snake" at the Zoo. The body of the snake was so similar to the groundwork of the cage or den in which it was contained, that it was not easy to distinguish the reptile. Mr. Nesbitt said his son had taken a series of negatives of the several actions of the snake in swallowing an egg. The photographs, however, would be improved if the body of the snake could be more easily distinguished from the floor of the den. He asked how this could be done.

Mr. BRIDGE and Mr. WELFORD suggested blocking out all except the snake.

Mr. TOTTEM suggested making an enlargement, which could then be altered or blocked out and a fresh negative made from it.

Mr. Drage showed prints from a negative of the moon, taken by Dr. A. H. Fison, who used a reflecting telescope with a mirror eight-and-a-half inches in

diameter, and a focal length of ninety inches. The size of the image was eight-tenths of an inch, the plates used were Wratten & Wainwright's ordinary plates, and the exposure was one-eighth of a second with a drop shutter. The photographs were taken at Hindhead, Haslemere.

Mr. Parfitt also showed photographs of the moon made with a telescope of thirty-six inches focal length, the mirror being four-and-a-half inches in diameter. He had enlarged the negatives to two-and-a-half inches diameter. This was the limit fixed by the granularity of the dry plate he had used.

Mr. Tottem proposed, and Mr. Nesbitt seconded, a resolution that the annual outing of the Club to Hampstead should be held as heretofore, and that the members of the London and Provincial Photographic Association should be invited to join in the function. This was carried unanimously.

North Middlesex Photographic Society.—August 17, Monthly Instruction Evening, Mr. J. MacIntosh in the chair.—Mr. F. L. Pither read a paper on

ELEMENTARY COMPOSITION,

in which he pointed out very clearly the errors many photographers fell into, and how a picture was composed. One point he insisted on was that you should not build on the centre line, whether in architecture or landscape. By means of crayon sketches on drawing paper pinned to the blackboard he showed different forms of composition, sketched from memory, of some well-known paintings. In the discussion that followed, Mr. Marchant said there could be no composition in a photograph, only selection. Mr. Mummery maintained that by introducing clouds and figures a certain amount of composing could be done. Several other members took part in the discussion. After a vote of thanks to the lecturer, voting on the results of the Burnham Beeches outing resulted in Mr. Marchant securing first and second places.

South London Photographic Society.—August 17, the President (Mr. F. W. Edwards) in the chair.—Mr. Roland C. Whiting (Ealing Photographic Society) gave a lecture on

RETOUCHING AND THE IMPROVEMENT OF NEGATIVES.

He said retouching was a wide subject, and he proposed to deal only with the subject of expression, which is the chief object of retouching. Photography fell very far short of what we should like it to perform. The dry plate did not render things as seen with the eye, owing to the fact that the plate was more sensitive to those rays which are invisible. The defect is not so noticeable in orthochromatic plates, but they do not render colour correctly in every case. Many people object to retouching, and that justly, because its power has been cruelly abused. People have taken up retouching without knowing the principles which underlie the whole practice of it. Legitimate retouching is confined to very small limits. It does no more than correct the colour values of a negative. Skill depends upon knowing what to do. In teaching retouching, I find that those pupils who are taught the whole principles before they go to work get on better than those who go step by step. They are like travellers who have studied the map and know something about it. Before dealing with the methods, we must be acquainted with our tools. The principal thing we employ is a desk. There is not a proper one in the market, for the reason they compel you to lie upon the top of your work. A desk may be made so that it takes negatives almost upright with a slight slope, and at the same time at a sufficient height. The upright position will be found in a long day's work to prevent a great deal of fatigue. This necessitates some means by which the hand should be supported. A table should form a support for the elbow. A T-square set on end forms a convenient rest for the hand. (These remarks were illustrated by diagrams.) Do not lay the hand on the negative—it is bad in principle—and do not hold the pencil close to the point. Too much light is bad, as it reveals many defects which do not print, thus rendering more work than is necessary. The light should be filtered. The ideal material for the purpose is "flashed" opal, which is now rather expensive. That which gives an idea of a flame fifteen inches away is the best density. It is desirable to have means of raising the negative diagonally when necessary. The usual materials for retouching are pencils, and sometimes brushes. In France a needle is used instead of a pencil. Needlework has gone out entirely in England. At present pencils of moderate hardness, B. S. Cohen's threepenny pencils, with round leads, are the best, HB and H. HH is useful when the others are too soft. Faber's are the next best. The lead should project about three-quarters of an inch. Glass paper glued to a piece of wood is the best for sharpening pencils. (The method of sharpening was demonstrated.) Payne's grey, tempered with Indian ink, is the best material for spotting out. It gives a similar colour to that contained in the negative. Do not use too much Indian ink. This colour can be used as a wash or a stipple. The use of the knife was explained. The principles which should guide a retoucher were then explained by means of diagrams on the blackboard. In conclusion, he said, Never do too much; rather do too little. Above all, remember that the negative is nothing more than the means to the end, the result of which is a picture.

FORTHCOMING EXHIBITIONS.

1896.		
August 25–29	Royal Cornwall Polytechnic, Falmouth.	Secretary, E. F. Kitto, Falmouth.
Sept. 24–Nov. 7	Photographic Salon, Dudley Gallery, Piccadilly.	Alfred Maskell, Dudley Gallery, Piccadilly.
,, 28–Nov. 12 ...	Royal Photographic Society.	R. Child Bayley, 12, Hanover-square.
Dec. 1896–Jan. 1897	Bristol International.	

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE EXPANSION OF PAPER.

To the EDITORS.

GENTLEMEN,—I have read with surprise your extract from *Autotype Notes* upon the above subject, signed by E. W. Foxlee.

Paper, like other fabrications, has its vagaries, and is very much tampered with by its manufacturer.

In conformity with the above title, I should have expected something more exhaustive and scientific from the pen of such an authority as Mr. Foxlee; instead, we are treated to a series of dodges and shifts by which mistakes in negatives can be cobbled up or compromised in mounting! Why rush into print at all if we cannot impart even a moiety of useful instruction? The bare idea of pulling a man's broad face to make it look longer is absurd, and should not be advised under any circumstances.

I think many readers would have been glad had Mr. Foxlee given us an insight into the tricks of paper-makers and the constituents of paper itself, beginning with the fibre of the pulp in the vat, describing its nature and source, and its passage from the vat to the receiving apron, and on through the various operations until the web becomes cut into sheets, and, having done so, instruct us how to produce our work on the material without the inconvenience of encountering stretching, distortion, or contraction.

With man very few things are impossible; for instance, if I take two sheets of paper, cut from the web transversely, and paste one sheet upon the other, so that one shall be lengthways and then broadways of the web, any work produced, photograph or drawing, upon such a combined sheet, however treated, will preserve its original proportions.

Paper will only stretch to a fixed extent, no matter how long the wetting is continued; therefore, if I coat a sheet of paper with gelatine, and while it is thoroughly wet squeegee it on to a greased or chalked plate, stripped when thoroughly dry, such a sheet will not further expand in either direction, however long the contact with water continues. By this means, during the last thirty years, I have executed, reduced, and enlarged photo-litho transfers from chromo lithographic copies, extending to eighteen colours, and these, when transferred to stone, are found to register together as accurately as if drawn on stone direct. A former method of mine was to soak the sheets in water, and then glue them by the outer edges into a rectangular frame, and, when dry and cut out of the frame, it was fit for use. There is a wrinkle for P.O.P. and other sensitive-paper manufacturers by which they can supply their customers with a paper suitable for engineering and other purposes.

Photographic Works, 119, *Clonliffe-road, Dublin*, *August* 19, 1896. JOSEPH LEWIS.

THE BRUSSELS INTERNATIONAL EXHIBITION OF 1897.

To the EDITORS.

GENTLEMEN,—But little attention has been given in this country to the International Exhibition that is to be held in Brussels next year, probably for the reason that, until lately, it was wholly a private enterprise. The recent interest taken in the project by the Belgian Government has, however, invested it with considerable importance, and has converted it into an Exhibition well worthy of the serious attention of manufacturers and industrials generally. The more important of our foreign competitors have signified their intention of participating in the Exhibition. France has already made a grant of 35,000*l.*; Germany has appointed a powerful Government Commission; in the United States a grant has been made by Congress; and a large number of other countries have accepted the invitation to be present sent them by the Belgian Government. Our own Government has recently intrusted to an influential British Commission, under the Presidency of Sir Albert Kaye Rollit, the interests of this country at Brussels; and it now remains for our manufacturers to decide whether they will best consult their own interests by combining to form a representative British Court, or whether they can afford to leave the opportunity for extension of business in the hands of our chief rivals, Belgium, Germany, the United States, and France. In urging them most seriously to consider, if not the direct advantages of participation, at least the great danger of abstention, I appreciate fully the cost and inconvenience inseparable from taking part in an Exhibition; and, if the one to be opened in Brussels next April had remained the offspring of a private company, I do not think it would have been worth the attention of manufacturers. But, having been adopted by the State, the International Brussels Exhibition of 1897 takes rank among the more important of its kind; and I do not think that this country can afford to be absent, or not to be worthily represented there. This is a question for exhibitors to determine, and to determine soon, as the time at their disposal is even now restricted. I shall be obliged to intending exhibitors if they will, at their earliest convenience, place themselves in communication with me, in order that I may furnish them with detailed information. I may add that the Brussels Exhibition is universal in its classification, embracing all branches of art, industry, and science.—I am, yours, &c., JAMES DREDGE, *Executive Commissioner, British Section.*

35, 36, *Bedford-street, Strand, London, W.C.*, *August* 20, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

P. D. Roberts, 2, High-street, Shafteshury.—*Photograph of half-plate group.*

Frederick Holmes, 92, Horningsham, Warminster, Wilts.—*Two photographs of the Rev. Canon Jacob and family of Horningsham, Warminster, Wilts.*

RECEIVED.—GEM DRY PLATE COMPANY; T. G. SNOWDEN.

W. E. A. DRINKWATER.—It is not supplied commercially.

RADIOGRAPHY, &C.—ELECTRIC. 1 and 2. Yes, to both questions. 3. A thin coating of glue or indiarubber solution would probably answer.

DEVELOPER.—R. GRIFFITH (Newquay). The solutions appear to us to be too highly concentrated, hence, probably, the fog, Were we using that particular formula, we should at least double the quantity of water in each case. Try this, and let us know the result.

ORIGIN OF LENS.—S. A. E. The firm named on the lens ceased to exist some years ago. It was not the actual maker of the lenses it sold. They were made in Paris, probably by one or other of such houses as Jamin, Hermagis, or others. The lenses were, however, or such as we have seen, very good for that period.

INJURED LENS.—T. BRUNTON. As one of the glasses is "cracked right across," there is nothing to be done but get it replaced. That had best be done by the original maker. We do not know any one who would do the work cheaper than him—that is, if the original excellence of the instrument is the principal consideration.

ASPECT FOR STUDIO.—AMATEUR (Wilts). If you have a choice of aspect for your studio, you cannot do better than select north. The proportions named will do very well for amateur purposes, but for professional work, as your letter implies the studio may eventually be used for, three feet longer and two feet wider would be better.

WORKING HOURS.—SWEATED. There are no recognised hours of labour in the trade. Of course, in the case of females and young persons, where several are employed, the Factory Act applies. This is not so in your case. You should have arranged the business hours at the time you took the appointment. The law will not aid you in any way.

PHOTOGRAPHIC PAPERS.—J. HARRISON says: "There are other papers besides Saxe & Rives's in the market for chloride paper, and larger; will you kindly give me the address of the firm, as I shall require it by the ream?"—In reply: Write Messrs. Otto König & Co., 27, Cross-street, Finsbury-pavement, E.C., who are agents for the papers you want.

GREEN FOG.—GREEN FOG. Possibly the simplest plan would be to change your plates and developer. It is caused by under-exposure and forced development. To remove it, convert the deposit into silver chloride and apply a ferrous-oxalate developing solution. This is the only remedy we can suggest; but we have not much confidence in it.

BOOK ON STUDIO CONSTRUCTION.—J. M. J. NOCK says: "I am about to build a photographic studio, and would like to consult some good work, or article, upon the question." Could you recommend me to same?—In reply: Messrs. Marion, Soho-square, publish such a work, by Mr. Bolas, which will probably give you all the information you require.

CARBON WORK.—T. MACKEY says: "I have some very thin negatives which I wish to print in carbon. Could I get extra vigour in the prints by sensitising the tissue in a much stronger solution of bichromate of potash than that usually recommended?"—No, just the reverse. Use a weak bath, give a short immersion, and print in a feeble light, if you wish increased vigour.

FIXING POWER OF HYPO.—W. L. NASH says: "The article in your latest number, on the fixing power of hypo, is of great interest. I do not at all care to save expense by using the minimum quantity of hypo, but it would be of real use to me to know whether or not four ounces of commercial hypo, dissolved in a pint of water, is sufficient to fix one 10×8 bromide print."—In reply: Yes.

BACKGROUNDS.—BACKGROUND writes: "Will you kindly inform me what would be the best material for painting backgrounds upon, and also the sort of oils, as I have tried ordinary oil colours and have not succeeded very well?"—In reply: Unbleached calico or sheeting. Ordinary flatting colour, that is paint made with a large proportion of turpentine and very little oil, so that it dries dead instead of glossy. It may have an addition of japanners' gold size, which will give it body and facilitate its working.

SPOTS ON NEGATIVES.—MERCURY says: "I am greatly troubled with metallic spots in my negatives, sometimes taking the form of comets, splashes, and at others so small that they are scarcely seen with the naked eye, but are quite opaque in printing, causing considerable annoyance in spotting prints. I am using pyro and ammonia development, and am practically careful in every respect."—In reply: Send us a negative with the markings complained of. We shall then be in a better position to suggest a cause for the defect.

VALUE OF INVENTION.—INVENTOR. We can give you no idea whatever as to the commercial value of the invention, nor could we do so even if we had seen it or knew its points. The best thing to do is to search out what has been done before in the matter of instantaneous shutters—no easy task, and, if the thing is really original, obtain provisional protection for it, and then submit it to a manufacturer who would be likely to take it up. You seem *very* sanguine about your invention. May we remind you that this is the case with the majority of those who invent anything, and that they, for this reason, quite ignore what has been done before?

STAINED MARGINS OF NEGATIVES.—T. BARNES. The stains on the edges of the negatives are due to the use of stale plates, notwithstanding what the local chemist may say to the contrary. Chemists and druggists who deal in photographic goods as a rule have very little sale for them, as the majority of workers prefer to purchase from regular photographic dealers. They then ensure a greater certainty of obtaining what they require in the best condition. It is no good complaining to the makers of the plates, as it may be relied upon they were in good condition when they left their hands, and we fear you will get no more redress from the druggist. Probably he does not know that plates, and some other photographic materials, deteriorate by keeping.

FALLACIOUS PAPERS AT PHOTOGRAPHIC MEETINGS.—SCRUTATOR writes: "Is any one supposed to be in any way responsible for the papers read before recognised photographic societies? I mean, can any one read a paper, which may be the most misleading nonsense imaginable without that paper being somewhat judged of beforehand by the Committee or Secretaries? I ask the question because I sometimes see reports in the JOURNALS of papers that are erroneous to a degree."—The papers read at the meetings of the different societies are solely on the authors' responsibility, and the societies take none for them. There is a rule, we believe, of the Royal Photographic Society that all papers are to be submitted to the Council before they are read, but it is doubtful if it is acted upon.

RESITTING.—YOUNG PROF. writes thus: "Will you please tell me what is the rule with regard to the giving of resittings in London studios? I started business here in the spring, and I find that all the sitters want resittings—two, three, and four times—before they are satisfied, and they will not pay anything for them. All promise good orders if I get portraits to please them, but when I do the orders do not come off. This, of course, reduces the profits to next to nothing."—There is no set rule as to resitting in London any more than there is elsewhere. Every artist tries to please his sitters. As our correspondent says *all* his sitters require several resittings, may we mildly suggest, as he is a young beginner, there may be a good reason, on his part, for it? Be that as it may, as we have just said, there is no set rule in the matter.

CLOUDS IN CARBON PICTURES: TONING PLATINOTYPES.—J. PORRITT writes: 1. "I shall be glad if you can suggest an easy and effective way of adding clouds to carbon prints. So far my success has depended upon making a positive with clouds, and then a second negative to print from. Working up clouds on the original negative is not always a success with me. 2. Can you inform me who is the agent for the sale of Mr. James Packham's catechu powder for toning platinotypes?"—In reply: 1. The plan you have been following is the best if the cloud negatives are not the same size as the landscape negative. The working in of clouds on the original is the one most generally followed with large sizes, but it requires skill, and that is only acquired by practice. 2. We do not think there is any special agent. Better address Mr. Packhan, Katherine-street, Croydon. He will, doubtless, supply you.

PLATES BROKEN IN TRANSIT.—PLATES says: "I shall be much obliged if you will give me your opinion on the following:—In January last I ordered one dozen 12×10 plates to be sent by passenger train, and they arrived carefully packed but all broken. I advised the dealer of such two or three days later, and also sent in claim to the railway company, and later they refuse to pay damages, as the goods were not marked glass, and I refuse to pay also as they are useless, but have told the dealers I will pay for a perfect dozen if they will send them, and they refuse, and have returned them, and they will not take them in. They are now in the hands of the railway company. Have since received a County Court summons, and shall fight it out."—In reply: We are under the impression that the company are liable; but, of course, railway-company like, they will wriggle out of their liability if they can. But possibly some of our commercial readers learned in such matters will let our correspondent have the benefit of their ideas on the point.

COPYRIGHT.—COPYRIGHT says: "Enclosed print has been sent to me this morning. A number is wanted, not for sale, but to advertise an embrocation by a local chemist. This print is evidently a copy, to all appearance. Could you kindly ascertain if this is a copyright subject, as I make it a rule never in any way to cause annoyance to my fellow-tradesman. The particulars on back of print, as I received it, answer for itself. I do not know whether it is customary for you to ascertain whether prints are copyright or not."—In reply: The print has been returned. We may say that we have already seen a reproduction of this identical photograph in a popular magazine, and, if you copied it, you would in all probability not only "annoy" a fellow-tradesman, but you would run the risk of an action for infringement of copyright. We do not undertake to ascertain if a photograph has been registered. It should be worth your while to write to the Secretary of the Photographic Copyright Union, Mr. H. Gower, Photographic Section, London Chamber of Commerce, Botolph House, Eastcheap, for literature bearing on the subject of copyright—a subject in which, notwithstanding all that has appeared on it recently in this journal, you must pardon us for saying you do not appear to be well up in.

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OUR FORTHCOMING ALMANAC.

The time of year has arrived when it is necessary for us to take in hand the preparation of The British Journal Photographic Almanac for 1897. A feature of the volume for the past thirty years has been the co-operation of numerous friends and readers of the Journal, and the Editor takes the opportunity to express the hope that the support so kindly placed at the disposal of his predecessors may be continued to him.

We especially invite contributions on topics of practical interest, and should feel obliged if the articles and any accompanying sketches are sent to us at the earliest possible date.

Secretaries of Societies, and especially of those established since the appearance of the last Almanac, will oblige us by forwarding lists of officers and other details for inclusion in the Directory of Photographic Societies, in order that the list may be made as complete as possible.

The Publishers wish us to remind intending advertisers that the announcement pages of the Almanac are already filling rapidly, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

We are asked to state that Thursday, September 10, between the hours of 9 a.m. and 9 p.m., is the only day for receiving unpacked exhibits for the Annual Exhibition of the Royal Photographic Society. If packed, they may be sent at any time up to Wednesday, September 9. In both cases they must be delivered at 12, Hanover-square, W., and not at the Gallery, 5A, Pall Mall East, S.W. Full particulars relating to the Exhibition can be obtained on application to the Assistant Secretary, at the Society's rooms, 12, Hanover-square, W.

* * *

Advertising to our remarks of last week on the issue of a circular by a firm of diarists relating to the coupon system of photography, we have received a letter on the subject from Mr. Drinkwater Butt, of Carlisle. Mr. Butt, like Mr. Byrne, had also had the circular from which we quoted, and he forwards us a copy of his reply thereto. It runs: "Your circular to hand. I shall have much pleasure in agreeing to the arrangement therein proposed if, on your part, you will agree to present to each of my customers who pays 1*s.* (the price of [your] almanac) for one midget photograph before the end of 1897 one of your diaries, value 4*s.* (the price I get for a cabinet photograph), and I feel sure that 'in every instance other copies (of your diaries) will be undoubtedly ordered, and further business result, and it prove a *splendid advertisement* for *you.*' I shall, of course, 'only appoint one *diarist,*' so shall be glad to hear from you per return." Mr. Butt's rejoinder is certainly neat, apposite, and reasonable.

* * *

Mr. J. A. Kay, of Burlington Studio, 211, Lord-street, Southport, writes that he also received the circular. Mr. Kay says: "I wrote, saying I failed to see what advantage I should gain; and to-day I received the enclosed letter from them. I have, however, written to say that they had better make arrangements with some other photographer who would do something for nothing." The reply referred to by Mr. Kay is as follows: "Your opinion of our scheme is not that generally held by the leading photographers in the United Kingdom—we presume that scarcely one person in a dozen who presented a coupon to you would be satisfied with one proof. Further copies are sure to be ordered in almost every case, for which you would obtain your full fees. However, if you do not look at in this light, we will make other arrangements for your town."

The copy of yet another circular has been sent us by Mr. Alfred Freke, of Cardiff, who asks if we know anything of the mysterious process to which it refers. We do not. It will be observed that the circular refers to a secret method for preventing halation, and a charge of five shillings is asked for the information. We quote the circular: "Every photographer should be possessed of the knowledge whereby interiors of every description can be photographed without the use of any special plate or backing. All fog or halation entirely done away with—by a very simple means, and without cost—thus enabling the photographer to expose the very deepest shadow. The undersigned will forward the information (which is private) on receipt of five shillings; but so that no unfair advantage might be taken of the discovery and to enable every photographer to gain the information at the same time, I beg to intimate that the necessary particulars will be forwarded on September 10, 1896."

* * *

The backing of plates in order to obviate or minimise halation is such a simple matter, that we should be surprised to hear that any photographer had paid five shillings for information on the subject other than that which has times out of number been given in these pages. We also feel bound to add that the practice of vending and purchasing secret processes is one which experience has before now shown to have nothing in its favour.

* * *

In the early part of the year, the London process-block makers held meetings with the object of coming to an agreement in regard to the minimum prices to be charged for half-tone and line work. We believe that the prices agreed on, almost unanimously, by the trade, were 3½*d.* per inch for line work and 8*d.* per inch for half-tone. The strength of the position taken up by the process workers lies in the strict observance of the prices agreed upon and unanimity of action. We presume that the latter does not exist, as there lies before us, as we write, a quotation of 2½*d.* per inch for line work and 7*d.* for half-tone. Possibly, however, since the date of the meeting the minimum prices have been reduced by agreement

CERAMIC PHOTOGRAPHY WITH GELATINE.

Ceramic photography, as generally practised in this country, is based either upon the dusting-on or powder process, or upon the substitution process, in which a silver image is converted, by "toning," into one or other of the metals, which will yield a suitable colour when fired in the muffle furnace. There is, however, another method by which ceramic photographs can be produced, namely, by printing the image in "carbon" tissue containing a vitrifiable colour, instead of the ordinary pigments, and then developing it on, or transferring it to, the plaque, and afterwards firing it into the ware. This, at first sight, appears a very simple way of producing ceramic photographs; but it is not quite so easy as it seems in practice, as we shall presently explain.

In our last issue we gave an extract, from Eder's *Jahrbuch*, of a process based upon the latter method, as worked out by Herr Haberditzl, of Vienna. Briefly, the process is this. An oxide of a metal—the black oxide of iridium is the one recommended by the author—is ground up with water, and then added to a solution of gelatine, sugar, and water. This mixture is then poured on to levelled glass plates, and, after the gelatine has set, the plates are reared up to dry. The plates are then sensitised in a solution of bichromate of potash, and, when dry, printed in the usual manner. When printed, the film is coated with plain collodion, and then washed in cold water to remove the unaltered bichromate. Next, a sheet of white paper is laid upon the film and warm water added; then, when the film begins to leave the plate, it is stripped off and developed, with warm water, in the same way as a carbon print. After aluming and treating with alcohol, the image is transferred to the ware, and when dry the collodion is removed by a solvent. The picture is then burnt in. So far as the manipulations are concerned, they are precisely the same as those of Fargier for working the carbon process, which he patented in 1861—three years before Swan patented his method.

There is no difficulty whatever in producing the photographic image in vitrifiable pigments by the usual method of carbon printing, if those pigments be used in the tissue in place of the ones usually employed. The difficulty is to fire them into the ware, whether that be enamel or porcelain. The chief trouble is, that, as the heat is applied, the gelatine cracks, fizzles up, and leaves the plaque, bringing the image away with it in parts or entirely. Different methods have been tried for getting over the difficulty, and with more or less success. The Autotype Company did, some years ago, produce very good burnt-in photographs by the carbon process, and they showed some large sizes on porcelain plaques and tiles at one or two of the photographic exhibitions. They also, for a time, worked the method commercially, but eventually gave it up, because, we are told, there was no demand by the public for the pictures. The method by which they overcame the fizzling trouble has, so far as we are aware, not been published.

About a dozen years ago, Mr. Thomas Bolas patented a method of producing ceramic pictures by the carbon method. The way he got over the fizzling difficulty—and that formed a part of the patent—was by placing a lump of cyanide of potassium in the muffle or oven, the vapour of which tends to moderate the spitting-off tendency of the gelatine film. That was one way, but the one he gave preference to was to inject a fine spray of a solution of an alkaline salt, such as borax, cyanide of potassium, silicate of potash, &c., into the muffle.

In Herr Haberditzl's article no mention is made of the way the fizzling is prevented. It is, however, stated that a suitable gelatine is important, and that the author had made some four hundred experiments before he hit upon the right kind and the correct proportions. These are given as follows: Hard gelatine in the proportion of 7 grammes to 100 grammes of water with 6 grammes of sugar added. The colouring matter is 8 grammes of black oxide of iridium ground in 50 grammes of water until the latter has almost all evaporated. A hard gelatine, one would imagine, is not the most suitable for the work, but it is noteworthy that the sugar is in much larger proportion than is generally employed in the manufacture of ordinary carbon tissue; also that the film, when dry on the glass, must be very thin, as the quantity given, when filtered and finished, will not much exceed 4 ounces; and this, it is said, is sufficient for thirty plates 9 × 12 cm., nearly 5 inches by 4.

In case any of our readers are inclined to try Herr Haberditzl's method, it may be well to mention that the oxide of iridium is rather an expensive substance. In a wholesale price-list now before us it is quoted at eighteen shillings a drachm, and the quantity given in the above formula is some-

thing over 2 drachms; experimenting with the formula, as given, will therefore be somewhat costly. However, cheaper oxides may be employed in the preliminary experiments, the oxide of manganese, for example, the price of which is quite nominal. The oxide of manganese, if used, will give a pleasing brown colour when burnt into the ware.

A New Test for Wood Pulp in Paper.—The well-known defect to which paper from wood fibre is liable renders acceptable any test for ascertaining its presence. According to Herr F. Wolesky, diphenylamine is very useful for this end. One gramme of the latter is taken and dissolved in fifty c. c. of alcohol and five or six c. c. of strong sulphuric acid, and the sample is immersed in this solution. According to the quantity of wood pulp present in the sophisticated paper so will a more or less deep orange colour develop and increase on drying.

A New Developer.—According to M. Edwin Ackermann, in the *Bulletin* of the French Chemical Society, quinine is capable of filling a new *rôle* in photography. It is an old story how a photographer was almost driven insane by the repeated production, upon development of plate after plate, of a death's head upon the forehead of one of his sitters, and how the ghastly joke was explained by the sitter having made a preliminary sketch on that part of his face, using a solution of quinine for the purpose. It is, as we say, an old story that once used to pass current, though as to its truthfulness we will not vouch; but, according to the above-named writer, if two grammes of sulphate of quinine, eight grammes of zinc dust, and forty cubic centimetres of water are heated at 100° C. in a closed tube for ten hours, a liquid with strong reducing properties is obtained. It is stated to act as an excellent developer, producing a clear and sharp image.

Photo-chemistry and Thermo-photo-chemistry.—Under this heading is an interesting abstract in the *Journal of the Chemical Society* from a paper by Rodolfo N. Amici. The author discusses at length the various chemical changes accompanying photographic action. Although light can cause both endothermic and exothermic reactions to occur, the former only proceed, as a rule, to a very slight extent, owing to the reverse exothermic reaction setting in between the decomposition products. The usefulness of chemical sensitisers is due to their being able to act exothermically with certain of the decomposition products, and so facilitate the photographic action. In exothermic reactions the light acts merely as an exciting agent, but in endothermic reactions it plays the part of a source of energy. All endothermic photographic reactions cease when the light ceases to act, and those reactions which continue in the dark after cessation of the light action must be exothermic.

New Application of Röntgen Rays.—At the last meeting of the Paris Academy of Sciences, M. Chas. Henry described a new application that he had devised which permitted the obtaining of luminous shadows instead of the ordinary photographic results. He coats a screen with phosphorescent sulphide of zinc, and, covering this with a sheet of needle paper, places upon it the object to be radiographed. Then placing the Crookes' tube in action for about five minutes, he withdraws the screen, the zinc-covered surface of which has acquired a phosphorescence which will last for some time. The image so produced can be increased in brilliancy and prolonged for about a quarter of an hour by exposing it to dark heat radiations. Upon bringing the plate into a dark room, one can apparently see the luminous outline of the object traversed by the Röntgen rays, with all its variations of permeability represented by differing degrees of luminosity. This process is useful in those cases where it is not needful to preserve a permanent record, and lends itself readily to lecture purposes without having to wait for the development of a plate, as would be necessary if a plate had been used.

Such a process, however, would not be available for many of the practical purposes for which the Röntgen rays have already proved so very useful. For example, Mr. Watmough Webster has shown us a very interesting sciograph he recently took of an infirmary patient. The poor fellow had been working with his hands in some sand, into which some broken glass had fallen, and a number of small spicules of which had lodged in the flesh of the back of the hand. Several pieces had been removed, but he still had great pain, which he was sure was caused by one remaining piece. The surgeon was unable to find it, and, as a last resource, sent him to Mr. Watmough Webster. "I could bear the cutting," he pathetically said, "but could not stand any more probing." A negative was taken, and the patient walked off with it to the infirmary, returning in about an hour quite gleeful, with the spicule of glass removed and carefully brought in a pill-box.

The Phosphorescent Tablet.—There is no doubt that for a tablet to be used as suggested by Mr. Henry, the easiest mode of working would be to purchase some Balmain's paint, which can be obtained commercially with little trouble. The tungstate of lime recommended by Herr Arnold, as recently described by us, is best obtained in the form of the mineral tungsten. A solution of tungstate of copper in tungstate of calcium also glows with equal brilliancy as natural tungsten. A further note on the tungstate is found in Dr. Fernando Giazzi's paper. By a certain process of heating in a coke furnace in the presence of oxygen, the tungstate is reduced to a white saccharoid mass, which gives a much more brilliant glow than ordinary tungsten; but the effect can be further intensified by pulverising the mass and repeating the process, the final product, which Dr. Giazzi terms the bisaccharoid form, being, in his opinion, the best substance for shortening the exposure and intensifying the brilliancy of photographs taken with the Röntgen rays.

DIGRESSIONS.

IX.—Give the Man a Chance.

One of the most trying operations in photography is that of "taking a group." I, of course, mean the group of commerce, the wedding group, the football and cricket groups, the beanfeast group, to which I must add the Convention group. All art abandon ye who venture here; there is no use for it. All the skill of the operator must be used to keep "the heterogeneous conglomerations of human atoms" quiet. How often in his despair is the much-enduring operator inclined to shout, "Give a man a chance!" This he did at the taking of the Leeds Convention group, or somebody did for him, with remarkable effect. It is a large order to pose, even if you omit all posing, one hundred and thirty people out for a holiday, all with the fatal birthright, or acquired right, if not the gift, of photography in them; all, according to the usual teaching, the best of sitters, but all really the worst, for, the more a man knows of photography, the worst sitter is he, the worst in the world except the actor, who, by the nature of his particular branch of art—for *he* claims to be an artist, although he is only an interpreter of other men's words—always overdoes it; and the photographer, when he sits, usually tries to be quite natural, so effectively that we immediately see it is a sham.

It is in the Convention group that photographers show they are as awkward a lot of people as any they have had to complain of in their professional experience, and should lead them to have a fellow feeling for ordinary humanity when it gets paralysed by the lens and camera-shy. It will be noticed also that they are as learned in, and as fond of giving off, the usual inanities as the familiar funny man we meet with in every group. I noticed the President couldn't help it himself. And who shall blame them? They are built as other people, "warmed and cooled by the same summer and winter; if you tickle them, do they not laugh," and have the same yearning for a joke? Many of them have had what may be called the "group jokes" played off on themselves all the year; shall they not retail them at their one opportunity in the year, when they have a victim all to themselves? Shall they not find it delightful to escape from

the storm and stress of portraiture, and, instead of always striving to please their sitters, become the sitters themselves, with all their little humorous ways?

By the way, did not a dozen or so of the Conventioners at one of the excursions—York, to wit, in the ruins of St. Mary's Abbey, which ought to have compelled more seriousness—form a solemn league and covenant to reverse the usual procedure, and, instead of touting for sitters, be the sitters themselves, and send out a tout to find photographers to come and photograph them? The tout (who must have spent much of his life as a doorsman) was so efficient as to beguile most of the photographers who had any plates left. It was noticed, however, after a while, that the grounds in which the little episode took place were gradually cleared of photographers, and the news of brigands, who "compelled all creatures to their will," must have spread, for no more, I hear, came near upon whom the wily tout could exercise his blandishments.

But to return to our chances. That simple exclamation, "Give a man a chance," was perhaps more effective than any other words could be. It appealed to the tender feelings of most of those present, it was a personal appeal to those who must have been through the mill many times. The "funny man" seldom realises the mischief he does, and the possible strain the photographer puts on himself to neutralise him without offence. To do this, he has to "forsake all others," as the bridegroom is enjoined to do in the marriage service, and devote himself to the idiot. Certainly the zany may be good-tempered and only thoughtless, in which case he is easily suppressed by a few judicious words; but there are others who think their stupid jokes invaluable, and insist on letting them off whatever happens. The photographer's smiles usually hide the vexation; but under such circumstances I once picked up my camera, and said that, if they wanted me, I would return when that man had got rid of his witticisms and realised his rudeness. It was quite effective, and, curiously enough, that man was my friend for ever afterwards.

There are many certainties that are miscalled chances. One of the most annoying criticisms on his work a true artist can hear is, "How lucky you were to get that beautiful effect on your subject," particularly when he knows that the subject has been passed by many photographers, camera in hand, and not recognised as a subject at all. There are some subjects that are beautiful for a few minutes only in the day; these are not seen, or not recognised if seen, by the wandering thousands, but the artist should have the requisite perception to see the possibilities under any of its aspects, and the patience to wait; or the subject may have pictorial capacities at any time of day, given a few additions or alterations which the artist should know how to make—some figures, perhaps, or cattle, or even an added stick or stone. The usual photographer may take it as he finds it, and produce "the usual thing," the artist may make the necessary addition and produce a picture, but he ought not to be accused of "chance." This ought not to be chance at all, for chance is an event that happens, falls out, or takes place, without being contrived, intended, expected, or foreseen—a fortuitous event. Here, perhaps, we discover one of the differences between the photographer who has made a long study of his art and the one who makes merely a business of it, or who has not gone further than the usual manipulation, and could make his own emulsion while knowing nothing of the causes of pictorial effect. Neither is it the chance of the photographer who would rely on the study of other photographs only, as Mr. Child Bayley suggested in the paper he wrote (not officially) without sufficient study. The skill to drop a pebble pictorially in the right place is the result of years of study of more than unexplained photographs.

There are some chances that every photographer has a full right to expect and depend upon as certainties. These are apart from his subjects. I allude to the matter because I have five or six instances brought to my attention this year, but I will refer to one only as a sample.

When we go to a great establishment and pay a great price for our apparatus, we ought to be able to place the greatest confidence in that apparatus. This is what one of my friends unfortunately did, and what I should have done myself without hesitation. My friend, a very skilful amateur, had such faith in a hand camera by a maker who claims to be at the top that, without testing it, he took it to Northern Italy and exposed the usual grosses of films. His part of the harvest of the year consisted of these films, and a very valuable contribution they ought to have been; but, when he came to develop them at home, he found that each one was blackened over by the action of light, which entered in some mysterious manner. Now, this photographer returned from abroad on purpose to join some friends in a week's excursion to a Midland county. The defective camera was sent to the maker, who put it right, and, with profuse apologies, assured the miserable owner that there would be nothing to fear for the future. Confidence returned. He had no opportunity of developing a plate—and why *should* anybody be bothered with experiments—and exposed many dozens on splendid subjects, in most perfect weather, in the most delightful time of year. It must be remembered this was one of our most skilful picture-makers; his pictures were badly wanted; they were invaluable; the coming exhibitions will be desolate without them. These films were also found to be blackened by light, which found its way into the amended camera. Many a man has eased himself of the burdens of this wicked world for smaller misfortunes. Now, where does compensation come in? Money could not satisfy the claim. I don't mean for the wasted films, or even travelling expenses, but for practically the year's work and the disappointment of the world. This is a matter which wants settling, but the making of precedents is costly. There ought to have been no possibility of chance here. You ought not to merely "happen" to get a light-tight camera, or a good lens, you ought not to have to try whether a first-rate instrument is good before you use it. It would be no great trouble for a maker to *try* a camera before sending it out, and I give this manufacturer credit for being as vexed over the matter as his unintended victim.

Now we are talking of hand cameras, I may just whisper that another friend of mine is having one made that is expected to do everything but speak. I listen to the frequent descriptions of it with awe, and my own special, but faint, hope is that it will take a photograph. My friend is doing all he can to make it a success. He will not want it until the early summer of next year, and is already beginning to learn its mechanism from the elevations, plans, and specification. He thinks he may know something useful about it by Christmas, but I doubt it. Good intentions don't turn dynamos. I also know of other hand cameras on the stocks to be launched as the amateur fashions for 1897.

The conclusion we may come to is, shortly, this: As a rule, the best chances a man has are those he makes for himself. It is not true that the best pictures are the result of happy accidents. If it were, then that miracle would come about of the best luck happening to the same individuals for a series of years. The customary visitors to exhibitions always know from whom to expect something good, eccentric, or original. A skilful and resourceful photographer may be deprived of his usual chances, the landscape man may not be able to take his annual excursion in search of the picturesque, the portrait or figure photographer may not be able to meet with a good model, but they are not lost. Some of their material expedients may come from without; their chief dependence is within. By virtue of their skill and resourcefulness these defaults should be help to them rather than the reverse. It brings out their reserve powers, induces them to break out in a fresh place, be more original, and not only to please themselves in a new way, but startle their usual admirers by their command over difficulties. These men make their own chances, and what is called their "luck," at any rate in pictorial photography, is the result of a profound study of art, not only as circumstances permit, but as their love of it compels.

H. P. Robinson.

NOTES ON ORTHOCHROMATICS.

It is astonishing to find that thirteen years after the discovery of the principle of colour-sensitising plates by H. W. Vogel, and at least ten years after this principle was successfully applied to English made plates, anyone should be found who is sufficiently ignorant of facts or sufficiently confident of his own powers of experiment to

stand up as the champion of ordinary *versus* colour-sensitive plates, particularly for the reproduction of pigmentary colours.

I purposely state "pigmentary colours," for many of the strongest supporters and most constant users of colour-sensitive plates admit that in the summer, when natural objects are illuminated by very powerful white light, the local colour is to some extent masked, and therefore the advantage of orthochromatic plates is, to some extent, minimised.

Before it is possible to accept any tests as conclusive, it is essential that some common ground should be chosen from which to start, and, if a really valuable test is to be made, it must be not only upon pigmentary, but also on spectrum, colours.

To test the luminosity of pigmentary colours, whether in the form of coloured papers or as actual patches of artists' pigments, it is necessary that some method should be adopted by means of which, once for all, their relative luminosities should be measured. Here are three principal methods by which this may be done: First, by means of Maxwell's discs; secondly, by Abney's colour patch apparatus; and, thirdly, by Lovibond's tintometer.

Briefly described, Maxwell's method, as utilised by Rood,* is by means of discs of stiff cardboard painted with certain pigmentary colours, and matching the luminosity or brightness by a smaller disc with black-and-white sectors, rapidly rotating them till they appear equally bright. Although a table is given both by Rood and also an extended table by Church, they are both valueless, because they only represent the luminosities of the actual samples tested by them.

Abney's method is fairly well known, and consists in the use of a source of light, a shadow rod, and rotating sectors. The rod is placed at some distance from the pigment to be measured, a white surface being also placed by the side of the pigment; a shadow of the rod is cast by direct light on to the white surface, and by a silvered mirror a second shadow of the rod is cast on the coloured surface. The aperture of the sectors is now altered whilst rotating till the two shadows are equally luminous. A white surface is now measured, and the mean of the angular apertures gives the relative value of the two luminosities.

Lovibond's tintometer I am not so well acquainted with for measuring the luminosity of colours; but, as I have found it extremely useful for my private work in connexion with colour, I am sure it would answer for this also. This instrument was exhibited at the Photographic Club one night, and, if I remember rightly, it was stated by Mr. E. J. Wall, who showed it, that the luminosity of a colour could be determined by seeing how many neutral tint glasses were required to totally extinguish all sense of colour. If this is so, it seems to me to be the most convenient, because the simplest, method of measuring the luminosities, for the instrument for other work is extremely simple.

There is another important point in connexion with pigmentary colours, and that is the form in which they are used. Every one is aware of the great difference between oil and water colours when laid on canvas or paper; the former presents a much more saturated appearance than the latter, these, as a rule, being mixed with a considerable amount of white light from the underlying support of white paper, and this is still more marked with pastels. The purity of the colour then must be taken into account, for it is a well-known fact that, the more white light is mixed with a colour, the less marked a colour is, and we have only to mix sufficient white light with any colour to destroy it as colour altogether.

Possibly, because of this admixture of white light, which is so difficult to eliminate with pigments in the shape of either water or oil colours, it would be worth while to use materials such as velvet, wool, and cotton. Pure silk velvet, from its method of manufacture, as all know, presents only the ends of the fibres to the eye, with the result that the colours reflected from it are more nearly pure, that is, unadulterated with white light than from almost anything else; wool, on the other hand, reflects more white light than velvet because of the fibres being presented sideways to the eye, whilst cotton, from the peculiar non-transparent nature of the fibre, shows considerably less colour and also more white light admixture.

Turning now from pigmentary to spectrum colours, it seems to me in face of the years of experimenting by such men as Eder, Vogel, Abney Schumann, Bothamley, &c., that further tests are not required; but, assuming that they are, it would be by no means difficult to arrange a photo-spectroscope so as to obtain easily comparable results, for, having once focussed the spectrum for its whole length from the red to the violet on a plate, one could ensure a constant light, constant in so far that the errors would be spread equally of two consecutive exposures, by using either the incandescent gas of a given weight of magnesium ribbon; and, with a micrometer scale photographed on each plate, it would be quite possible to determine the sensitiveness of an ordinary and an isochromatic plate with identical exposures.

But, supposing we throw over the spectrum, on the plea that in nature we do not, as was once said, "have a spectrum hanging on every tree," a test could be easily arranged which ought to satisfy all. A sheet of wire gauze, about two feet square, could be rigged up in a picture frame, and various flowers stuck in the meshes, which would fairly include most, or at least the principal colours met with in nature. For instance, in the pansies we could find any range of purples, violets, and blues; in the rose, any range of reds; whilst in the pansies and chrysanthemums, any range of yellows might be found; whilst, for greens, there is a large variety of foliag to choose from.

For such a test as this a stereoscopic camera, with identical lenses, should be used; and, if any difficulty was found in obtaining colour-sensitive and ordinary plates of precisely the same speeds, this might be adjusted by variation in lens apertures.

Till this subject is fought out and settled once again on purely definite lines, we shall, I suppose, be still at times treated to the echolalian babble of scribblers.

PHAROS.

* *American Journal of Science and Art*, February, 1878.

BY THE WAY.

I SHOULD not again have referred to the matter of professional *versus* amateur that engaged me last month had I not gathered, from further correspondence that has reached me, that I have not made quite clear the ground I take. It seems that most of my correspondents—who by the way, are not quite so "down" on me as previous ones—imagine that I want to back up the trading amateur or "shamateur" as I called him. Far from it. All that I have said or can say that can be in any way construed as in his favour is that, whatever he may do in the way of interfering with the professional, there is no legal remedy for it. Professionals may combine in their own interests, but I really cannot see how they are to stop the pest unless they are willing to agree to a rigidly enforced tax upon photographs. That seems to me the only way to get at the evil, but I fancy the remedy would be worse than the disease.

I gather from my recent correspondence that professionals generally agree with me that the real amateur is out of the discussion altogether, and a very reasonable letter from Mr. Archibald Robertson, of Glasgow, whose name has been familiar to me for very many years, sufficiently clearly states the case from that point of view. He complains that I do not say who I am or what gives me "a position in the discussion," to which I can only reply that, as I started the discussion, I must necessarily have a position in it, and as to who I *am* for all the purposes of the discussion he has only to refer to the signature at foot. But, when he says that a better name for me would be "Dog-in-the-manger," he is not only unkind, but scarcely reasonable. However, that I can forgive, and pass on to matters on which we are both in thorough accord.

He says: "I knew the amateurs thirty or more years ago as gentlemen in every sense of the word—merchants, manufacturers, men of education, ministers, professors, &c., and there are, doubtless, many and more of them now. That kind were true amateurs, and no one need have any word but praise for them. But my experience and observation of the more recent so-called amateur photographer is that he turns it in every possible way to his own advantage, and very often directly to the disadvantage of the professional. So I call these parties *false* amateurs because they have other strings to their bow, and are taking the trade that should go to the tradesman." Now, I ask, could any one more exactly state my own expressed views than the above *verbatim* quotation?

I will pass on to another phase of the question on which Mr. Robertson and I pretty well agree; he says: "Then we have the same spirit in the dealers. The time was, when any person called at their shop to speak about a copy, enlargement, or taking a view, they would recommend one or two houses—perhaps send their boy round with them. How is it now? 'We do all kinds of work from developing to painting.' And if the picture turns out pretty well, and the 'push-the-button-man' has a handle to his name, then a fine placard is placed in the window, 'This photograph was taken by ———, who used one of our "Magnificent" cameras. Dear sir, looking round it is very like falsehood and fraud, and wilful imposition. . . .' Well, with the exception of the falsehood and fraud, &c., the case is stated only too truly; but here, again, there is no very ready remedy. The dealers have a perfect right to do as they please in the matter of copies or enlargements if they choose to undertake them, and the photographer's only remedy is in the form of boycotting those who run counter to his interests; but, as I hinted last month, I don't think that will ever prove a successful process. The professional, no less than the amateur or shamateur, likes to buy in the cheapest possible market, and the dealer, in order to give the professional his materials at little over cost price, *must* trench a little on the professional's ground to make a living. I am stating but hard, dry facts, and am not interested in standing up for either "shamateur," professional, or dealer—perhaps there is something to be said for and against each of them.

But Mr. Robertson might have said something about that undoubted "fraud," the pharmaceutical chemist, who not only deals in camera lenses and photographic materials that don't in any way belong to his business, but will undertake enlarging, copying, or indeed anything that he can turn a penny by. This is the man who goes into metaphorical hysterics if a photographic dealer sells an ounce of corrosive sublimate, and, nowadays, probably could not tell you what corrosive sublimate consists of, and only knows it as one of the "scheduled" poisons. This is the sort of man who perhaps, in ninety-nine cases out of a hundred, began his apprenticeship by sweeping the shop floor and filling pints of linseed oil in the "back place," and who in the last few months of his time managed to cram sufficient *quasi* botany and materia medica to enable him to scrape through his "exam." And this is the man, forsooth, who alone claims to be legally entitled to call himself a chemist! I have known, and know, dozens of them, who are accurately described in the words I have used, though I am quite willing to admit that there are many others who are really trained and educated men, and fully entitled to be called chemists in the best sense; but, as a rule, these are not the ones who go in for, at any rate, the enlarging business.

There are, of course, throughout the country, many firms who are both *bonâ-fide* pharmaceutical chemists, and equally *bonâ-fide* photographic dealers—firms of whom it would be difficult to decide in which capacity they are better known; but these, again, are not the ones who tread upon the professional photographer's toes or steal his trade. There is nothing to prevent the pharmaceutical chemist from dealing in what he likes, from tin whistles to artificial manures, and there ought to be equally no reason why the photographic dealer should not be in a position to supply *any* photographic requisites, whether they be poisons or not. Surely to goodness, such a firm as that of William Hume, of Edinburgh, is as competent to handle poisons with safety—and, moreover, with judgment—as a little country chemist, with the shop-floor and linseed-oil antecedents! But, no, that highly scientific body, the Pharmaceutical Society, who don't like the title of "trades union," won't permit it, and, unfortunately, have the law on their side, unjust though it might be. Here both professional photographers and photographic dealers have an undoubted grievance, for both are interfered with.

Talking of country chemists, I have personally had many amusing, if annoying, instances of their vagaries. A few months ago I happened to be in a country town in the midlands, boasting five or six thousand inhabitants and two chemists' shops, in the window of one of which I saw the well-known blue pyro bottle. As I was in want of pyro, I entered, and asked for an ounce, when a youth of three or four-and-twenty, not an apprentice, and I should say not the proprietor, for he put on too much "side" for the latter, took the bottle out of the window, and disappeared behind the scenes to wrap it up. After an unconceivably long absence, he reappeared, and placed the usual neat paper parcel, duly labelled, before me. "What's this?" I asked. "I want an ounce of pyrogallic acid." "That is it, sir." He had actually taken the trouble to scoop out the contents of the bottle, which, no doubt, *he* took to be a pound. As it was the only one they had in stock, I had to take it, without, however, giving him the trouble to replace it in the bottle. "How much?" I asked—it was Schering's—and, after much reference to price-lists, as usual on such occasions, the reply came, "Four and six, please, sir!" Needless to say, I did not pay that; but I could not, with any amount of persuasion, get it below eighteen pence.

On another occasion while travelling I wanted some quinine, so I asked at the chemist's, "What's the price of quinine? I only want a small quantity, say, a drachm." Directing his eye into the corner of the ceiling with a sort of calculating look, the assistant replied, after a few moments, "Half-a-crown, Sir." "Half-a-crown an ounce? Oh, I only want a drachm." "Half-a-crown a drachm, halfpenny a grain," came the reply. "Hang it all," I said, "I can get it at two shillings an ounce in London." "Doesn't matter what you can get it for in London, that's Mr. ——'s price here, and you'll have to pay it." I explained as politely as I could under the circumstances that I really could not afford it, and at the next place I stopped, a large town, I got it at two shillings an ounce.

Good old pharmaceutical chemist! With all your faults, and though you are not generally beloved by photographers, you are sometimes very amusing to DOGBERRY.

PHOTO-MECHANICAL NOTES.

NEXT in interest to the question, Who invented the enamel process? is another, which has, no doubt, often occurred in the minds of process workers: Why use fish glue? It does seem the oddest thing conceivable, yet everybody uses it because every one says it is the thing to use. This is generally the case with photographic formulæ, and no one troubles to seek the reason why.

We have seen, according to my last article, that a variety of other substances can be used, in preference, or in conjunction with, fish glue. Prominent amongst these is gelatine; and, knowing that the process depends upon the well-known action of bichromate upon a colloid body under the influence of light, it seems strange, at first thought, that gelatine, one of the purest of the colloids, should not be used in preference to a semi-putrid chondrin like fish glue.

Gelatine certainly can be used; it can be treated in a similar way, and can be carbonised by strong heating until it is insoluble in the usual etching fluids. But gelatine has two or three disadvantages. In the first place, it solidifies when cold, and must be kept heated whilst being used for coating; secondly, it does not keep long when mixed with bichromate; and, thirdly, it cannot be developed in cold water. These disadvantages might be minimised or overcome by working under suitable conditions; for instance, by keeping the gelatine warm whilst coating, by making it up freshly, and by developing with warm water. But, granting this, it must further be urged as an objection, that gelatine does not give as sharp dots in the half-tone print as does fish glue, unless the negative is very keen in contrast. If there is the slightest tendency to raggedness in the dots on the negative, or if they are not so well joined as they might be in the high lights, there is a vignetted action on the gelatine, which makes it difficult, if not impossible, to wash out the print clean and sharp. With fish glue, it is easier to wash out, owing to its greater solubility. Vignetted action is hardly possible, because nothing very short of full exposure will allow the glue to adhere to the plate during the washing out.

It is for this reason that the idea of using carbon tissue for the half-tone process is dropped almost as soon as it is tried. It is too difficult to get clean-edged dots, and it cannot be worked with such facility and rapidity as a fish-glue solution in the hands of an expert printer. Moreover, the sensitised tissue must be in very good condition and carefully exposed, or it will be leathery, and will not

stick to the metal. I once heard the suggestion made, that a carbon tissue should be made with fish glue, but this would obviously be impossible, by reason of such a film being soluble in cold water. It would not be possible to sensitise it, nor could it be soaked previous to squeegeeing.

In this connexion, I notice that a French writer, Villain, suggests a transfer-paper process, in which the paper backing is to be destroyed in the carbonisation of the gelatine surface after it has been squeegeed down to the metal. But I feel sure such a process would present considerable difficulties in working. For instance, before the transfer was made to the metal, the image would have to be washed out until it was a mere stencil on the paper; if there was the slightest veil of gelatine between the dots or lines, it would carbonise with the image and render etching impossible. Any one who has worked either carbon tissue or photo-litho paper will know how extremely difficult it is to avoid this veil between the lines or dots, unless the negatives are of the most perfect character.

The objections which apply to processes with gelatine apply equally to any variations of the formula with ordinary glue or isinglass. It must not be forgotten, however, that it is possible to convert gelatine into meta-gelatine, in which state it loses its property of solidifying when cold. This meta-gelatine, it is generally known, can be formed by prolonged boiling, or by treatment with acids or other suitable chemicals. But, though meta-gelatine will give fair results at times, it is vested with a considerable amount of uncertainty. A meta-gelatine prepared with acid appears to retard the action of the bichromate, and does not hold well on the metal, whilst that kind produced by boiling seems to lose all its tenacity, and will hardly hold together during development. I have tried to make a permanently soluble gelatine by treating it with chloral hydrate, but it gives a starchy-looking substance of a very rotten character for forming a film, though it may do very well, as originally suggested, for mounting purposes. Looking at the matter all round I think it must be admitted that gelatine and ordinary glue, however treated or applied, are not advantageous substitutes for fish glue.

Among departures from the beaten track may be mentioned the use of lichen starch, such as Iceland or Caragheen moss, which, when boiled with water, forms a jelly, and may be utilised in conjunction with fish glue to give the latter a little more body. Vegetable products offer a more promising field for investigation in respect to this process than do gelatines and glues, the starchy and albuminous matter forming glutinous substances which seem suited to the purpose. One of the most likely things which occurred to me was an extract from linseed, somewhat akin to linseed mucilage; but, though it printed rapidly and washed out well, there were other troubles which rendered it unfitted for use in this process. It not only gelatinised when cold, but it became insoluble, and the more one tried by heating to melt it the more insoluble it became, as if the heat, in conjunction with some property in the stuff itself, caused the bichromate to act without the aid of light action.

Another substance I have heard of as being used, is a size extracted from Scotch seaweed. Of this I have no experience, but agar-agar, a kind of gum extracted from a seaweed found in Ceylon, was one of my trial substances. It, however, decomposed when heated to the necessary degree for forming an enamel.

With gums several practical processes have been evolved, and, as I pointed out in my last article, the original burning-in process was founded on a gum film, and to this day gum is used in preference to fish glue by many of the best American workers, who claim that it washes out more readily, and so gives sharper work, whilst at the same time forming a harder resist. The gum formula, however, requires a good deal of experience before it is manageable. To begin with, unless the very finest picked gum acacia is selected, the film formed by the gum solution will be difficult to develop, and will probably crack in drying or in the burning in.

It would seem that what is wanted for this process is a gum that is rich in arabin, which constitutes the most soluble portion of the gum, being, in fact, soluble in its own weight of water. As this arabin may be precipitated from its aqueous solution by alcohol, it is easy to get it even from an adulterated sample of gum acacia or gum arabic.

Some workers add albumen to the gum; it is claimed that this prevents the film cracking. This is intelligible only on the assumption that the albumen in such case is not in solution, but simply in a fine state of subdivision, which gives a slight granularity to the film. It may have been remarked that the addition of a little very finely ground lamp-black or Indian ink to the sensitive solution, whether of gum or fish glue, greatly aids the adhesiveness of the image to the zinc during the etching, and I take it that the albumen in either the gum or the fish glue has much the same action. It really breaks up the continuity of the glue film into a sort of network, so that there is less "filminess," so to speak, and therefore less liability to peel off. I think Mr. W. B. Bolton remarked the same thing, in writing on the *Carbon Process without Transfer*, some time ago in this JOURNAL, the pigment in the gelatine being a distinct advantage apart from its property of colouring.

In practice, it is found that a fish-glue solution which contains albumen gives a film which does not swell up in the washing out; it holds together better, and so permits more washing being given to develop sharper dots.

It has been suggested to add to the glue a resin made water-soluble by digesting with a caustic alkali. I have had no experience of this, but I hardly think a perfect mixture would be secured. An addition more likely to be successful would be the so-called "water varnish," made by boiling white lac with borax and carbonate of soda. It would, however, have to be well filtered, as it gives a good deal of sediment.

Another idea is to add finely powdered bitumen to the glue solution until an emulsion is formed, but I don't think the individual who suggested it ever carried it beyond the stage of a mere idea.

The addition of sugar to the solution, though often suggested, is an unnecessary elaboration and of doubtful advantage. It may also tend to make the film hygroscopic, so that in damp weather the trouble of the plate sticking to the negative may be experienced.

The keeping of the glue is a matter that should be carefully studied. Although it is preserved with a strong antiseptic, which I believe is essential oil of wintergreen, there is no doubt it undergoes changes in the degree of viscidity and cohesiveness, especially in hot weather. The former can be corrected by testing with hydrometer, and adding more or less water when making up the solution, and the latter by the addition of one grain of pure chromic acid per ounce of the whole solution, or a similar quantity of chrome alum.

A solution when made up seems to work best after standing a day or two in an open vessel, and Turati, who has investigated the subject, believes that a tendency towards putrescence is an advantage rather than otherwise. He suggests the addition of a little of a known putrescent sample to a fresh solution.

One hears a good deal about the acidity of the glue being accountable for faults in working, but I have never found it so. The cause for the troubles must be looked for in other directions. It is a common practice to add ammonia to the solution; but, if this is done in excess, it destroys the cohesiveness of the glue and tends to promote putrescence too rapidly.

Taking it all round, fish glue only needs proper handling—which is more a matter of experience than anything else—to secure as fine or finer results than can be obtained by any other medium.

WILLIAM GAMBLE.

WASHING PRINTS.

THEORY says that silver chloride is entirely soluble in a solution of hyposulphite of soda, with the formation of a hyposulphite of silver soluble in water, consequently the removal of these salts from our prints should be a very easy matter. Practice says this removal in its entirety is very difficult to achieve, and Messrs. Haddon and Grundy, whose interesting and careful experiments in this direction are so much appreciated, conclude the entire removal of silver from the lights of the prints is impossible, if the prints are to be left uninjured; moreover, the amount left is, under favourable conditions, sufficient to degrade the lights, and so ruin the print. Mr. Watmough Webster, in a recent article in this JOURNAL, goes carefully through the whole matter, but does not state if he can ensure the production of un-

changeable silver prints, although he has some that have stood the test for a good many years.

To all intents and purposes, not only one, but many silver prints have been made permanent, and it is said that a thing to be repeated *must* conform to some rule or other, or it could not be repeated; therefore, as practically permanent silver prints have been made many times, there is a rule, if we only knew what it was, to ensure the permanency and beauty of all our work. Now, the only conclusions we can draw are, that either the silver salt exists in a state unaffected by exposure to light and air, or is absent altogether in dangerous quantity from those prints that have stood the test of so many years' existence. Now, the tests of Messrs. Haddon and Grundy were made under more favourable conditions than are likely to exist when *quantities* of work have to be got through by a number of *employés*, whose chief aim is more frequently than not to get the work out of hand as expeditiously as possible. Still, if with the most scrupulous care some silver salt is left in the print sufficient to be harmful under certain conditions, less favourable ones are unlikely to improve matters. There is quite a formidable list of reasons why prints may vary in permanency, both as regards mere discoloration or actual fading, that apparently go through exactly the same processes. Suppose we enumerate some of them. Primarily, there is the negative itself, that may vary in all degrees from dense and hard to soft and delicate, from bright and crisp to flat and foggy; some that may require hours of exposure to sunshine, others that will be over-printed in a few minutes in the shade. The image formed on the paper would vary with each kind of negative; and it has been proved over and over again that thin, rapidly printing negatives produce less permanent prints than plucky, bright negatives do. This indicates the kind of negatives best adapted to produce permanent work.

Then, again, the paper may vary in quality and preparation, of which the user can know very little about, as he merely judges by results. To these two primary conditions are added the various chemical processes, and the crude or clever ways of carrying them out, each print has to undergo before it finds its ultimate resting-place in frame or folio. The proofs, being printed, are washed much or little, or not at all, in plain, salted, or alkaline waters previous to toning, which may take place immediately or hours after, during which time the prints are soaking. The toning may be of many descriptions, according to the fancy of the worker, and the time of colouring may vary from a mere dip to hours, with a corresponding variation in the amount of deposited gold. The washing before fixing may be much or little. The fixing bath may be strong or weak, the hyposulphite of soda used pure or very much adulterated. The prints may be immersed many together or singly, and remain in it for a long or short period, kept well separated or left in masses. They may be taken out of the fixing by handfuls or singly, and put to wash in the same way, the soluble matter removed quickly and thoroughly as possible, or left to soak in a smaller quantity of water without any care. The washing water may be hot or cold, and continued for a short or long period, which practically completes their preparation. The mounts and mountant have also considerable effect in the permanency for photographs, or, rather, a silver print. With all these varying conditions in the production of a print, it would be something wonderful if the results were anything like uniformly good—it would be idle to expect it.

Experience has pointed out the best lines to work on, and the certain dangers of other methods of procedure. I will not go so far as to say only one method will produce a permanent result, as many variations may be made with equally good results, but there are certain important conditions that cannot be safely neglected, and these are *thorough fixing* and *thorough* and *rapid* washing.

Thorough fixing can only take place in a *fresh* solution of good hyposulphite of soda of sufficient strength, and the washing in both cold and hot water, frequently changed, for a couple of hours. Of course, with gelatine papers, the hot water must be omitted. Washing all night, although it may be rendered imperative by the system adopted with various large producers, is undoubtedly detrimental. Prints left washing from Saturday to Monday are invariably duller than those more rapidly done. Why? is a question worth considering. There is no comparison in an albumen print for colour and clearness if rapidly washed with one that has had a long soaking. The quickly prepared one is much better all round—brighter and better in colour. Long soaking probably sows the seeds of decomposition that develop to the destruction of the print when the conditions of storage become favourable to the change.

A *weak* hyposulphite bath is, I think, wrong in principle and wrong in practice, as the silver salt is insoluble, or only partially so, in weak solutions of hyposulphite, which has been proved many times. Longer immersion of the prints will not compensate in any satisfactory manner for a stronger solution. I have before me, as I write, test prints that were specially prepared and perfect in all respects as prints when they were made and fixed in two baths of weak hyposulphite. In eighteen months they began to show yellow patches, and were very yellow in two years after preparation. It is now about eight years, and they have suffered little alteration since then. The sky and delicate shadows have somewhat faded, but the prints are tolerably bright otherwise. Prints fixed in strong baths at the same period, and treated in the same manner, are quite unchanged, the only difference being the strength of the fixing solution. During the past thirty years I have made repeated trials, the advantage always being with those treated with the strong baths, and, I may add, short but thorough washing afterwards.

EDWARD DUNMORE.

OUTSIDE STUDIO WORK.—IV.

IN a previous article I referred to the difficulty experienced in the photographing of horses at close quarters when such were moving rapidly across the field of view.

When dealing with such in a position at rest or free from motion, but little difficulty will be found in securing them steady, provided some suitable stratagem be employed to attract their attention just at the moment of exposure. Of course, some animals will be found that are more fractious than others, but an attendant who is well conversant with the characteristics of a horse will well know how to coax or deal with him in many respects outside the ken of those unacquainted with the habits of such. As a rule, it will be found that much will depend on the selection of a suitable place to photograph them at, and, in some respects, horses are like human beings, *i.e.*, they have their good and bad points, or, in other words, look better in some situations or poses than in others.

Owners may be good judges of horses, but they all have an idea of their own, that their animals look best in a certain position, and therefore, when such have to be photographed, it is wise, from a business point of view, to give effects to any little weakness that they may display in this respect, even although such may not coincide with the ideas of the photographer from an artistic point of view, for in this, like many other things in ordinary life, the old rule holds good, "that he who pays the fiddler is entitled to choose the tune."

Nevertheless, in this particular there is little doubt that it is wise to yield to these little weaknesses, for any photograph, executed in direct opposition to a desire openly expressed, is sure to prove unsatisfactory, no matter how technically perfect such may be. It is therefore good form, before beginning operations, to have a quiet chat anent the best points connected with the animal being dealt with.

This may mean the selection of a high or low standpoint for the camera. As a rule, however, a low standpoint is not a good position to select, because it is very liable to show off to disadvantage a weak back or shoulder in a horse. Nevertheless, it has its advantage at times, but in all cases it will be found best to get the opinion of the owner or those in charge as to the most advantageous position to work from.

This being decided upon, there remains merely the employment of some little stratagem whereby the animal's attention is strongly attracted just at the moment of exposure.

Some animals differ in this respect: those that are very sensitive to sound are best dealt with by blowing a shrill whistle just at the moment the cap is ready to be removed; this will, in nine cases out of ten, cause the animal to prick up his ears and look intently and earnestly just in the direction of the sound. This is the moment to expose the plate, and, when all is ready beforehand, failure to catch this excellent pose or expression seldom happens. In other cases it will be found that some horses are very keen to the attraction of sight, and, when such have to be dealt with, the better plan is to adopt some stratagem that appeals to this sense. All being in readiness in other respects, such as the animal being placed in the selected position, the shutter drawn, and the cap of the lens in hand, let an attendant stand close by the party blowing the whistle, and, at the same moment, wave violently a white handkerchief; this never fails to attract the horse's attention and yield an opportunity for exposing the plate.

Into the details of how to operate beyond the securing of the best pose of the horse, I need not enter. With the fast plates of the present day, and a lens well stopped down, work can be executed at very close quarters, by a rapid hand exposure, using a pad, not a cap, in such a brief space of time as half a second. For such rapid exposure by the hand a pad is much preferable to a cap on the

lens, thereby lessening the liability for any vibration. To some this advice may seem trivial, but any one not accustomed to the use of a pad when exposing can form but a poor idea of the speed such permits an operator to work at.

Such are among a few of the points necessary to be observed when dealing with animals.

In outside working, there are many other subjects that offer considerable trouble when they come to be actually dealt with, but which, until then, would appear to offer no great difficulty in accomplishing. Among such may be mentioned the photographing of tall spires, or high houses, where such can only be dealt with from the level ground in close proximity to such.

To many this may appear a very easy operation, but it is just about as trying a bit of work as ever falls to the lot of an outside operator, provided the same has to be executed in the daytime, when any bustle or stir in the way of street traffic is present. At least, I know from experience that I dread this class of subject more than any other that falls to my lot. To execute such from a high standpoint, or from the top of neighbouring houses, is a matter of considerable ease, even supposing such entails the climbing upon the roofs of houses, for, once the camera is up and in a position, the remainder is easy, and one has peace to work at from his isolated position, but the trouble of working from the street level is very great indeed, and, in some instances, insuperable.

First, there is the ever-moving crowd of vehicles and pedestrians, in all sorts of positions and distances from the camera, and, when such are taken into consideration, in conjunction with the use of the swing back of the camera to bring the spire or top of the building into the field of view, and the necessity, therefore, of stopping the lens well down to gain sharpness at all points on the plate, we have a combination of circumstances that is, indeed, very difficult to deal with. This class of work requires the use of a good shutter, and a small stop and a shutter exposure in confined situations are conditions entirely opposed to good results, no matter how rapid the plate may be.

In work of this kind hardly two subjects will be found alike. In cases where it is possible to get at a reasonable distance from the main object, the difficulty is not so great, because it permits of the camera being used without the same being tilted up in front, a wide-angle lens and the rising front of the camera being in such instances all that is needed to get the view on the plate, and this permits of the swing back being dispensed with; but, in cases where such has to be undertaken at such close quarters as makes it imperative to tilt the camera and use the swing back, a small stop must be employed to gain sharpness.

The best advice I can offer, under such circumstances, is to obtain the use of a covered van or other vehicle where any one can operate outside the view of the prying public, and, having placed the same at the spot selected as the most suitable, proceed quietly to rig up the camera inside on some convenient stand unknown to any one passing along, and then patiently wait until the view contains no obtruding vehicle or pedestrian; but, even with all this, the work is one that is attended with great difficulty, and hence the desire on the part of most outside operators to undertake the same very early in the morning, before any stir or bustle is afoot, or at such other special times when such traffic is at its minimum.

In quiet, outside places, where there is but little traffic, of course the difficulties are not nearly so great, although but few places will be found even in small villages, where there are no idlers present. In such cases the services of an assistant and one or two friends sent out and posted at the most convenient points in front of the camera, so as to arrest and attract the attention of any passer-by just at the moment of exposure, will prove of immense service in getting over the trouble of people walking across the field of view just at the critical moment.

The difficulty lies, as I have said, in crowded thoroughfares, when working at close quarters from the street level, and at times these troubles are well-nigh insuperable.

On occasions advantage may be taken of some alterations going on to neighbouring houses, or, in cases where stages are rigged up in suitable positions, to important edifices, but it is only resident photographers, as a rule, that are able to take advantage of such opportunities. When such occur, they should never be ignored, for they are a great benefit, and often permit of results being obtained that otherwise would never be secured. T. N. Armstrong.

THE PHOTOGRAPHY OF THE FUTURE.

[Photographisches Archiv.]

Colour Photography by a New Method.—Joly's method is based upon the following procedure. A screen, ruled alternately with red, yellow, and blue lines, is placed in front of a bromide plate. The plate is developed and fixed in the usual way, and a glass positive is produced from it. If this is laid correctly upon the coloured screen, so that the lines exposed through the red again come under the red lines, a picture in natural colours is seen. By this means we obtain by a single exposure that which in three-colour printing is only obtained by three consecutive exposures.

This process may be modified in the following manner. In process work the shape of the stop plays an important part. Every space in a Levy screen acts as a pinhole camera, and forms a picture of the lens stop. If we use a square stop, the dots in the negative are square; if the stop is triangular, the dots are triangular. If we use a stop with several openings, and the screen is properly placed, we do not get as many dots as there are spaces in the screen, but as many times more as there are openings in the stop. For the new heliochromic process a stop with three openings should be used. The first is covered with a film of blue gelatine, the second with yellow, and the third with red. Each of the triple dots of the process negative will therefore be obtained by blue, yellow, and red light. As blue light is more active than yellow and red, the corresponding aperture in the stop must be smaller than the others.

The negative obtained in this way is quite similar in principle to Joly's. But how can the positive so obtained be translated into colour?

The analogy with Joly's method, however, again applies. A dotted screen with red, yellow, and blue dots may be made to correspond with the positive, and the correct position of these dots may be determined by making the exposures through the red, through the blue, and through the yellow aperture of the stop successively.

Another process of reproducing the colours can be based upon the projection of the picture through the screen and the three-coloured stop.

A New Theory of Light (?)—It is known that light is an undulatory motion, but it is not known in what manner the chemical process gives impulse to this undulatory motion, as, for instance, in a flame-emitting light. The comparison with a string set in motion by a blow, or with waves produced on the surface of water by a stone, is, perhaps, sufficient for schoolboys, but it is insufficient for optics in its higher aspects.

In a treatise "Concerning Some Properties of Jellies," R. E. Liesegang speaks of "rhythmic reactions" [see *Naturwissensch. Wochenschrift*, 1896, p. 353]. He permits, for instance, a drop of an aqueous solution of silver nitrate to fall upon a stiffened solution of gelatine that has not yet dried. The salt penetrates the mass, and its gradual progress can be recognised by a clouded circle, which is produced by the chemical combination of the silver nitrate with the traces of impurities in the gelatine. If this cloudy appearance is examined with the microscope, it is found to consist of extremely fine dull lines, placed concentrically round the drop. These are interrupted by equally fine clear lines. The dull lines, which Liesegang, for want of a scientific name, calls "A lines," succeed each other at equal intervals. In the space of a millimetre their number is about ten. Similar structures may be obtained with other salts. For instance, the A lines form very beautifully if a very strong solution of silver nitrate is allowed to penetrate a gelatinous jelly, to which has been added a very small quantity of ammonium bichromate.

Whence come these lines? Perhaps we may infer from them that the chemical process is not continuous, as hitherto accepted, but that it takes place rhythmically. Perhaps all chemical action proceeds rhythmically.

In a jelly the rhythm is proportionately very slow, as the reaction proceeds slowly. In burning a gas, the supposed rhythm may be so quick that it produces the undulations of light. Water may have a retarding action in chemical processes occurring in aqueous solutions, but less than in jelly. Consequently from the slower rhythm the somewhat larger undulations of radiant heat are produced. Ahriman.

DYES AND PIGMENTS IN PRACTICAL PHOTOGRAPHY.

III.

Photographic Ray Filters.—Even colourless glass may in time acquire a distinct power of selective absorption of light rays. This property, which has been long known, is supposed to be due to the fact that glass-makers, in order to produce colourless glass, were in the habit of adding a small quantity of peroxide of manganese (glass-maker's soap) for the purpose of correcting the slight greenish colour caused by the presence of traces of protoxide of iron. The pink colour imparted by the manganese being complementary to the green colour of the iron oxide, the result was a complete neutralisation of colours by each other. Unfortunately, both manganese and iron compounds are very sensitive to light, and the equilibrium so delicately adjusted by the glass-maker is soon disturbed by prolonged exposure to light, with a consequent reappearance either of a yellowish or pinkish hue. The elaborate experiments of Gaffield, communicated to the British Association in 1872, established the fact that the change in all cases leads to a deepening of tone, so that the result is always an acquisition and never a loss of colour. Many of the glass-makers have now given

up the practice of using manganese, and oxidise the ferrous oxide to the almost invisible ferric compound by the addition of arsenious oxide. There is no doubt, however, that photographers have in the past suffered seriously from this practice, even optical glass not being always exempt from a distinct tendency to become yellowish in sunlight. The presence of a slight trace of lead is said to prevent this change.

When we come to consider the colours of non-actinic glass as used for dark-room illumination, it is necessary to remember that there are two distinct methods of imparting colour to glass, viz., either by adding the colouring principle to the molten mass, as in pot-metal, or by merely giving a superficial coating, as in flashed glass. The two varieties are at once distinguishable on looking edgeways through a small piece of coloured glass. Ruby glass is always flashed, for otherwise the colour would be so deep as to be almost opaque. Cuprous oxide is the usual colouring matter employed for ruby glass for photographic use, but gold-purple also produces a ruby tint. The absorptive power of commercial ruby glass varies so considerably that no sample, however deep the colour, should be considered safe without either a spectroscopic examination or a preliminary trial with a partly shaded sensitive film. The spectrum of ruby glass should show no trace of green, but some specimens are so inferior that even blue rays are freely transmitted. This is notably the case with ruby glass coloured with gold-purple. Green glass is generally pot-metal, and the colour is imparted by a mixture of cuprous and ferrous sulphates. In these days of colour-sensitive films, it is difficult to say what is absolutely safe; but, if a combination of ruby copper glass with either cobalt or green be used, as recommended by Abney, there will be very little danger of fogging even with the most sensitive films.

Photographers often have occasion to use substitutes for coloured glass, in the shape of dyed papers and fabrics. The danger of many of these substances bleaching in the light is already too well known to need more than a passing caution. The properties of some of the colouring materials which have been used for this purpose are given in the accompanying table, which I cannot claim, however to be by any means complete, but is to be taken rather as an example of the properties which the photographer should examine in the selection of non-actinic colours.

Substance.	Colour.	Solubility.	Permanence.	Rays Transmitted.	Remarks.
Chrysoidine	Orange ...	Alcohol	Fugitive	Green, yellow, and some blue	An azo colour.
Fuchsine.....	Red	Water	Very fugitive	Red and some violet...	An aniline colour.
Aurin	Red	Alcohol	Fugitive	Red, yellow, green ...	A phenol colour.
Dragon's blood	Red	Alcohol, ether, and oils .	Fugitive ?	Green, orange, yellow.	A vegetable resin.
Gamboge	Yellow.....	Alcohol, naphtha	Permanent ?	Yellow.....	A vegetable gum.
Brazil wood	Deep yellow	Hot water, alcohol ether	Fugitive	Yellow, red, green.....	Becomes scarlet with potash.
Lead chromate	Canary ...	Potash.....	Permanent	Green, yellow, and red, and some blue	Solution is orange red.
Potassium bichromate	Red	Water	Fugitive on paper	Yellow, red, and some green	Unaltered in aqueous solution.
Turmeric	Yellow.. ...	Alcohol	Fugitive ?	Red, orange, yellow, and green	
Xanthorhœa	Orange ...	Alcohol	..... ?	Orange	Makes a good transparent orange film.
Saffron	Yellow.....	Water	..... ?	Yellow, orange, and red	

Amongst the continually increasing number of red and yellow dyes, which the chemist is almost daily bringing to light, there are, doubtless, many which will prove even more useful for adiactinic purposes than those which enjoy an older claim to photographic consideration.

Coming next to the question of screens for orthochromatic photography and three-colour work, we find three distinct methods in use, viz.—

1. Coloured gelatine or collodion films.
2. Coloured glasses.
3. Liquid cells.

It will be convenient to summarise the chief advantages and drawbacks of each of these methods.

Coloured films, either of gelatine or collodion, are easy to prepare of any desired tint, but most of them are liable either to fade or lose their transparency. A simple method is to colour an ounce of amyl-acetate collodion with five grains of aurine or of "golden yellow" aniline, filter carefully, and flow on to thin plate glass. A more structureless film is said to be got by colouring benzole crystal varnish with turmeric, annatto, and kamala. In using mixtures of colours, however, care must be taken to avoid the production of black, even to a small extent, as this would involve a positive loss of light without any selective absorption at all.

The second method—the use of coloured glasses—has this great objection, that such glasses are extremely difficult to procure of uniform and suitable tint. Liquid cells, however, can be made of any desired thickness and filled with solutions which are practically unalterable in sunlight. Taking the internal width of these cells as one-eighth of an inch, we have the following formulæ for screens of different tints:—

YELLOW SCREEN.

Potassium chromate	1 part.
Water	300 parts.
Potassium hydrate.....	A trace.

VIOLET SCREEN.

Cupric chloride, concentrated solution	7 parts.
Ammonium hydrate	5 „
Water (distilled)	17 „
When filtered, add	
Methyl violet β	3 „
Fuchsin δ.....	5 „

ORANGE SCREEN.

Cobalt chloride, concentrated solution	15 parts.
5 per cent. solution ammonium bichromate .	25 „
Ammonium hydrate	3 „
Water	35 „

GREEN SCREEN.

Nickel sulphate, saturated solution.

Even liquid cells should not be filled with aurantia, primuline, or chrysoidine, on account of their tendency to alter in tone under the action of light. One great advantage of liquid cells is the ease with which the depth of colour may be regulated by dilution to suit any length of exposure that may be required.

Dyes and Pigments for Dry Plates.—One of the simplest uses of pigments in the dry-plate process is the application of some non-actinic colour to the back of the plate to prevent halation. The qualities required in a good backing medium are, in addition to complete absorption of actinic rays, a good continuity of film and perfect optical contact with the glass. The backing should also be easily removable by a sponge before development. Innumerable pigments have been used for this purpose, one of the oldest and most efficient being burnt sienna mixed with gum and glycerine. Neither lamp-black nor burnt sienna should be used in water only, owing to the imperfect optical contact and liability to become detached in minute particles causing pinholes in the film. If used as a varnish, the removal of the pigment is difficult without the use of special solvents, such as benzole or turpentine. Spanish brown does not give a continuous film, and annatto has the disadvantage of being insoluble in water. Some of the transparent colours have been used with success, such as aniline brown, aurin, collodion, and chrysoidine varnish, the colour being allowed to remain, if necessary, to give greater printing density to the negative.

The inconvenience of plate-backing speedily led to an attempt to prevent halation by film-staining. Saffron and logwood have both been found to give perfect freedom from this evil, although the sensitiveness of the film is apparently lowered by their use. Carey Lea has advocated a solution of red litmus for this purpose. He did not find the sensitiveness reduced, while the colour turns blue-

and washes out during alkaline development. He likewise found that an alcoholic solution of coralline was beneficial with collodion emulsion plates. Pigment has also been applied to the plate as a coloured substratum beneath the sensitive film, but it is somewhat difficult to avoid the penetration of the colouring matter into the film above, with a corresponding loss of sensitiveness. This difficulty was overcome by Mr. C. F. Oakley by colouring a substratum of gelatine with a solution of potassium permanganate, which not only renders the gelatine insoluble, and therefore not liable to affect the sensitive film in contact with it, but also, being destroyed by the processes of development and fixing, is without any influence upon the printing qualitives of the negative. J. VINCENT ELSDEN.

ROYAL CORNWALL POLYTECHNIC SOCIETY.—PHOTOGRAPHIC DEPARTMENT.

REPORT OF THE JUDGES.

THE Judges again congratulate the Society on the continued success o the photographic department; although there is a falling off in some o the classes, there is a considerable increase in other sections. There are many contributors of very high merit, and well worthy of very careful attention. The greatest falling off is in landscapes, which is, in a measure, attributed to the early date in the season for the Exhibition; this has been noticed in previous years when it has occurred.

First in the catalogue is the name of Mr. J. H. Coath, of Liskeard, who is represented by a large collection of pictures, mostly of small size, of the *genre* order, which show great skill, taste, and perseverance; a very amusing series is *After the Circus*. The same artist has several animal studies. Mr. Percy Lancaster, of Tonbridge Wells, shows a goodly number of examples, but the Judges are of opinion that they are not so good in quality as other work of his that they have seen before.

In the work of Mr. H. Yeo, of Plymouth, there is a very marked improvement to former years, and to a very beautiful portrait study, *Glayds*, has been awarded a second silver medal; the subject is very tenderly treated, and does great credit to the artist. He has several other exhibits; noticeable is one, *A piece of Groundsel for Birdie*.

Mr. Fred Marsh, of Henley-on-Thames, seems to make a special study of flashlight work, which he has quite made his own, the results obtained seem to leave nothing to be desired; for his pictures, Nos. 623 to 628, take a first bronze medal; they represent the interior of smiths' shops, furnaces, &c; also noticeable are kitchens of a dosa house in the east end of London. Mr. W. Norrie is represented by three frames of studies.

In the animal class, Mr. W. H. Pugh has been awarded a first bronze medal for a picture of dogs, viz., *Lady Minnie and Litter*. The whole of his pictures are of a very high order, and for technical excellence would be hard to best.

Mr. W. J. Anckorn shows some very careful work; also Mr. J. Smith. Mrs. Annie Blake shows several frames of flower studies, which are fairly good. Mr. A. Jane, of Bodmin, sends some flower and fruit studies; one frame of flowers he calls colour photography, evidently he means it as a joke. Mr. Albert Durn sends four examples of his work. Mr. S. N. Bhedwar is represented by some of his well-known figure studies. Mr. W. M. Warneuke has been awarded a first silver medal for his charming *genre* picture, *Work and Play*. It reminds one of the work of Mr. H. P. Robinson; it is a work of very high order, and fully merits the award bestowed upon it. Messrs. S. Bolas & Co., of London, take first bronze medal for architecture interior subjects, which shows careful work. The same firm show some work by the three-colour process (collotype) which is perfect and also effective. Mr. G. Lafayette, of Glasgow, receives a first silver medal for portraiture. *The Countess of Mar and Kellie* is one of the finest. He has also several others of the same order.

Mr. C. M. Wane has been awarded a first bronze medal for instantaneous work, athletic sports, foot races; the result is perfect.

Mr. W. M. Harrison, of Falmouth, is represented by a varied selection of his work. One is a very fine autotype enlargement of His Worship the Mayor of Falmouth. Another example of his, *A Cornish Fisherman*, taken direct, is a very fine study of an old salt with a weather-beaten face. His other exhibits are very meritorious. Mr. W. J. Byrne, of Richmond, Surrey, is well to the front, as usual. His examples of home portraiture are of the highest order, and faultless in rendering and very natural, and a first silver medal is an award well earned. The same gentleman contributes some large direct portraiture of equal merit in his well-known style, also some exceedingly good examples of instantaneous photography, *The Richmond Horse Show of* 1896. His studies of children are also well worthy of attention. Messrs. J. Chaffin & Son, of Taunton, send a large collection of very good work, but do not appear so happy as in some of their subjects of previous years.

AMATEUR SECTION.

There are several exhibits in this department of hand-camera work Mr. A. J. Orchard shows some careful work, also Mr. B. Carter, but his work is somewhat at fault, the printing being a bit too inky to do justice to the negatives; also, in the same class, are examples by Mr. J. A. Gill and others, but Mr. C. F. Inston is the winner of the award in this section for twelve hand-camera pictures, which are very artistic and well selected, and of Mr. A. W. Gill, Mr. Stanley Norton, and Mrs. James Blamey; the latter is highly commended for her work. The Rev. H. B. Hare, of Frome, sends three pictures fairly good, but a little too heavy in the printing. The Judges are of opinion they would have looked better in platinotype. Mr. Edgar R. Bull sends several very fine examples of architectural photography, both interior and exterior, for which he has been awarded a second silver medal. His productions are perfect. Dr. W. Page May, of London, shows some perfect landscape work of Oriental subjects, which are soft, and brilliant, and well treated, and they came off with a second silver medal. Mr. A. Fellows's interior of the nave, Ely Cathedral, is a fine example of interior work. Mr. H. Tonkin, of Penzance, contributes two good enlargements, which take first bronze medal. Mr. C. S. Baynton sends some good pictures of architectural work. The Rev. C. V. P. Keene is represented by some fairly good examples of enlarging. They would have been better had they been a little more brilliant. Dr. W. Page May also sends for inspection several albums of Eastern scenery, well worthy of attention.

PHOTOGRAPHIC APPLIANCE DEPARTMENT.

Messrs. Spratt Bros., of Hackney, London, exhibit a fine collection of apparatus, including cameras, tripods, printing frames, &c. Their half-plate camera is a good little instrument, and can either be used as an ordinary camera or can be converted into a stereoscopic camera; the front is so arranged that the lenses can be separated or brought closer together for near subjects as required, which is very important. Their turntable head of tripod has a locking arrangement, which can be put to use when the camera is in position, which is very important. For this camera and stand a first bronze medal has been awarded for the improvements. In tripods, they have a great improvement, viz., a self-locking arrangement, which does away with buttons, &c. The workmanship in the whole of their exhibits is of the highest order, even in their cheaper sets first-class work is predominant.

Messrs. Thorn & Heddle, of Camberwell, London, show their new patent acetylene gas generator. The Judges have put it to a practical test, and find it works perfectly, gives a good, steady light, without further attention after it is once started. This generator is for the lantern; a second silver medal has been awarded. The Judges hope to see next year their other generator for house lighting, which will be looked forward to with interest.

FORTY-SIX YEARS OF PHOTOGRAPHY.

ABOUT sixty years ago a boy in his "teens" left the home of his fathers in Markinch, Fife, and journeyed to Edinburgh, where he served his apprenticeship as a carver and gilder. No one, even the most prophetic, then dreamed that Geo. Mackenzie would, ere many years, become one of the pioneers and fathers of photography—an art-science which was then in embryo. Young George, after working some time as a journeyman gilder, came to Paisley to be foreman to Mr. William Cross, picture-frame maker, Gauze-street. Although frame-making was his trade, the youthful aspirant spent many a leisure hour in drawing portraits in crayon. He started business on his own account as a carver and gilder at 16, High-street, but, like many another young man, George, in these his early days, had not yet found his true vocation, for, while not engaged with his business, he was always experimenting with the infant art. Even after he had drifted from making frames to making pictures so difficult was the process, that one or other of the chemicals would unaccountably go wrong, and the premises have to be closed against sitters, until by repeated experiments the "fog," to his relief and joy, cleared away. Thus he went on taking pictures of his friends for amusement, until one day a gentleman who had been often taken in the back green insisted on paying half-a-crown for his portrait—a glass "positive," and so the artist's trade began.

Daguerre in France, and Talbot in England were still alive; the former the discoverer of the process by which the so-called Daguerreotype portraits were produced, the latter the discoverer of Talbotype (or calotype) negatives from which other pictures could be produced. George kept his eyes and ears open to all that was being said and written on these very interesting topics. By-and-by he resolved to construct a lens and try to take a portrait himself.

The lens by which his first picture was taken was composed of an ordinary watch glass cemented to a piece of plate glass, the cavity thus formed being filled with water. It was a difficult matter in those days to get a lens made; there were no large works specially devoted to their manufacture as now. Mr. Mackenzie's first lens was made for him by Mr. Liddell, chemist, who had the corner shop at St. James's-place, a gentleman who took a practical interest in the new art which was then in its infancy. After the lens was made, a brass-founder had to be sought out to make the fittings for it.

In the year 1850 Mr. Mackenzie made a start as a photographer at 16, High-street, Paisley. At this time he was not only the first photographer in Paisley, but also in the West of Scotland.

A friend has kindly sent me a literary curiosity in the shape of one of Mr. Mackenzie's early circulars. It is written in copper plate and is

headed, "New Crystal Palace and Paisley Portrait Gallery," and sets forth (somewhat grandiloquently) that "there are few of the discoveries of modern science more interesting and agreeable than that of photography. By its means the lineaments of those near and dear to us are taken with almost the rapidity of thought, with inimitable fidelity and characteristic expression. From the introduction of photography down to the present time, the art has vastly improved, and now it has attained a state of perfection of which few had any idea. The improvements made have had the effect of considerably reducing the charge of production, and likenesses of those we esteem and love can be had at a rate so low as to afford no room for the plea of inability to defray the charge."

After thanking his customers for patronage received since he commenced to "take coloured photographic portraits on glass," he proceeds to intimate that he "has erected a large and commodious glass house in which he can take portraits in all seasons, sunshine or shower, thereby avoiding the many disadvantages which people were exposed to by sitting in the open air." Then follow complimentary paragraphs from *The Paisley Journal* (first published in 1853), *The Post* (a Paisley edition of a Glasgow newspaper), and *The Glasgow Gazette*, all of which have long since departed this life.

About fifteen years after he started, Mr. Mackenzie removed to more commodious premises, which he had built for himself at 5, Gilmour-street, and which he no longer designated a "Crystal Palace," but simply a "Studio." At first Mr. Mackenzie's photographs consisted of "coloured portraits on glass," or "positives," as they were called by Sir John Herschel, to distinguish them from "negatives," a name which has now become very familiar. The positives had the lights and shades as in nature, while in the negatives they are reversed. The positives were coated on the back with black varnish, and were generally placed in a cheap brass mounting and enclosed in a little book-shaped case, lined with velvet like a jewel case. Most of us possess one or more of these relics of the past, the portrait of some one "near and dear" to us. If a lady, she will be dressed in a much-beflounced skirt distended with crinoline, and a coal-scuttle bonnet on her head, and be seated beside a table on which is placed a book and a vase of flowers. If a gentleman, he will be standing beside the same table resting on it his right hand, while in his left he holds the same book, and looks altogether as uncomfortable as a student-preacher before his presbytery. The portraits were freely coloured with dry paint, any jewellery on the "sitter" receiving a plentiful supply of gold lacquer to made it conspicuous. We do not place these pictures in prominent positions, but mostly keep them stowed away in our private drawers, where we can ponder over them once in a while when nobody is looking.

The introduction of the system of taking prints from the negatives ended the reign of the positives. These prints were mounted on small cards, and were called by the French *cartes-de-visite* or visiting cards—now known as C.D.V.'s. These became immensely popular, and for many years there was a great run upon them. Albums to hold them were in brisk demand, and the question of the hour was, "Have you had your *carte* taken?" This fashion brought much work to the photographers, and more entered the field. In Paisley Mr. Mackenzie still led the way, and did a large and increasing business, the high reputation he had earned for the excellence of his productions bringing him sitters from far and near.

Mr. Mackenzie had in succession, for assistants, Mr. John Fergus, who afterwards became the famous Largs photographer, Mr. Charles Fergus, now a photographer of high standing in Greenock and Dunoon, and Mr. William Brown, who now occupies a leading place among our local photographic artists.

I recollect seeing somewhere an old advertisement by one of our earliest photographers which is worth quoting. It was prefixed by the familiar lines of Burns,—

"O wad some power the giftie gie us
To see oursel's as ithers see us;"

and the reader was informed that he might obtain this coveted privilege by appyling to "Stephen Young & Sun, Photographers, West-street, Paisley." The modern professors of this art of self revelation still work in partnership with the sun, (and are very much at his mercy too) although they do not acknowledge it so frankly as did Stephen.

The early *cartes-de-visites* were taken by what is known as the collodion wet plate system. The introduction of the dry-plate system about the year 1878 gave an immense impetus to photography, and simplified the process and lessened the labour of it (especially for outside work), so much so that amateurs began to try it, and gradually became an ever-increasing band until now they are numbered by the thousand.

About the year 1880, Mr. Mackenzie started a "Studio" in the outskirts of Edinburgh, but this venture proving unsuccessful, after a two or three years' trial he gave it up and returned to his old quarters in Paisley. There he continued to labour until the present summer, taking pictures of notable events and notable people as the years slipped away. He had been working in his chosen profession for the long period of forty-six years and time began to tell upon him, as it does upon us all. His fingers were no longer so nimble nor his steps so elastic as of yore, and on May 28 last he bade farewell to the familiar scenes of his long and well-loved labours, and retired from active life, leaving his business in the hands of Mr. J. D. Ritchie.—*Renfrewshire Gazette.*

THE AFFILIATION OF PHOTOGRAPHIC SOCIETIES' LECTURES.

In connexion with the affiliation of photographic societies, six lectures, illustrated by means of the optical lantern, will be delivered, commencing each evening at eight p.m.:—

Monday, October 5, at 12, Hanover-square, W.—*Lantern-slide Making*, by Mr. J. A. Hodges, F.R.P.S.

Tuesday, October 6, at 12, Hanover-square, W.—*Negative-making*, by Mr. Chapman Jones, F.I.C., F.C.S., F.R.P.S.

Wednesday, October 7, at the Photographic Club, Anderton's Hotel, Fleet-street, E.C.—*Pictorial Photography*, by Mr. A. Horsley Hinton.

Thursday, October 8, at 12, Hanover-square, W.—*Architectural Photography*, by Mr. H. W. Bennett, F.R.P.S.

Friday, October 9, at 12, Hanover-square, W.—*Intensification and Reduction*, by Mr. John McIntosh.

Monday, October 12, at 12, Hanover-square, W.—*Hand-camera Work*, by Mr. W. Thomas.

Admission is free to members of affiliated societies and their friends by tickets, which can be obtained from the Secretary of any affiliated society. Members of the R.P.S. can obtain tickets from R. Child Bayley, Secretary, 12, Hanover-square, W.

The lectures, with the slides, &c., illustrating them, will be placed subsequently at the disposal of affiliated societies, before which they can be read. Applications to borrow them should be made without delay, stating convenient dates.

THE CHEMISTS' EXHIBITION.

Last week an Exhibition promoted by the *British and Colonial Druggist* was held at the hall in Argyle-street, which in previous years was devoted to Hengler's Hippodrome, and most of the leading chemists' sundries and wholesale houses were represented. Now that chemists are entering more into the field of photographic supplies, one could not be surprised to find photography being represented to some extent. Messrs. Reynolds & Bransom, of Leeds, exhibited a fine outfit for X-ray work, including a four-inch coil, the so-called focus tube and the neat little actinometer, if one may term it so, made of aluminium, for testing not only the rapidity of plates but also the activity of any particular tube. The Blackfriars Photographic and Sensitising Company made a good show of portable dark rooms and developing sinks, besides the Anschütz hand and stand camera, and a new and very neat hand camera manufactured by Griffiths & Co., for whom this firm are sole agents; this hand camera, called the "Cyclist," is put up in two kinds, one at 30*s.* and the other at 50*s.*; the latter has a single lens with iris diaphragm, actuated from the outside, with time and instantaneous shutter. The plates are carried in sheaths, which are provided with projecting pins at the lower corners which travel in a slot, each plate being released in turn by lifting a spring lever on the top of the camera, the plates falling into the bottom of the camera It is simple in design, extremely neat in appearance, and very light and well suited, not only for the class after whom it is named, but for ordinary work also. Several of the wholesale firms, like Barclay & Sons, J. Sanger & Sons, also showed cameras, plates, and papers, and Messrs. Burroughs, Welcome & Co., had a goodly show, very tastily exhibited, of their photographic tabloids.

Our Editorial Table.

Der Halbtonprozess.

By "Julius Verfasser." Translated into German by Dr. G. Aarland. Wilhelm Knapp, Halle a/S.

This work, forming Vol. XXIII. of the *Encyklopädie der Photographie*, is a translation from the English. The *Practical Manual of Photo-engraving in Half-tone on Zinc or Copper* was published here in 1894, under the *nom de guerre* of "Julius Verfasser." Dr. Aarland has not only translated, but made valuable additions to the work, thus including recent practical improvements in the process and the results of the scientific investigations of the basis upon which it rests. The first part deals with the arrangement of the workrooms, screens, cameras, and other apparatus. The second part treats of the negative, the preparation and etching of the plate, &c. The treatment of the subject is clear and concise throughout, and we can recommend the work as a reliable practical exposition of the half-tone etching process.

The Photographic Worker.

By John A. Randall. Published by the Author at 42, Tonsley-hill, East hill, Wandsworth, S.W.

The central idea of this pamphlet is trades unionism and co-operation as applied to photography, and the author is animated by an apparently earnest desire to improve the lot and condition of the

photographic assistant, whose position only too frequently excites our compassion. Of such Mr. Randall has more than once pleaded the cause in our Correspondence columns, and he amplifies his advocacy in the pamphlet before us. He recommends assistants to join the National Union of Shop Assistants, 55, Chancery-lane. Union and combination are his remedies for the sufferings of his clients. Amateurs and "Polytechnic" photographers, in the opinion of our author, adversely affect the position of operators and assistants, and some hard things are said of the treatment frequently received by subordinates at the hands of their employers. Here is what he says on the subject of competition amongst employers: "Besides the unfair competition amongst workers, the competition amongst employers also brings down the rate of wages. The employers are as unorganized as the assistants, and, in consequence, they are driven to adopt a policy of cutting prices; this, of necessity, results in a reduction of profits. Directly profits fall, the employer will try to recoup himself by lowering wages, and, if the *employés* are unorganized, they have no power to resist this reduction, and are forced to submit. The average employer firmly believes that the money taken from wages is so much gained, but a greater error was never made. It would not be difficult to prove that, with very few exceptions, the employers paying the best wages are also doing the most work, and commanding the highest price for their work. Likewise, the employer who always contrives to pay a few shillings per week above what others are paying in wages will always have the pick of the labour market, and hence his work will always surpass his rivals. It would be easy to bring forward many instances of houses of business which owe their supremacy and affluence to the generous treatment of *employés;* and others where, this policy having been withdrawn, the business has declined with the leaving of old assistants. Few employers seem to think that their commercial success depends largely on their assistants; but such cannot be denied by any one who has examined with any closeness the rise and fall of commercial houses."

There are black sheep in every flock, and therefore we need not be surprised to find that some employers do not treat their assistants very well. But of what trade, profession, or calling, cannot the same be said? Hard as the lot of the photographic assistant frequently is, we are satisfied that, taken as a body, professional photographers are humane and fair dealing, and as anxious as other business men to recognise and encourage merit in their *employés*. Mr. Randall lays stress, and rightly so, on the insanitary conditions under which work sometimes has to be carried on; but, in our own pages some months ago, a charge of this nature was preferred against a photographer's establishment, to which we made it our business to pay a surprise visit, with the result that it appeared to us that the surroundings of the *employés* could not reasonably be complained of. We are in perfect sympathy with Mr. Randall's objects, and trust his efforts will result in benefiting those who deserve to be benefited, but the failure of the Photographers' Benevolent Association and other movements does not inspire us with high hopes of his success.

The Spook Ballads.

By W. Theodore Parkes. London: Simpkin, Marshall, & Co.

A two-shilling edition, in paper covers, of this collection of clever lays and ballads has just been issued. The first edition was referred to in these pages about eighteen months ago, and we are pleased to learn that the high opinion we then formed of Mr. Parkes' powers has been borne out by the favour the book has since earned. The author is known to many photographers, who, with a much wider circle, cannot but appreciate Mr. Parkes' witty verses and spirited illustrations. Most of the former are admirably fitted for recitations.

The Tropical Plate.

Gem Dry Plate Company, Willesden, N.W.

The "Tropical" plate, which is the latest introduction of the Gem Dry Plate Company, is made to withstand an abnormally high temperature of the developing solution. Some of the plates having been forwarded to us, we accordingly put their heat-resisting properties to the test. We employed solutions of varying temperatures—the maximum being 180° Fahr.—and arrived at the result that, in our hands, the films perfectly resisted a temperature of 120° without betraying the least inclination to fill, "run," or leave the glass. In special circumstances—such as those obtaining in tropical climates—where the employment of very hot water is necessary or unavoidable, the property of the Gem "Tropical" plate of remaining impervious to an exalted temperature should render it extremely useful.

Naturally, this plan of working, if adopted in ordinary circumstances, necessitates an important modification. Heat being an accelerator of chemical action, it it is obvious that, where a hot developing solution is used, one's preconceived ideas on the subject of exposure require revision. Such, in fact, was our experience in using these plates, the exposure for which had to be very greatly reduced compared with what would have been the case if a developing solution at the usual temperature had been used. The subject here suggested—that of the influence of heated developing solutions in the reduction of exposure—is probably worth following up.

The "Ideal" Sensitised Paper.

F. B. James & Co., Richmond, Surrey.

Messrs. James & Co. have sent us samples of their albumenised sensitised paper, which is said to be prepared by an entirely new process. We have tried the paper, and, so far as we were able to judge from the quantity sent us, found it yielded excellent prints.

Catalogues Received.

Bender & Co., 126, George-street, Croydon.

Enlargements by the bromide, carbon, and platinotype processes constitute, according to the list we have received, Messrs. Benders' principal productions. The prices charged appear to be reasonable.

Baker & Rouse, 375, George-street, Sidney.

The catalogue of this well-known Australasian house compares very favourably with the catalogues of the leading dealers at home, both in size and in the variety of the goods listed. Over a hundred well-printed pages are devoted to setting forth a rich stock of the very latest things in cameras, lenses, chemicals, cards, printing papers, sundries, &c. Some useful notes and hints on printing, &c., complete the catalogue which is well produced, and is, doubtless, found handy by both professional and amateur photographers in Australia.

News and Notes.

Messrs. Bender & Co., of Croydon, received at the Photographic Convention of Germany, at Trèves, last week, the first prize, silver medal, and diploma, for enlargements, finished and unfinished.

"The Avenue," a monthly illustrated magazine devoted to Education, Association, and Social Progress, will appear in October. The price will be 3*d.* The publishers are Messrs. Simpkin, Marshall, & Co.

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., on Wednesday evening, September 9, at eight o'clock. Members' Open Night.

Messrs. Percy Lund & Co., Limited, have removed their London warehouse and offices into enlarged premises at 3, Amen-corner, Paternoster-row, just opposite the passage into Stationers' Hall-court, in the heart of the old publishing centre.

We are sorry to learn that Mr. John Geddes, the old and esteemed servant of Mr. John J. Atkinson, 37, Manchester-street, Liverpool, in the capacity of traveller for over eighteen years, died on Saturday, August 22, aged forty-eight, at Liverpool.

At a photographic exhibition held at Willesden on the closing days of August, twenty-one medals were offered for competition by Messrs. Badger & Co., artist colour manufacturers, of 192, Broadhurst-gardens, West Hampstead. Commenting on the large number of medals offered, a friend writes: "I propose that a competition should be opened, awarding prizes to photographers who have had the moral courage *not* to win medals."

Messrs. R. J. Appleton & Co., of 58, Manningham-lane, Bradford, have acquired the photographic material department of Messrs. Percy Lund & Co. Messrs. Appleton state: "The stock which has thus come into our hands, combined with our own—already a very large one—makes us the holders of one of the largest stocks of photographic materials, apparatus, &c., in the country. We have also a considerable trade with the magic lantern and its several ramifications—loaning slides, supplying Brin's oxygen, &c."

The British Aluminium Company have already started the production of aluminium at their works at Foyers, and, according to *Aluminium and Electrolysis*, the quality has been found to be exceptionally good, and compares very favourably with the foreign metal hitherto sold. It will be remembered that the Company, who are now the only manufacturers of the metal in the United Kingdom, met with serious opposition when their proposal for utilising the famous falls became known. The works, however, have now been successfully started, the chief engineering feature being the water tunnel, which is 9 ft. in diameter, and is driven for half a mile through very hard rock. The pure aluminium used in the manufacture is prepared from bauxite, obtained from the Company's mines in Ireland, a factory having been erected at Larne for its production from the crude stone.

PLATES SHOULD NOT BE TOO FAST, BUT JUST FAST ENOUGH.—It is the tendency of most makers of the present day to produce gelatine dry plates of extreme rapidity, and I suppose there must be a great demand for such, owing, perhaps, to a great majority of photographic studios being situated in central positions, and thereby deprived of good daylight by obstructive buildings and dense, smoky atmosphere. Also the growing tendency to use artificial light for portraiture makes it more necessary to have a plate of great rapidity. I am sensibly aware of the great value of the extra-rapid plate to the professional photographer, but, although it enables one to produce tolerably good photographs under circumstances otherwise unfavourable, it has not improved the excellence of the results, I think, but the contrary. I mean that, as a general rule, where the slower plate can be used, the negative is of a much superior quality. An impression flashed upon a very sensitive film, however carefully developed, is never, to my mind, the same quality as the well-timed exposure. One has only to compare instantaneous photographs with those by time exposure to see the vast difference in the quality of the results. The excellence of photographs depends very much upon a correct exposure, and with the slower plate the margin is greater and therefore easier to gauge, the development is also quicker and easier, giving a more perfect value of light and shade, and a finer texture.—H. ROWLAND WHITE, in *Photographic Scraps.*

THE POSTER FAD.—One of the quaintest of the fads that remain with us is the freakish and fantastic "poster" fad. The poster fad is *sui generis.* Its sins are all absorbed for art's sweet sake, its crudities overlooked for a certain flaring originality. The men whose names go knocking the edges off the corridors of fame in poster lore are geniuses of a particularly morbid and flamboyant description. They are dabblers in colour possibilities, rioters in tint, revellers in fantasy. For the realities they have neither use nor respect. Exaggeration is their *forte,* nightmarish effects their studied theme. The most commonplace objects assume under the Mephistophelean touch of the poster artist a grotesquerie almost diabolic. When the poster artist draws a woman, she is either a mermaidish freak of femininity or a weird creature of the beauty that haunts the dreams of delirium. His men are long-limbed and herculean giants of an animal soddishness, or gnome-like monsters who scowl like the villains in the old-fashioned melodramas. Poster contrasts are sharp. The blacks and shades cut like a knife, the colours sting like a whip. Outlines are accentuated, perspectives abolished—the result a mad carnival of design, that it must be admitted is not wholly devoid of an exotic attractiveness of its own. How long this poster craze will last, who knows? Just now it is at its height. Weird dames of ancient Venice pose in lackadaisical fashion on the handbills of the magazines, Circean nudities trail their charms over the bill-boards of the theatres, mermaids of large-eyed seductiveness flaunt their sinuous torsos in announcements that flame with the merits of a new soap. Where will it all end? What will be the outcome, what its ultimate influence on normal, healthy American [and English.—EDS. *B. J. P.*] art?—*Philadelphia Call.*

USES OF HYDROFLUORIC ACID.—An important article, by Herr Carl F. Stahl, upon the commercial aspects of this chemical, recently given in the pages of the *Chemical News,* concludes by a brief account of various industrial aspects of the use of the commercial acid, and, as many of them would be available in the photographic laboratory, we give here an abstract of them: "The oldest and, up to the present time, most extensive application is for etching on glass. For this purpose it can be applied in three different ways—in the gaseous form, by suspending the articles to be etched over a mixture of fluor spar and sulphuric acid. This is the oldest way of etching, and I believe most burettes, graduated cylinders, &c., for laboratory use, are still marked in this way. If applied in gaseous form, the acid leaves the surface opaque, while the liquid acid leaves the surface smooth and transparent. For the production of an opaque surface with liquid acid many empirical formulæ are published, and every glass factory, or, rather, every etching boss, has his own secret formula. But they all aim to produce a mixture of hydrofluoric acid with a fluoride of ammonia, or potassium, or sodium, with which a number of other substances, such as sulphuric, acetic, or muriatic acids, or ammonium, or potassium sulphate, &c., are mixed; but it seems quite unnecessary." It may be noted that some years ago we gave a recipe for such a mixture or etching ink, in which sulphate of baryta was used, and we found it a very useful opaque etching material, the baryta giving it a body enabling it to be used with a quill pen, subserving, in fact, the same uses as a gum added to ordinary black writing ink. It appears that lead glass only requires an acid of half the strength desirable for a lime glass, and needs less time than to do the necessary work. It is further pointed out in the article that it is important that the article to be etched and the etching fluid should be at a temperature of about 50° C.—*English Mechanic.*

THE DISCOVERER OF ZINC ETCHING.—But few of the readers of this journal (*The American Art Printer*) know that photo-zinc etching and photo-lithography, in so very many ways the same thing, were invented by two different men at almost the same time, the one being in England, the other nearly on the opposite side of the globe, in Melbourne, Australia. It was in the year 1859 that Mr. Osborn, of the Survey Department of Australia, sent a young man to England to confer with Sir Henry James about the new Australian method of reproducing and making printing plates for publication. Sir Henry James was surprised that the method was so very much like his own invention, which he made (nearly) by accident, and he showed the young man some very good prints, and told him the story of how he came to invent this great medium of modern reproduction. According to a book on zinc etching, published in 1862, by A. D. C. Scott, Sir Henry James was visiting friends at Ryde, on the Isle of Wight, and made the acquaintance of a young lady artist who had great skill and talent in copper etching. She mentioned to Sir Henry James that it would be of great advantage to the public if there could be a way of producing art subjects in a cheaper manner than that of copper etching or steel engraving. That idea roused in Sir Henry James the desire of finding some means of duplicating the etching made originally by the artist, so that prints might be obtained in quantity. After trying several methods of fixing a picture on a metal plate, he tried to make a print on chrome carbon paper, which process was used at that time (1859) in photography. He prepared the paper, printed a picture on it, then inked it in and developed it, and obtained a very nice copy, which he transferred to a sheet of zinc. He further prepared and etched it, and his pleasure knew no bounds at the satisfactory result he attained in etching his plate deep enough to print many thousand copies from it. He began to improve his method day by day, and in a short time he found himself over-worked on reproducing old manuscripts and masterpieces of ancient art. Handwriting of Edward I. and the Great Doomsday Book, written in the year 1086, at Winchester, were among the first great works of reproduction by this invention. Day after day new treasures of art of long-forgotten masters, authors, and celebrities came to light, and brought refinement and education to mankind.

THE CUSTOMER TO BLAME.—It seems strange to us that that the photo-engraving trade should be in its present condition in this day of pictorial advertising, ten cent magazines which are hardly to be classed as anything else than picture books, which are bought to be looked at, not read—when the "dailies" bring out their supplements of half-tones in black and in colour, and their articles illustrated with line cuts, not to speak of the three or four-column cartoon. The amount of illustrating is constantly on the increase, and the trade is rapidly becoming a money-losing occupation instead of a bread-winner, that is, of course, for the heads of the concerns. The *outsider* asks, "How is that possible? The demand for photo-engravings is enormous. Why, even the cheap novels have their ornamented covers and their half-tone text illustrations," but the *insider* (the conscientious one), who has his eyes and his ears open, can tell you in a few words. But the easiest way to teach is by illustration and a little simple mathematics often settles a heated and long dispute. What constitutes the cost of a plate? Let us go somewhat irregularly into the process of manufacture so as to bring the vital point at the end. There is the cost of metal and wood for blocking and the cost of the blocking. There is the polishing of the metal, the coating and preparing it for the print. There is the making of the negative and the coating and turning. There is rent to pay and there are bills for light and heat. There are the wages of the errand boy too; but let us admit that, in the case of all the engravings plants, these items are the same, that is, of course, proportionate to the size of the plant; but there is one other item in the cost of the plate, and that is the point. The hand engraver, the finisher, is really the man who determines the value of the finished plate; and that is where the unscrupulous manufacturer has his conscientious brother at a disadvantage, for here it is that the customer gets his money's worth, or does not, as the case may be. I do not believe that there is any trade in the world where such really underhand and deceptive practices are employed to gain trade as in this one. There is a large order in the market. Mr. Photo-Engraver wishes to see the man who has the placing of it. "Let me only make you a sample plate. If it is not A1, you do not have to pay for it." The guileless editor falls into the trap with eyes wide open. The sample plate is finished, finished as it should be. Editor delighted. Price way under what any of the respectable houses could possibly touch it for. The whole order is placed, then comes the awakening. Half-finished plates—which for some unaccountable reason don't seem to print in the steam press just like the proofs which came with the cuts. If the customer had only held those "proofs" up to the light in the right direction, he might have seen some 'cute-like little pencil marks on them, but he didn't, his presses were waiting, and the engraver had delayed the work until the last possible moment. "Well, it's too late to have new cuts made now, so we will have to do the best we can, but photo-engravers are all cheats," &c. That's what the customer thinks, and with some justification, but why didn't he become suspicious when his photo-engraver offered to do the work two cents per square inch, face measurement, cheaper than Smith, who had always been doing the work before, and, besides, gave twelve proofs of each cut instead of two as Smith had been in the habit of giving—in fact, promises everything, and then keeps none of his promises, that is, no more than just keeping inside the law? Now, this photo-engraver had to pay rent, make negatives, polish his metal, buy his wood, and pay his errand boy, but he didn't finish his cuts as he should have; he deprived his conscientious fellow tradesman of his work, made no profit out of it himself, and damned the trade in general. But, in reality, it's the customer's fault, his desire for a "bargain" causes the whole trouble.—*Practical Process Worker.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

September	Name of Society.	Subject.
7	North Middlesex	Informal Meeting.
8	Hackney	Discussion on Exhibitions.
9	Photographic Club	Members' Open Night.
10	London and Provincial	*The Acetylene Light.* C. Hoddle.
12	Ashton-under-Lyne	Excursion: Warwick and Kenilworth. Leader, Dr. Hamilton.
12	Borough Polytechnic	Excursion: New Southgate and Hadley Woods.
12	Darwen	Excursion: Wilpshire to Ribchester. Leader, James Cavis.
12	Gospel Oak	Excursion: Whitchurch and Stanmore.
12	Leytonstone	Excursion: Woolwich. Leader, F. W. Wates.
12	South London	Excursion: Lambeth Palace. Leader, F. W. Edwards.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 27,—Mr. W. D. Welford in the chair.

Mr. ASHBY opened a discussion on the advantages and disadvantages of combined toning and fixing baths. His efforts with a particular formula had resulted in failure. He had first washed the prints.

The CHAIRMAN said it was not the rule to wash the prints first when using combined baths. He thought combined baths gave more uniform tones than separate baths.

Mr. BECKETT had never had a combined bath that would not tone. He considered them much quicker, of less trouble, and the whites were better. It generally took him from about fifteen to twenty minutes to tone a print in this way.

The CHAIRMAN referred to some instructions for use with a certain paper which recommended twenty minutes for fixing in the case of separate solutions, but with combined baths where it fixed first, if at the end of ten minutes the tone was what was required, it could be removed from the bath. How was it that fixation took shorter time in one case than another?

Mr. HADDON believed the ratio of hypo to water was different in the combined and the separate baths.

Mr. BANKS did not find combined baths work well with the modern printing-out papers, as they were too lightly silvered. In olden days the silver bath was much stronger, and he had a number of prints, done thirty years ago, quite good now. He had worked with hypo and alum, hypo and lead, and hypo and iron, and had got good tones, but they were not lasting.

A proposition was carried to organize a competition for the best four prints of London subjects taken within the postal district, the Judges (three in number) to be non-members.

PHOTOGRAPHIC CLUB.

AUGUST 26,—Mr. R. Child Bayley in the chair.

The HON. SECRETARY announced that the date of the annual outing to the Bull and Bush at Hampstead was fixed for Saturday, September 19.

Mr. Nesbit showed some hand-camera pictures made by himself, and others were shown which had been made by Mr. and Mrs. Welford in Cumberland.

Mr. Fry showed a slide and two developed plates to illustrate the fogging action which took place when plates were left in the slides for any length of time. The slide belonged to Mr. Hodd, and some discussion had taken place at a previous meeting as to the probable cause of the fogging action. There was a consensus of opinion amongst the members present that it was an unwise proceeding to leave unexposed plates in slides. Some instances were given, however, in which plates, allowed to remain in slides for nearly twelve months, had proved to be in sound condition. In the case of travellers, who were bound to leave their plates in the dark slides for uncertain periods, the safest course to pursue would be to test the slides for fogging qualities before trusting to them.

A discussion then took place upon the subject of

THE BEST BASIS FOR JUDGING AT PHOTOGRAPHIC EXHIBITIONS.

A member said that he thought the worst method was that which was now generally in force, viz., the collaboration of "artists" (painters) and "technical" photographers. The time had now passed when medals had a distinct commercial value, and he thought, with that value gone, the system of medal awards might go also.

Another member said that there always remained the difficulty of providing an incentive to exhibit. If there were no medals, why should photographers exhibit at all? He had found the medal system a distinct incentive, and all other systems were more or less failures.

A visitor said that he thought the public were the real judges. Let the visiting public vote for the pictures they preferred.

Other members pointed out that this method was open to grave frauds. An exhibitor might secure the attendance of a large number of friendly visitors, but a cynical member suggested that his friends might not vote as desired.

Another member pointed out that, even at exhibitions where no medals are awarded, yet a system obtains which amounts to an award, viz., the pictures have to pass a committee of selection.

The CHAIRMAN said he could hardly sum up the discussion, as but little had been said upon the actual subject itself, which was, "The *basis* upon which photographic exhibitions should be judged."

Hackney Photographic Society.—August 25, Mr. R. Beckett presiding.—Reports on excursion matters, &c., having been rendered, and other matters disposed of, representatives of the Cresco Fylma Company gave a demonstration of the various specialities of the firm. The principal of these was the Cresco Fylma uranium intensifier. Special advantages were claimed for this in that it did not clog, and the intensified image resisted twenty-four hours' washing without fading. The demonstrator showed that it offered great facilities for local intensification, and reduction also. It was also capable of producing fine brown tones on bromide paper and transparencies. Specimens of work done on Argura paper were shown. This is a gelatino-chloride emulsion on Whatman rough paper. Samples were distributed for trial. Examples of work done by the Cresco Fylma enlarging powder were also exhibited.

North Middlesex Photographic Society.—August 24, Mr. Pither in the chair.—Mr. C. M. Hamm was proposed as a member of the Society. Mr. C. BEADLE then proceeded with his lecture on

ENLARGED NEGATIVES BY MEANS OF CARBON TRANSPARENCIES.

He said that by this process it was possible to enlarge from either hard or soft negatives. A soft carbon transparency was required, and this could be got from a hard negative by taking advantage of the elasticity of the carbon process. He recommended for sensitising the tissue 4 ounces of bichromate to 2 quarts of water, and with addition of 80 or 90 minims of ammonia. For soft negatives a 1¼ per cent. solution of bichromate should be used. He also recommended, as a support for the transparency, pot or flashed opal glass, which gave very even lighting during the subsequent enlargement. For preparing the surface of the glass, 60 grains of gelatine to 4 ounces of water, and enough bichromate to give a pale lemon colour, or soaking in a solution of 3 or 4 grammes of chrome alum to the ounce after coating. He showed all the various processes, and developed several transparencies, and showed a home made enlarging apparatus in the shape of an oblong box, with which he made all his enlargements. He recommended as an easier way of focussing to place a well-marked line drawing in the place where the plate is situated, and focus this on a screen where the transparency would be placed. He preferred slow plates for making the enlarged negatives, as more latitude was obtainable. He passed round some fine specimens of enlarged negatives and prints in carbon.

AUGUST 31, Mr. Goodwin in the chair.—As this was an informal meeting, there was no set programme arranged, and members confined themselves to answering and discussing various points as they were raised. Mr. COX asked if any one had experienced fog resulting from reflection from the water in photographing a scene with water in the foreground. The light reflected therefrom was said to sometimes appear brighter than the sky, but, on testing it by means of examining the print through a hole in a piece of cardboard, it was found to be not really so. A lengthy discussion on pinhole photography then took place, and several members, including Messrs. Child Bayley, Golding, and Goodwin, promised to bring up prints in their possession at the next meeting. The Secretary showed prints of a negative in which a mark in the sky, which showed plainly in the print and negative before the latter was intensified, had quite disappeared after intensification had taken place. The Secretary then distributed tickets for the forthcoming lectures organized by the Affiliation of Photographic Societies' Committee.

Liverpool Amateur Photographic Association.—On Saturday, the 22nd ult., a number of the members of this Association, under the leadership of Mr. William Tomkinson, visited Woodchurch, Burton, Puddington, and Shotwick. This, being an excursion by waggonette, was an excellent opportunity for seeing this picturesque part of Cheshire at its best, the only drawback being the limited time allowed at each place; but, in face of all the difficulties, a considerable number of plates were submitted to the action of light, and the results are anxiously looked forward to. Messrs. Paul Lange, H. Lupton, H. Holt, J. Sirett Brown (the President), and many others were of the party.

FORTHCOMING EXHIBITIONS.

1896.	
Sept. 24-Nov. 7	Photographic Salon, Dudley Gallery, Piccadilly. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 28-Nov. 12 ...	Royal Photographic Society. R. Child Bayley, 12, Hanover-square.
Dec. 1896-Jan. 1897	Bristol International.

Patent News.

THE following applications for Patents were made between August 17 and August 22, 1896:—

PRINTING FRAMES.—No. 18,163. "An Improvement in Photographic Printing Frames." C. W. BAYLISS.

CAMERAS.—No. 18,228. "Improvements in Photographic Cameras." Complete specification. P. K. STERN.

LANTERNS.—No. 18,323. "Improvements in Projection Lanterns." W. I. CHADWICK.

CARRIERS.—No. 18,514. "An Improved Lantern-slide Holder or Carrier." J. H. FOWLER.

LANTERNS.—No. 18,579. "An Improved Optical Lantern." W. BUTCHER and W. F. BUTCHER.

PHOTOGRAPH FRAMES.—No. 18,595. "Improvements in Combination Photograph Frames and Stands for Jewellery and the like." R. MANDER.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

"THE POOR CHEMIST AGAIN."

To the EDITORS.

GENTLEMEN,—With the major portion of Mr. Hampson's letter, in a recent issue, I had little sympathy; at the same time your own paragraph, which I understand you reiterate, was calculated to raise the backs of some of the devoted adherents of the Pharmaceutical Society.

In that paragraph you stated that, "not long ago a firm of oilmen were prosecuted for selling a well-known brand of fly papers, and were fined 5*l.*; this proves that only pharmaceutical chemists can sell fly-papers." Now, of course, this reads like an atrocity. But the fact is you omit to state that the fly papers referred to contained *arsenic* in appreciable quantities; that as a matter of common knowledge, presuming that the varieties of fly papers number 144, *any one* can sell 143 of the number without restriction whatever! Then your "this proves, &c," is all wrong, because any person *on the register* can sell poisons regardless of the "pharmaceutical prefix."

Now Mr. Hewitt comes on the board with another grievance. To the

more intelligent photographer it is no doubt monstrously absurd that he should ask for carbonate of soda and get *bi*carbonate; but in the minds of the vast majority of customers it would be *criminal* to give washing soda when carbonate is asked for. To my mind the absurdity lies in the fact that a photographer should go to this particular chemist (who probably professes no special knowledge of photography) in preference to the two photo-chemists in the same town and within easy reach, to say nothing of the depôt of Mawson & Swan over the bridge! For the rest, I should like to hear the evidence of the pharmaceutical chemist referred to upon this question.

The business of a chemist is choke-full of anomalies, *e.g.*, people *will* ask for *carbonate* when they mean *bi*carbonate of soda or potash; for *liquorice* powder, when they mean a compound of sulphur, senna, fennel, and sugar, &c.; for hundreds of other things which if supplied *literally*, would grievously offend them.

Now friend "Cosmos" has a cut at us for occasional prescribing. Is it possible there is a man living, including "Cosmos" himself, who has not at some time or other applied to his chemist for a "draught or a bottle of stuff for a cold, cough, or touch of rheumatics?"

People are not so free of their guineas as to rush off to the doctor every time they get an ache or a pain. There is a decided preference—I can speak from practical experience in various parts of the country—amongst all ranks, from the peer downwards, to consult the chemist, at all events to commence with, and before laying out his gold; and why should he not? The work is simply thrust upon us, and we should be "thick heads" indeed, "to pass on" in all cases these anxious inquiries to the nearest medical man who will, probably, make up the medicine himself, and forget to thank you for sending him the patient! I *have* known such cases. No, gentlemen, all experience proves that "a bird in the hand is worth two in the bush." Besides, after all, what about the liberty of the subject to go where he will, and consult whom he will? which liberty I imagine "Cosmos" has very much at heart.

But I must have some consideration for your space.—I am, yours, &c.,

Nottingham. J. PIKE.

THE CITY AND GUILDS EXAMINATION.

To the EDITORS.

GENTLEMEN,—I read your Ex Cathedrâ notes of the JOURNAL to-day, and, in consequence, looked up the questions published on page 552. No. 1, Ordinary Grade, of those put at the examination, held last May, seems to me to be curious. I have been under the impression that *all* lenses had *both* visual and chemical foci, and that the "correcting" of a lens was the making these two foci coincident.

Would not the question have been better worded, and more intelligible, if it had run something like:—

"How would you ascertain whether the visual and chemical foci of a lens were, or were not, coincident?"—I am, yours, &c.,

Lower Colelate-road, Westward Ho! J. E. GUBBINS.

August 28, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Lord & Binns, Dalton-street, Todmorden.—*Photograph of A. G. Eastwood, Esq.*

Rev. John Dobson Riley, The Lawn, Shepton Mallet, Somerset.—*Five photographs of Shepton Mallet, Somerset, from different points of view.*

Michael Buckley, 117, George-street, Limerick.—*Group of Dean Whits and bishops of South of Ireland. Group of Dean White and bishops and priests of South of Ireland.*

John Stuart, 120, Buchanan-street, Glasgow.—*Photograph of His Excellency Li Hung Chang and suite arriving at Messrs. Neilson's works, Glasgow. Photograph of His Excellency Li Hung Chang and suite with Lord Provost and party at Messrs. Neilson's works, Glasgow.*

ALFRED FREKE; DRINKWATER BUTT; T. A. KAY; TURNER & DRINKWATER; H. W. L.—RECEIVED. Thanks. See under Ex Cathedrâ.

T. M. TURNBULL.—RECEIVED. Thanks. We shall probably make an extract from the letters in our next.

PHOTOGRAPHY AT THE CAPE.—OPERATOR. From what we have heard from one or two who have returned during the last year or so, we should scarcely advise you to go there with the view of getting employment in photography.

ELECTRIC RETOUCHER.—WOOD & CO. write: "Can you advise us where we may obtain the "Electric Retouching Pencil" as recently advertised? We are desirous of purchasing."—In reply: Harry's Electric Retoucher is (or was) advertised by Messrs. O. Sichel & Co., 52, Bunhill-row, E.C.

SCRATCHED LENS.—S. WILMOT. From your description the scratches on the back glass will make no practical difference in the working of the lens, but they make a difference in the market value of the instrument. If the lens is scratched, as stated, we should say that the sum asked for is quite enough.

LENS.—T. MCALPINE. It is impossible to give the slightest idea as to what the lens will cover, although you have given its diameter with great minuteness. The diameter of a lens is no criterion as to its covering powers. It is its focus, and the aperture it is worked with, that are the proper guides as to that.

BROMIDES FOR PLATINOTYPES.—M. R. E. Bromide prints, we fear, are often passed off as platinotypes. But it is a fraud, and comes within the false trade description law. Because others do it, that will be no justification, in the eye of the law, for your doing it if proceedings are taken against you. The fraud is easily detected by an expert, if not by the public.

STUDIO BUILDING.—E. S. J. Your neighbour may threaten as much as he likes, but he cannot prevent you from building the studio in the way you propose; but he can, as he says he will if he cannot stop the building, put up a high hoarding against his own wall, to stop out all your side light. Each of you can put up what you like on your own premises.

DOUBTFUL COPYRIGHT.—LANTERNIST. We cannot say for certain; but we have very little doubt that there is a good copyright in the photograph in question. A search at Stationers' Hall will not help you, as the work, being of German origin, if it is copyright in Germany, it would also, under the International Copyright Act, be copyright here, and would not be registered at Stationers' Hall.

SPOTS.—B. & CO. say: "We enclose a few bits of prints, with certain spots we cannot explain, which occasionally happen to our enlargements and prints. Could you kindly explain and greatly oblige?"—The spots appear to be due to small splashes of deleterious matter such as the developer, or maybe to particles of a reducing agent (iron or hydroquinone, for example) settling on the prints while they are wet.

DARK PRINTS.—R. HARDING. Several different methods have, from time to time, been described for reducing over-printed prints; but the method followed by professionals is to tear them up and make fresh ones. It is the best, and cheapest in the end, as reduced prints are never so good as properly printed ones, and, sometimes, not so permanent. It would not pay professionals to waste time in "vamping up" faulty prints.

EXPOSURE NOTE-BOOK WANTED.—R. SIMPSON writes: "I shall feel very much obliged if you could obtain for me *The Practical Index of Photographic Exposure*, by A. R. Wormald. Please reply by return of post the cost of it, which I will at once remit. Trusting you will be able to obtain it immediately, and let me know."—Our correspondent had better address Mr. Wormald, Sutton, Surrey, or some photographic dealer. We have not yet started business in the latter capacity.

STAINS.—W. L. NASH writes: "Will you be good enough to tell me what you think is the cause of the yellow discolouration over the middle of the horse in enclosed bromide enlargement? The print was fixed for half an hour in a hypo bath, four ounces to the pint. It was washed in running water for two hours and a half, and mounted with Higgins' mountant. I made two enlargements, this one and another. They were fixed in the same bath, using two pints of the solution, but they were washed in separate dishes. The other enlargement has no stain whatever."—The stain is due to the fixing. In all probability the prints were allowed to stick together when they were first put into the hyposulphite bath instead of being kept moving.

METOL FOR BROMIDE WORK.—ENLARGEMENT says: "I have for some time been using metol for bromide work, but find that, while possessing so many great advantages over iron that I do not wish to give it up with thin or flat negatives, it does not yield as brilliant prints as the latter developer, giving only grey tones, although with good negatives blacks are readily obtainable. I enclose my formula, and should be greatly obliged if you could suggest any modification or addition which shall at once give more contrast, not unfit it for ordinary negatives, and not impair its keeping qualities."—In reply: We have succeeded very well, under circumstances similar to yours, with a three-solution metol developer containing hydroquinone. See pp. 849-50 of the ALMANAC for 1896 for the formula.

PRINTING ON SILK.—T. G. SNOWDON says: "I am wishing to try a little printing on silk. I have used a formula I saw in the ALMANAC of a few years since. I cannot now remember it, and have not got the book at hand. It is the gelatine sizing bath previous to sensitising I remember least of. Would you mind repeating process, or at least give sizing bath, in the Answers to Correspondents in JOURNAL of Friday next. I have just used Iceland moss and chloride of ammonia, but it does not seem like the results I had before."—In reply: We cannot trace the formula you refer to. Possibly the following, due to Mallman & Scolik, will answer your purpose: 1. Tannin, 40 grammes; water, 100 c. c. 2. Common salt, 40 grammes; arrowroot, 40 grammes; acetic acid, 150 c. c.; water 1000 c. c. Gradually mix No. 1 with No. 2, shake and filter. Immerse the silk, dry and sensitise on a bath of 1 part of silver to 10 ounces of water, to which a drop or two of nitric acid has been added. If the method does not give the results you want, write us again.

*** Several Answers to Correspondents unavoidably left over.

THE BRITISH

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OUR FORTHCOMING ALMANAC.

The time of year has arrived when it is necessary for us to take in hand the preparation of The British Journal Photographic Almanac for 1897. A feature of the volume for the past thirty years has been the co-operation of numerous friends and readers of the Journal, and the Editor takes the opportunity to express the hope that the support so kindly placed at the disposal of his predecessors may be continued to him.

We especially invite contributions on topics of practical interest, and should feel obliged if the articles and any accompanying sketches are sent to us at the earliest possible date.

Secretaries of Societies, and especially of those established since the appearance of the last Almanac, will oblige us by forwarding lists of officers and other details for inclusion in the Directory of Photographic Societies, in order that the list may be made as complete as possible.

The Publishers wish us to remind intending advertisers that the announcement pages of the Almanac are already filling rapidly, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

We continue to receive correspondence from photographers who have been approached by the firm of diarists previously referred to, to allow their names to be placed in an almanac as willing to take photographs for nothing. Messrs. Turner & Drinkwater, of Hull, write us that "it is sincerely to be hoped that every photographer throughout the country will resent the offer in the way it fully deserves. The times may not be the happiest the profession has known, and the desire to obtain new business may be in some districts painfully keen, but it seems scarcely credible that any self-respecting man can be foolish enough to believe either his own individual interests or those of the community at large can be advanced by the methods proposed to him."

* * *

The answer sent by Messrs. Turner & Drinkwater in reply to the circular was as follows: "We are in receipt of your circular letter, offering to place our names on a list of photographers to whom your coupon-holders may be sent. Will you kindly inform us what is the intended remuneration from your firm to photographers who may honour the coupons in the way described?" This elicited the following response: "You do not seem to have grasped the idea contained in our letter *re* photographing. We do not propose to give any remuneration ourselves at all; but, inasmuch as probably eleven persons out of a dozen would not be satisfied with a single copy, but would order a quantity at full prices, the scheme should prove a most excellent one from the photographer's point of view; that, at all events, is the most general opinion of the photographic profession. If, however, it does not meet with your approval, we will make other arrangements for your district."

* * *

From what has already appeared in these columns on the subject it is highly probable that there are a considerable number of districts in which other arrangements may have to be made. As to its being the general opinion of the photographic profession that the scheme *should* prove a most excellent one, the authors of this circular are probably not wide of the mark; but, that the scheme is at all likely to *be* in any way profitable to the photographer, we take it that no disinterested person can for a moment think.

* * *

The Admiralty recently invited tenders for photographs of buildings, &c., in the Portsmouth district, and by the courtesy

of a friend we have been enabled to peruse the specification issued for the guidance of those photographers who might desire to submit tenders for the work. Some of the conditions imposed are rather stringent, and, unless we are much mistaken, are of a nature to deter many photographers from coveting the Government's patronage. The specification lays it down that the negatives are to be taken on gelatine emulsion plates, 12 × 10, freshly made and of best quality only, and possessing brilliancy of image with a good range of half-tone and free from pinholes and all other defects. Any negatives giving a thin flat image would be rejected. No fault could be found with this condition, we opine.

* * *

To a further condition that each negative must show perfect definition all over the plate, a falling off at the edges ensuring rejection, no objection could be taken, although we frequently find that even amongst expert photographers there is much diversity of opinion on the subject of what constitutes perfect photographic definition. The negatives, says the Admiralty specification, must be thoroughly fixed in at least two baths of freshly made hypo of the usual strength, and be then subjected to a continuous washing in running water for at least twelve hours. The second hypo bath certainly makes the assurance of complete fixation doubly sure, but it is not essential, and twelve hours is an excessively long washing to give gelatine negatives.

* * *

Platinum prints are specified for and they are to stand the mercuric chloride test. The Government are evidently up to the tricks of some unscrupulous photographers in supplying bromide prints for platinotypes. Prints of a hard or chalky appearance would be rejected, and when trimmed they are to measure $11\frac{3}{8} \times 9\frac{3}{8}$. A minimum number of six prints would be ordered, and the contractor must fix his apparatus in such a position as to embrace the angles of view as desired by the officer in charge of the works. On the whole, it appears to us that an exact compliance with the conditions laid down in the specifications would by no means remove the risk of a photographer having his negatives and prints rejected at the caprice of a Government official, who appears to suffer from an excess of knowledge. The order seems to be one for which not many photographers would be anxious to tender.

* * *

The Photographic Society of India's Ninth Annual International Exhibition of Photographs and Photographic Apparatus will be held in Calcutta during January and February, 1897. The Exhibition will be open to the world. Exhibits from Europe should be dispatched by the first week in November, or not later than November 15, and those from America a fortnight earlier. English exhibits may, if preferred, be sent through Mr. R. Child Bayley, 12, Hanover-square, London, and should reach him not later than November 1. Mr. Child Bayley will supply further particulars and entry forms.

FIXING AND WASHING PRINTS.

The subject of fixing and washing prints continues to exercise the minds of many of our readers, and probably there is no question in the whole range of photographic chemistry that better deserves the amount of attention that is given to it. In the matter of negatives even when treated with comparative carelessness, we never have the slightest doubt on the score of permanence; whereas with prints, whether on albumen or other surfaced paper, it still seems to be a moot question if absolute permanence can be claimed under any circumstances.

The recent researches of Messrs. Haddon and Grundy have thrown a good deal of light on points that have been hitherto somewhat obscure, and, while they indicate that the prolonged washings that were formerly resorted to after fixing are entirely unnecessary, if not absolutely injurious, they still suggest the suspicion that under no conditions can a silver print be considered free from the germs of ultimate decay. On the other hand, Mr. Edward Dunmore, who has had a lengthy and intimate practical acquaintance with silver printing on a large scale, points out in an article last week a fact that is very well known to many of our readers, that there are prints in existence that have shown no signs of deterioration during many, probably thirty or forty, years; and, as he suggests, there must be some rule, if we only knew it, by which such results could be attained with certainty. In pointing out, however, a number of the causes that operate to bring about want of permanence in practice, although he lays some stress upon the possible want of care when working on a large scale as being a prolific cause of fading and instability, he at the same time appears to recognise some purely chemical reasons why prints should fade in spite of the exercise of all care, or, at least, some causes which should operate to render their permanency doubtful.

We hold the opinion very strongly, as we endeavoured to show in an article a few weeks back, that with proper care and materials of ordinarily good quality, permanency, at least to the extent that we can fairly expect it in silver prints, should be an assured quality, and that any falling away from the regular standard of stability can be traced, or at least charged, to causes which, to put it plainly, are avoidable if only sufficient individual care were given to each print. In other words, that, while the process and the system may approach sufficiently near perfection for the purpose of ordinary permanency, the method of working on a practical scale falls short of what is necessary to secure the best results.

To recapitulate what we said but a short time back, and, indeed, to repeat what Mr. Dunmore says last week, theoretically, chloride of silver is perfectly soluble in hyposulphite of soda, and, if prints are properly fixed, there need be no difficulty in removing the products of the fixing operation. In fact, given perfect or sufficient fixation, there only remains the necessity for sufficient washing to remove the whole of the silver salt; and it is here, we think, where the method of working fails. It is true that in Messrs. Haddon and Grundy's experiments they have found that it is impossible to remove the very last traces of silver from prints, however long they may be washed. But then the question may be raised whether this is the result of imperfect fixation or imperfect washing; whether it is due to the formation of some silver compound in the prints that the fixing solution is incapable of removing, or to decomposition during the process of washing of some of the originally soluble products of the fixing process.

To illustrate what we mean, we may cite an experiment that will very clearly show how a slight variation in the method of working will altogether alter the character of the result. Let an ordinary gelatine plate be fixed in a bath of clean, fresh hypo; and, in order to eliminate any chance of stains from outside causes, let the plate be an unexposed and undeveloped one. In fact, let the solution that clings to the plate, when

removed from the fixing bath, be one of pure bromide of silver in clean and uncoloured hypo. Without washing the plate, allow some of the solution clinging to it drop on to clean white blotting-paper, or, better still, linen, upon which it will leave no immediate stain. Let one portion of the blotting-paper or linen be at once subjected to thorough washing in ordinary water, after the manner of a print, and let the other be put on one side for twenty-four hours, and then washed with equal care and both dried. At this stage, probably neither will show any signs of discolouration; but, if they be put away in the dark, in course of time a very distinct yellow stain will be developed on that portion that was not immediately washed.

The experiment may be extended by allowing a third portion of paper or linen to remain unwashed for, say, twenty-four hours, and then, either with or without previous washing, immerse it in clean hypo for a short time, and finally wash well. In this case also, despite the interval allowed to elapse before washing, no stain will appear in course of time, showing that, until the decomposition has taken a visible form, it is preventible, if not by simple washing, at least by a repetition of the fixing process.

A somewhat analogous result is obtained, as any worker with gelatine plates is aware, by neglecting to wash a negative on its removal from the fixing bath. If two negatives be placed side by side in the same dish until fixed, and one be then removed and placed to drain without washing, it will be found, in the course of half an hour, or perhaps less, to have acquired a strong yellow colouration, while the other plate, although allowed to remain all the time, and even for a very much longer period, in the solution, will retain its original colourless character. The inference from which is clearly that, although the fixing of a print or of a negative may be efficiently performed, and the perfectly soluble double salt produced, the latter is very liable to rapid decomposition, *except in the presence of an excess of the fixing agent.*

Perhaps this forms the true explanation of many examples of fading or discolouration that are supposed to arise from quite different causes. For instance, it has been stated that exposure to light before the negative or print has been sufficiently washed will cause discolouration; but, from experiments frequently repeated with solutions of pure chloride or bromide of silver in hypo, exposure to light has never produced any effect, though exposure to the atmosphere may. In fact, it may be noticed that almost instantly a print is immersed in the fixing bath it loses its sensitiveness to ordinary daylight.

Then, again, it is supposed by many that one of the causes of the gradual fading of silver prints, at least upon albumen paper, is the formation of a silver compound that the fixing solution is incapable of dissolving; but this does not seem to be a reasonable explanation if we make the experiment of precipitating albumenate of silver, and, after thoroughly washing it, treating it with hypo. It will be found to be perfectly and completely soluble, and, so far as we remember from experiments made in this direction, the solution so formed is not liable to reprecipitate the silver salt on dilution.

We conclude by repeating our impression that, with fair and proper treatment, there is no reason why silver prints should not be practically permanent; where this is not the case, it is the fault of the method rather than of the chemical process.

Millais' Work.—The panels in the Judges' lodgings at Leeds, it appears, were painted by the late President of the Royal Academy when he was only a lad of eighteen. The work is not signed by the artist, but there seems to be no question as to its authenticity. The panels, we hear, are now to be removed to the Corporation Art Gallery. The Corporation, doubtless, think the late artist's work will be better located in its Art Gallery than in the Judges' lodgings. The Leeds Art Gallery contains some fine works, as most of the late Conventioners know.

Li Hung Chang in America.—Li seems to have been more liberal in America than he is credited with having been while here. It is said that before leaving New York he had a bouquet presented to every lady staying at the hotel. The Manager had a present of some tea and a photograph. All the clerks in the hotel also were presented with Li's photograph, while the waiters received more substantial presents. Evidently the Celestial was on good terms with himself, as seen in his photographs, for he seems to have been particularly liberal in their distribution wherever he went.

An Extremely Delicate Test for Iodine.—A small quantity of acetaldehyde (say, twenty drops) is left for an hour in an otherwise empty flask of large size—about a quart—and is then made into an emulsion, with ten times as much water. The solution suspected of containing an iodide is then treated by the addition of a very small quantity of the new reagent, which has the property of liberating iodine (but not bromine or chlorine) from solutions of their salts. An extremely small quantity of colourless bisulphide of carbon is next shaken up with the liquid under examination, when, if no more than one part in fifty thousand be present, it can be perceived by the pink colour it will impart to the bisulphide.

Novel Use of the X Rays.—The latest use to which the Röntgen rays have been put, or the latest we are aware of, is for advertising purposes. In an enterprising bootmaker's window, not a hundred miles from Ludgate-circus, are shown a couple of sciographs. One is of a foot showing a distortion of the bones, caused by wearing an ill-fitting shoe; the other is of the sole of a boot, showing the bent pins and brads, &c., it contained. Of course there was an intimation that the boots were not made at that establishment. The advertisement seemed to fulfil its object, as the sciographs appeared to attract the attention of passers-by. What is the next use that will be made of Röntgen's discovery? one may naturally ask.

Chemical Inactivity of the Röntgen Rays.—In view of the familiar effect of light rays on a photographic plate, which can only be brought about by some initial decomposition or chemical action on the silver in the film, it is surprising to learn from a paper by Messrs. H. B. Dixon and H. Brereton Baker, read at the last meeting of the Chemical Society, that a negative result was obtained in every case they investigated, in endeavouring to discover if the rays were able to influence chemical change, either by starting it or by accelerating or diminishing it, after it has been started by ordinary light. They tried carbon monoxide and hydrogen (dried and moist), hydrogen and oxygen, hydrogen and chlorine, carbon monoxide and chlorine, hydrogen sulphide and sulphur dioxide, solutions of sodium sulphite and oxygen, slow oxidation of phosphorus, decomposition of hydrogen peroxide. The result was the same in each case.

Röntgen Rays with a Wimshurst Machine.—Though much was said in the early stages of the X-ray fever about the usefulness of this machine, most observers appear to have settled down to batteries or dynamos as a source of electricity; but a writer in the *English Mechanic* describes the work done by Mr. H. C. Ogden, of Middletown, New York, with a home-made machine of the Wimshurst pattern which will set experimenters thinking. We refer readers to the communication itself* for full details; it will suffice for us to state that Mr. Ogden is represented as having (the machine

* *English Mechanic*, vol. lxiv. p. 61.

being home-made and only twenty inches in diameter) obtained an impression by the Röntgen rays (using a Crookes' tube of course) in the one-thousandth part of a second. Indeed, he obtained a representation of one object by eight sparks which he estimates as being of the total duration of the one-three-thousandth of a second.

The British Museum.—It is well known that the subject of the separation of the national collection of books from the British Museum has been discussed for several years past, though it has as yet come to nothing. Something, it seems, will have to be done in the near future, for both departments are rapidly outgrowing their resources. The Museum is acquiring so many fresh treasures that they cannot be efficiently displayed, while the library, on the other hand, is already so overcrowded, that thousands of books are at present practically inaccessible to the public. Most of our readers who have occasion to consult the library on works photographic are fully aware of the time it often takes to obtain what is required. Not only is this the case with the works in question, but with books in general, if they happen to be somewhat old. With more space at command, this would, no doubt, be obviated, to the great convenience of those who have, at times, to refer to the books.

A New Art Work by Mr. W. J. Stillman.—It is announced that Mr. W. J. Stillman is now engaged on editing a large work entitled *Venus and Apollo, in Painting and Sculpture*, which will contain over eighty large-sized photogravures of works by celebrated old masters and sculptors. The work will be published late in the autumn. The price of the work we do not know, but, as it contains so many photogravures of large size, it necessarily will be somewhat costly. Many of our older readers will be pleased to hear that Mr. Stillman "is in the land of the living," though his name seldom now appears in connexion with photography. This is due rather to his long residence abroad than anything else, for he is still an enthusiast in photography. A quarter of a century ago he invented a portable camera, "Stillman's camera," which was at that time an improvement in many features on what had gone before. Mr. Stillman's photographic work was always identified with its artistic as well as its technical excellence, even in the wet-plate days.

The Royal Arms—a Caution.—Reference has more than once been made in these columns to the use of the Royal Arms by photographers who are not privileged to do so. In the "legal notices" in some of the daily papers, last week, is an advertisement of the solicitors for the Incorporated Association of her Majesty's Warrant-holders, Limited, dated August 31. It gives notice that proceedings will be taken against all persons who display the Royal Arms, or a near copy thereof, on the exterior of their premises, their bill heads, stationery, or otherwise, except they hold a warrant to do so, unless they forthwith discontinue such illegal use. The advertisement quotes from the Statute 46 and 47, cap. 57, sec. 106, "Any person who without the authority of her Majesty, or any of the Royal family, or of any Government department, assumes or uses in connexion with any trade, business, calling, or profession, the Royal Arms, or arms so nearly resembling the same as to be calculated to deceive, shall be liable on summary conviction to a fine not exceeding 20*l*." We call special attention to this advertisement, because we know that some use the Royal Arms thinking that they are entitled to do so through having supplied photographs to the Queen or some members of the Royal family. This is not the case; the warrant to do so must be obtained.

Enamelled Iron Trays.—Of late years a most marked improvement has taken place in the manufacture of iron, or, it may be, steel, trays covered with enamel. Time was when such vessels were utterly useless for photographic and many other purposes, as the coating used to break and chip or shell off without any apparent cause. The later productions of the kind, however, are so differently made that they have become most valuable adjuncts to the dark room or printing room. For platinum hot-bath printing it would be difficult to find an efficient substitute, as they can be heated over a naked gas flame, and the liquid raised to boiling point without danger. The enamel keeps its colour, and is apparently unacted upon by chemicals. It would, however, appear that there is danger of the introduction of a new type of enamel which is readily acted upon by chemicals, and which, under some conditions, might be detrimental to photographic processes in which it was utilised. It will, of course, be understood that we are referring to actual enamel, that is, a substance of the nature of glass fused to the surface of the metal, and not the so-called enamel composed only of a coating of some species of varnish, well stoved to give hardness. The usual enamels contain generally silica, boric acid, alumina, and alkalies, and for white enamel, such as is used in photographic dishes, stannic oxide. The most recent kind to which we draw attention is composed of sodium and potassium, combined with silica, lead, arsenic, and a trace of cobalt, the stannic oxide of the older kind being replaced by arsenate. It is found that this enamel is attacked by dilute acids, and should thus be excluded from photographic use, not to speak of the dangerous character it would possess for any culinary purpose, which scarcely concerns us, though the domestic "pie-dish" and the like play an important part in many an amateur's outfit.

Other Dishes to be Rejected.—It is often suggested that dishes of aluminium should be used to replace ebonite and *papier-mâché;* but a recently published paper by Herr Christian Göttig gives an excellent idea of the value or otherwise of this metal for this purpose. He finds among other things that, providing it is sufficiently dilute, ammonia dissolves aluminium with comparative readiness, hydrogen gas being given off even when there is only ·025 of ammonia present; that is to say, about a grain of ammonia in eight ounces of water, a quantity far less than would be found in a very weak developing solution. It is thus evident that the life of such a dish could not be expected to be long, and there would be the added factor to be considered in pyro-ammonia development, of the hydrogen gas evolved. True, this might be looked upon as a further addition to the reducing power of the solution, but its use would be, at present at any rate, purely empirical. Further, so long as ammonia is present, its action on the tray would still continue though it were in the form of a salt; in fact, an acid solution of ammonia has a still stronger action on the metal, though in this instance no gas is evolved.

FOREIGN NEWS AND NOTES.

The Spectrum of Argon.—Eder and Valenta have just presented to the Imperial Academy of Sciences in Vienna an important monograph upon the spectrum of argon, which is illustrated by some very fine photogravures. They have photographed and measured the wave-length—about two thousand lines in the argon spectrum—with an error not exceeding one-hundredth to one-thousandth of a ten-millionth of a millimetre. Although it was known that argon had a red and a blue spectrum, these two scientists have discovered a third or white spectrum, and also that some of the lines show a displacement towards the red end of the spectrum which will probably cause a change, or at least a more stringent examination into Doppler's law, which is so much used in astr-ophysical researches, and from which the motion of some of the stars has been calculated, for they have proved that change of wave-length may occur, although the source of light is stationary. The authors finally come to the conclusion that argon is a mixture of at least two elements.

Damp *versus* Dry Gelatine Plates.—Helheim points out, in the *Photographisches Archiv*, that, if part of a plate is wetted, and then the whole exposed in the camera, the wet portion will, on development, show but the merest trace of an image, whilst the dry part will be well developed. This has very frequently been ascribed to an actual lowering of the sensitiveness, but Helheim states that this is hardly the case, as, if a plate, half of which has been damped, is exposed and then allowed to dry, there is no difference to be seen,

and that probably the so-called loss of sensitiveness is due to the fact that, when the film is wet, it merely has a different resistant action to the various constituents of the developer.

Sensitiveness and Temperature.—According to the researches of Dr. Precht and Schellen, the light-sensitiveness of gelatino-bromide of silver is not affected by variation in temperature between −20° and +90° C., as on development they gave the same density of precipitated silver. Meyer and Acworth have shown that the photo-chemical decomposition of silver chloride is diminished by heat; and Abney's experiments before the Camera Club, which were preceded by Joly's, proved that there was a lowering of sensitiveness with the drop in temperature.

Some New Photographs of the Pleiades.—The well-known astronomer Stratonow has been successful in obtaining some very successful negatives of the Pleiades. One was obtained with an exposure of nearly ten hours on three successive nights; another received twenty-five hours' exposure on nine nights, and a third seventeen and a half hours' on nine nights. A twelve-inch refractor was used, and on the second negative no less than 6614 stars have been counted on four square degrees. Several nebulæ of distinctly new form have been also photographed on the plates.

Reticulation of Carbon Tissue.—Rapp points out that the reticulation of carbon tissue which is so often met with in summer is generally due to too rapid drying of the tissue and unequal contraction or expansion between the gelatine and its support, and that this is more noticeable when a stiff support, such as glass, is used. The remedy for this is to use a substratum of chrome alum gelatine, made by adding a six per cent. solution of chrome alum to a five per cent. solution of gelatine till it becomes quite thick and coagulated, and then adding glacial acetic acid to make it fluid. It may also be avoided by coating the tissue before transferring with thin enamel collodion; but this is more suitable for a flexible temporary or final support.

The Colour of Chloride Transparencies.—Goderus & Dupont have published in the *Bulletin Belge* some experiments upon the variation of tones to be obtained on chloride plates, and they have come to the conclusion that the colour is in no way dependent upon the duration of exposure, but rather on the amount of bromide in the developer and the duration of development. Goderus recommends a ferrous-oxalate developer composed of thirty per cent. solution of sodium oxalate 60 parts, thirty per cent. solution of ferrous sulphate 5 parts, and ten per cent. solution of potassium bromide 200 parts. The image is first yellow, but, as development proceeds, runs the whole gamut of colours to a violet-black. Dupont, on the other hand, uses a six per cent. solution of sodium sulphite to which 0·5 per cent. of amidol is added, and the plates are bathed in a ten per cent. solution of ammonium bromide, and upon the length of their stay in this bath depends the colour. If they are bathed for ten seconds, a sort of green moonlight tone is obtained; with twenty-five seconds, a grass-green; with thirty to forty seconds, a greenish-yellow, whilst with sixty seconds a good transparent black is obtained. The plate should be laid in the amidol solution without washing off the bromide.

To Reduce Harsh Contrasts.—The old method of improving negatives with hard contrasts by coating them with bichromated gelatine, and exposing till the shadows have acted thoroughly and before the high lights have had time to act, has been again revived by a writer in the *Deutsche Photographen Zeitung*, who further suggests the tinting of the insoluble chromated gelatine after thoroughly washing the various dyes. This method is extremely useful in certain cases, but presents no features of novelty, and is somewhat inferior in results to bleaching the images, redeveloping and refixing before the high lights are developed through.

Yellowed Platinotypes.—In the current number of the *Photographische Mittheilungen* Pouleuc Frères suggest the use of a five per cent. solution of sodium hypochlorite for bleaching yellowed platinotypes, the prints being immersed in successive baths of this till they become quite white, and after careful washing the prints should be rinsed in the ordinary hypochloric acid bath to destroy the last traces of hypochlorite.

Coloured Photographs.—The *Actiengesellschaft für Anilinfabrication*, in Berlin, have patented a process for the production of coloured prints, in which use is made of the diazo compounds of certain aniline dyes, which is somewhat similar to the diazotype process of Messrs. Green, Cross, & Bevan, and Feertype invented by Dr. Feer. The diazo compounds are spread on paper, dried, exposed, and then developed, the various colours being obtained by the use of different solutions.

PHOTOGRAPHIC WORKERS AT WORK.

XI.—The Brighton Photographic Company at Brighton.

A flying visit to the "Queen of Watering-places" enables us to reach the premises of the Brighton Photographic Company just at the time when the *employés* have left work for the day, and thus we have an excellent opportunity of passing freely through the different rooms, and noting the various installations the Company possess in order to fit them to conduct the many branches of their business. It might at the first offset occur to the reader that an enlarging company, established on the southern coast, would only enjoy a greater or less degree of local patronage, and he would, doubtless, be just as much surprised as we were to learn, from visible evidence, that the Brighton Photographic Company execute work for photographers from all over the kingdom, and that, in its nature and extent, the firm well ranks with the large printing and enlarging works that are to be found in the suburbs of London.

The works, situated in Clarence-square, are contained in a three-storied building, isolated on all sides and commanding a good light—no mean advantage when it is considered that much of the Company's enlarging work is done by daylight. The offices and printing rooms are in another building close by; and the packing and mounting rooms in the main building. A brief gossip with Mr. Wicks, sen., whose photographic reminiscences extend back to the Daguerreotype era, prefaces our delivery into the hands of Mr. Wicks, jun., in whose company we ascend to the first floor and find ourselves in the room devoted to the production of enlarged negatives, &c., by the wet-plate process. Here the system employed is of the simplest. The sensitising solution for the collodionised plate is contained in a large bath swung on trunnions, and the bath being partly revolved a steady and even flow of solution is given to the plate which, when the bath is again inclined to the normal angle, rests on a ledge just free of the solution. One of these baths is for plates, 48×36, and requires ten gallons of silver solution. Reflected daylight during all but the winter months is utilised for projecting the image on to the wet plate, focussing being done on ground glass by moving the frame, which runs in a tramway—a system adopted in several rooms throughout the works. The exposures vary between four and fifteen minutes. We may note, in passing, that for reproduction purposes dry plates, after many trials, do not yet seem likely to oust wet collodion at the Brighton works.

Our attention is next directed to a large reducing camera, which occupies a small room adjacent to the one we have just referred to. This piece of apparatus we should think well pays for itself. It is about ten feet long, and is mounted on a light wooden frame running on four feet to which castors are attached, and it is thus easily moved from one part of the room to another. A simple screw adjustment actuating the lens board allows of the objective being centered, or moved in any part of the frame horizontally or vertically, while a movable back allows of two or three successive and accurately registered exposures being made on one plate or of two lantern slides also being so made. A simple clamp adjustment to the frame, moreover, admits of the correction of an erratic water or sky line in the original negative, and these and other minor conveniences in the camera make us envious of a very handy piece of apparatus. Reductions can be made by this camera direct from 15×12 to lantern size.

In the rooms devoted to bromide work we note one or two useful practical ideas which tend to great comfort in working. For example, the developing lamps, glazed with non-actinic glass, are swung over the developing sinks, thus taking the light from the eyes of the operators

and concentrating it on to the prints or enlargements—a pleasant and common-sense arrangement. Ferrous oxalate is still used for development. (It is surprising to note what little headway the other developers have made, for bromide work, with professional photographers and enlargers.) We learn that very prolonged soaking or washing is not in favour for the fixed prints. The system adopted is to have two large slate tanks, with constantly changing water. The prints, being placed to soak in one, are taken separately, subjected to a thorough squeegeeing, and again soaked in fresh water. Half a dozen squeegeeings and soakings complete this part of the process, a final washing of two hours being then given, and Mr. Wicks assured us that the system had not yet come under suspicion as to lack of permanency of results.

The contact prints on bromide paper are made by a simple yet very ingenious plan, which saves much time and is highly effective. Electric light being available, an incandescent lamp is placed inside a square wooden box-like structure having a sheet of glass let in its top. On this the negative is placed. A large cardboard mask, with several pencilled lines as guides is next placed *in situ*, and the exposure is made by pressing the bromide paper into contact with the negative by means of a flat presser held in the left hand, the large sheet of bromide paper being moved at each exposure which is made by actuating a switch that controls the light. The latter is, of course, instantly turned on or off. With dense negatives an exposure of ten seconds is necessary, three seconds sufficing for thinner *clichés*.

Albumen paper is still used at the Brighton works, where it is sensitised on the premises; platinum and gelatino-chloride are also availed of to a considerable extent. A very large number of carbon enlargements are produced—the tissue being floated at the works—and the beautiful quality of the results that we were shown testifies both to the careful manner in which the process is worked throughout, as well as to its popularity with photographers and the public. The carbon method is also utilised for the production of cloud negatives, very many of which, on celluloid, are sent out from Brighton. Except in dark months of the year, when electricity is available, daylight is used for the enlargements that are made. A branch of the establishment which we had to miss, and which is situated in another part of the town, is devoted to colouring and finishing.

What struck us at the Brighton Photographic Company's establishment was the thoroughly workmanlike nature of the apparatus used in the various processes, and the cleanliness and orderliness everywhere visible. This being so, there exists little room for surprise that, in the many negatives, prints, enlargements, and transparencies we were shown, a very great degree of technical skill was manifested, and that the finished results sent out touch a high level of beauty and merit. Our short account hardly does justice to the admirable way in which the business is conducted.

THE POSITION OF PHARMACY.

The recent references in our columns to the Pharmaceutical Society and its methods of administering the provisions of the Poisons Act doubtless confer great interest to many of our readers, on the two following letters that lately appeared in a Glasgow contemporary.

"To the Editor of the *Glasgow Herald*.

"Sir,—In recent years numerous prosecutions under the Pharmacy Act have called public attention in a special manner to the drug business. It is to be regretted, however, that those precautions have only diverted attention from the real difficulties with which pharmacy has to contend. Whilst the people are judging harshly of the Pharmaceutical Society in prosecuting various individuals who have transgressed against the Pharmacy Act, they are quite unaware of the far more serious difficulties with which pharmacy has to contend, and against which the Pharmacy Act appears to hurl itself in vain.

"Regarding the exact nature and scope of the Pharmacy Act much ignorance exists, not only amongst the people generally, but amongst those who are charged with the administration of it, and, in Scotland more particularly, adverse remarks made from the Bench have influenced public opinion beyond calculation. Indeed, remarks have been made at times which were calculated to diffuse the opinion that chemists are sordid, selfish, and grasping in business matters, and that they wish to wring a system of protection out of the Pharmacy Act which it was never meant to extend.

"To speak of the Pharmaceutical Society as a sort of chartered company which desires to create a monopoly in drugs is unjust in the highest degree. It has, no doubt, been reserved for the Society to take the initiative in instituting proceedings against those guilty of infringement of the Pharmacy Act; but the Act itself was framed, not in the interests of chemists, but in the interests of the general public. The same Act which provides for the public safety, by demanding that poisons shall only be sold by those acquainted with the nature and character of poisonous drugs, demands, upon the other hand, that the possession of this acquaintance shall be demonstrated upon the part of the seller by proof produced of having passed examinations of an educational nature, the scope of which is approved of by the Privy Council. It would be a gross injustice to demand special qualifications in the interests of the public from any body of men, and, at the same time, refuse protection as a counterbalance, and of such injustice the framers of the Pharmacy Act never meant to be guilty. No Act could be plainer in its language than the Pharmacy Act is, and the injustice under which chemists suffer at the present time is in no way chargeable upon the Act itself, but upon those who have persistently misadministered it. In the first clause of the Pharmacy Act the following words occur:—

"'It shall be unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding poisons, or to assume or use the title "chemist and druggist," or "chemist," or "druggist," or "pharmacist," or "dispensing chemist," or "druggist," in any part of Great Britain, unless such person shall be a pharmaceutical chemist, or a chemist and druggist within the meaning of this Act,' &c.

"The meaning of this clause is perfectly plain. Every letter of it spells protection, and the whole Act from beginning to end recognises that special qualification cannot be enforced without protection. It has been decided, however, that as 'person' does not mean 'persons,' a limited company may trade in drugs, even if there are no qualified shareholders in it at all. The full significance of this finding has never become apparent to the general public, and we would hope, in the interests of justice, that it did not become apparent to those charged with the administration of the Act at the time. Private individuals who knew nothing about drugs formed companies, the entire shares in which were held within one family circle. Drug stores were in this way started all over the country by individuals in defiance of the Pharmacy Act, and greatly to the derogation of pharmacy, both from a scientific and professional point of view. Of course, it would have been better if the Act had said 'person or persons,' but there can be no mistake about the real meaning of the language in which it is actually couched. Chemists have in this matter so far had few enough friends upon their side, but I am glad to see that the London *Times* has recently come down with a strong article upon the subject. He quotes the case of a young man who served his time to the drug business and went in for the preliminary examination of the Pharmaceutical Society fifteen times without being able to pass. During that time he had frequently been prosecuted for keeping open shop, being unqualified, but at last he formed himself into a company and so escaped from all his difficulties. Of course, this was a bad case, but it was not, in my opinion, so glaringly absurd as the cases of numerous others who have formed themselves into companies, knowing nothing about the drug business at all.

"Not the least injustice of all this consists in the fact that the chemist who has been carefully trained to regard pharmacy as a responsible science, and who is therefore, by reason of this very training, possessed more of professional instinct than business instincts, is brought into competition with the roaring salesman, for whom he is no fit match. Indeed, the professional instincts are cultivated directly at the expense of the business instincts, so that the chemist cannot fairly compete with the man who looks upon drugs as mere articles of commerce, to be pushed, and roared, and placarded about the town. Things which the mere salesman can do without compunction are looked down upon by the professional man, with his keener instincts for what is in accord with the position he holds and the responsibilities he is under to support the dignity of his profession.

"An even worse feature, however, consists in this, that pharmacy is by this whole system pulled down and kept down, so that Great Britain is falling behind in the world of scientific pharmacy. In place of pharmacy being made a useful institution based upon true scientific principles, and making true scientific progress, it is degraded practically to a huge market, in which quack medicines and proprietary articles of all kinds are roared, and pushed, and crammed upon the public, regardless altogether of what diseases they can cure, if any, regardless also of the sufferings of humanity, so long as sales are made.

"In Germany and France the chemist is left to pursue his calling peacefully, and as a result almost all scientific advances in pharmacy have been made in these countries. In Great Britain the chemist has either to come to his shop door, so to speak, and roar more loudly than his unqualified opponent, or else see his family go into the workhouse. Not long ago a chemist in France took into partnership a man who was unqualified because he had cash, but the law came down and dissolved the partnership, at the same time imposing a heavy fine upon the unqualified man. If he had been in Great Britain, he might have opened twenty shops without any qualified partner at all, and our Judges would have said he was a public benefactor.

"Another heavy evil consists in this, that not only are the masters unqualified, but they employ numerous unqualified assistants, many of whom have not even learned the drug business. One qualified man is engaged at perhaps a salary of 90*l.*, and ten others are unqualified. The business does 50*l.* a day, and this man has to cover his master and ten

unqualified assistants for 90*l*. a year. Truly a certificate from the Pharmaceutical Society has to go a long way. By this means ten men who have qualified at great expense and trouble are thrown upon the streets, or compelled to take what salary they can get for second-rate situations, such as managing doctors' shops, &c., for it must always be borne in mind that the drug business is a limited business, and cannot give employment to many people.

"Indeed, this fact plays a very important part in the whole matter. The drug business is so limited that it cannot be divided between qualified and unqualified men. The demand for groceries, for instance, is practically unlimited, but not so with drugs. The legitimate drug business is very much more limited than people think, and large cutting places as a rule only exist by putting up all sorts of proprietary medicines of the quack order and selling them to an all-too-credulous public. The actual consumpt of pure drugs and chemists' sundries is at the very outside calculation not over 10*s*. per head of the population per annum. I dare say, the consumpt of groceries will be about 10*l*., but upon that subject I am not so well qualified to speak.

"Now, in these days of democracy, we have all got it into our heads that Britain is a free country and will not tolerate any form of Protection, and somehow or other this question has got swamped in the bogs of political controversy. Chemists have, in my opinion, accepted this position too readily. They have practically acknowledged that it is a matter of Free Trade *versus* Protection. I say it is nothing of the kind; the whole question is outside that of Free Trade altogether. It is entirely a matter of special protection demanded from a Government which has demanded special qualification. I am surprised that chemists don't insist more upon this point. I am surprised even that men of education who are not chemists fail to see the justice of it. I was speaking recently to a clergyman upon the subject, and I met with the usual remark—"Yes, but they keep a qualified man, don't they?" How would this clergyman, or any other clergyman, like it if some farmer or other were to step in and claim his living, at the same time giving him 90*l*. a year for doing the work? If the clergyman were to complain, I would say, "Yes, but the farmer keeps a qualified man, does he not?" And yet Government demands no special qualification from the clergyman, and doesn't care what he preaches or how he does his work. If there is a case of suicide from poison, or a case of accidental poisoning, it is odds but that the chemist at whose shop the poison was bought has his business permanently ruined, even if he was in no way to blame, by Government inquiry and officialdom, but after the man is dead, whether the clergyman did his work well or not—well, there is no Government inquiry.

"I think that the quickest way to cure all this would be for chemists to approach the Privy Council with a view to obtaining the same power to purge the register that doctors and lawyers already have. We could, in this manner, cut off the names of qualified men who covered unqualified, and then nobody would be able to say, "Yes; but he keeps a qualified man, does he not?" This right is exercised frequently by both the Medical Council and the Society of Advocates, and chemists will never make a fair living or be at liberty to devote time and attention to the higher and more scientific side of pharmacy until they obtain the same right. In the mean time I would say to parents and guardians, Don't send your lads to the drug business. It means hard work, long hours, arduous study, grave responsibility, and 90*l*. a year for lifting all these off the shoulders of a man who probably never made a manly effort in his life to stand in a manly position.—I am, yours, &c., R."

"Sir,—In your issue of Saturday a correspondent signing himself 'R.' pleads for a more stringent Pharmacy Act and for more extensive powers to the Pharmaceutical Society. He says the public are judging harshly and ignorantly regarding recent prosecutions by the Pharmaceutical Society; that the Pharmacy Act 'has been persistently maladministered;' and that the Judges on the bench have made adverse and unwarrantable remarks on the prosecutions.

"The Judges, no doubt, have their limitations. They are obliged to construe Acts of Parliament as they find them printed by the Queen's printers, and they are not entitled to assume intentions of the Legislature which are not expressed in words. Your correspondent may have the advantage of the Judges in knowing better what were the intentions of the framers of the Pharmacy Act. The Judges have assumed, perhaps erroneously, that the intention of the Legislature, in passing the Sale of Poisons Act, was the protection of the public against the careless and ignorant handling of poisons which were to be used as medicines. They have accordingly held that, where a properly qualified person is engaged in a drug store to dispense poisons, the requirements of the Pharmacy Act are fully met.

"In consequence of this judgment, drug stores, as your correspondent says, 'have been started all over the country by individuals who knew nothing about drugs,' but who formed companies and engaged qualified persons. This, your correspondent says, 'has been done in defiance of the Pharmacy Act, and greatly to the derogation of pharmacy both from a scientific and professional point of view.' What is meant by 'the derogation of pharmacy from the scientific and professional point of view' I take to be simply this, that medicines have, since the establishment of those drug stores, been sold at very much less prices than formerly. This is all that is meant by 'the derogation of pharmacy,' and by 'pharmacy being pulled down and kept down, and falling behind in the world of pharmacy.' People are paying less than they did for their medicines, and this is the serious state of affairs for which the people are implored to find a remedy.

"'Not the least injustice,' says 'R.,' is that 'the chemist, with his professional instincts, is brought into competition with the roaring salesman, for whom he is no fit match.' Who the 'roaring salesman' may be I am not quite sure, but I have some notion what the 'professional instincts' are which are 'cultivated at the expense of the business instincts,' and which place the man who is possessed of more professional instinct than business instinct at a disadvantage when brought into competition with others. If the 'professional instinct' is that insufferable conceit that leads men engaged in some professions to regard themselves as very much better than their neighbours, one can understand how men impregnated with this 'professional instinct' will be at a disadvantage when brought into competition with men having that business instinct which leads them to be serviceable to their neighbours. I suppose it will be 'professional instinct' which leads your correspondent to speak of the 'roaring salesman' and the 'mere salesman,' and to say of him that he can do without compunction things that the professional chemist looks down on. The chemist, according to 'R.,' has 'a keener instinct for what is in accord with the position he holds and the responsibilities he is under to support the dignity of his profession'—which simply means that the chemist has a very high opinion of himself. This high opinion is maintained greatly through ignorance of others. It is not at all likely that the general knowledge of the chemist is greater than that of printers, or booksellers, or watchmakers, or photographers, or masons, or joiners, or painters. Each of those tradesmen knows his own business, and some of them in general knowledge would surpass the chemist. The chemist is not always an Admirable Crichton; he is sometimes a person of very limited culture, of whom the best that could be hoped is that he should know his own business.

"Your correspondent thinks that a great evil arises from qualified chemists 'covering' unqualified men. But the Pharmacy Act does not sanction any 'covering.' It says it shall not be lawful for any person to retail, or dispense, or compound poisons except a qualified chemist. That means that a qualified person only has to dispense the poisons, whether it be in a shop or a store. It does not permit a qualified chemist to delegate his duties to, say, a boy of fifteen, while he is away for a week or two. Yet this is often done, and I suggest that the Pharmaceutical Society should see to it. The persons who are most frequently violating the Pharmacy Act are the chemists themselves.

"Your correspondent says that the people are judging harshly of the Pharmaceutical Society regarding recent prosecutions. I think that exceedingly likely, and I think the harsh judgment is very fully justified. There was no public interest served by the prosecution of dealers in photographic materials, even though these materials were poisonous. There was in these prosecutions a very obvious attempt to create a monopoly in favour of chemists, to the disadvantage of the public. There was a straining of the Pharmacy Act to purposes which were certainly not in public contemplation when the Act was passed. It was certainly not anticipated that the Pharmacy Act, which gave to druggists who had experience in compounding doctors' prescriptions, and to others who might acquire like knowledge, a sole privilege of compounding and selling poisonous medicines—it was not anticipated, I say, that the Act was to prevent seedsmen from selling plant dressings, or drysalters from selling such stuffs as are needed in manufacturing operations. The Pharmaceutical Society has shown, by the recent prosecutions, that the words of the Act are capable of being construed so as to needlessly harass traders all over the country. It may, no doubt, appear to the chemist very desirable to confer upon him an extensive monopoly, but it will not appear equally desirable to the general public. W. D. Macgregor."

FLASHLIGHT PHOTOGRAPHY.

[Australian Photographic Journal.]

It has been a matter of surprise to me that, while flashlight work has received considerable attention in England and other parts of the world, both from professionals and amateurs, this fascinating branch of the art seems to be almost entirely neglected throughout the Australian colonies.

There is no reason whatever why this should be so, unless it be that amateurs and others have "tried their 'prentice hands" at it and failed, or have been deterred from taking it up from an erroneous impression that it is a most difficult and expensive pastime, with far greater chances of failure than of success.

My object in these articles is to dispel any such idea, and to give such detailed and *practical* information on the subject as will enable any one with a very limited experience in photography to command success in ninety cases in every hundred.

But, first, a word as to the utility of flashlight work. I have been asked this question on several occasions, and have wondered that any intelligent person should fail to see its usefulness. One is enabled by its means to obtain photographs of places and scenes utterly impossible in any other way. Daylight is dispensed with, and is substituted by one

more actinic in its character, and far more thoroughly under the control of the operator. Portraits may be taken at night, pretty and effective family groups and gatherings secured amid all those every-day surroundings which make the word "home" so dear. What more delightful and welcome present could be received by absent members than a photograph of "those at home" by the old fireside, in the "dear old room" where the happy days of youth and childhood were spent in the long, long years ago?

If for no other reason, flashlight photography should take a leading place, and be valued highly by all interested in the art; but when, added to this, one can also secure permanent records of visits to the caves and caverns of the earth, work in the mines, and last, but not least, of the various acts and scenes in amateur and other theatrical performances—to say nothing of fancy-dress balls and the like—I think little need be said further in its favour. That it is possible, and comparatively easy, to do such things, I hope to show.

The Apparatus.

Without further remarks, I will go into the matter, beginning with the apparatus.

This, as already mentioned, need not be of an expensive character, or deter any amateur with even very limited means. Of course, should he be a millionaire, he may be as extravagant as he pleases; but, although he may thus make the work somewhat easier, I will not guarantee his pictures will be improved thereby. One of the Ilford gold-medal pictures, and the negative of which that Company made a request to purchase, was taken by means of a battery of "five penny clay tobacco pipes." The secret of success was the arrangement of the lamps and figures in the picture, and which the reader may easily repeat by following the directions given:—

For an ordinary room up to 24 × 14 feet (the size of room in above picture), procure four round sticks—straight broomsticks will do well—about 40 inches long and ⅞ inch thick. Get the smith to fit a brass or stout tin ferrule 7 inches long at the end of stick No. 1, in which to place No. 2. Cut two pieces of dry and *heavy* timber, each 20 × 2½ × 2 inches. Mortise these so that they will be across each other even with the floor, in such a manner that the centre of the crossing portion is about 14 inches from the long ends. Make these to fit tightly into each other, but so that they may be knocked apart for packing purposes. A thumb-screw, going *nearly* through, will secure them when in use. Bore a hole just large enough to fit end of stick No. 1, almost—but not quite—through the centre of the cross, and put a screw-eye into each end of both pieces. Erect Nos. 1 and 2 into the hole, and, to thoroughly steady them, put a small screw-eye through ferrule into No. 1, and secure all together with stays of strong cord. Get the smith to make two *strong* T-shaped ferrules, so that the top portions fit on No. 2 so tightly that, while they may be moved up and down with an effort, they will not move of themselves. *This is important.* The other part of each ferrule must fit one end of sticks Nos. 3 and 4, which may, with advantage, be somewhat thinner than the other two. Place ferrules on No. 2, so that upper cross arm will be 6 inches from top, and the other one about 1 foot below this; insert ends of the other two sticks, twist them at right angles, or more, to each other, and the support for the lamps is complete.

Should any reader have a difficulty in making this apparatus for himself, no doubt it can be supplied by photographic stock dealers, with packing box complete, at moderate cost.

I will suppose five lamps are to be fitted, although, should a less number be sufficient for the purpose, the others may be cut off by drawing the rubber tubing from them and fitting the ends with small corks to prevent the escape of air when discharging the lamps. Whether "tobacco pipes" or the more highly finished and ornamental "flash-lamps" are used, the arrangement will be the same. First mark position of *three* lamps on *upper* arm, in the middle and near each end, but clear of the ferrule. On the lower arm the best places are near the outer end and about 15 inches from upright. If pipes are used, they must be secured to the arms by means of rubber bands or fine binding wire, not too rigidly, but so that the tubing may be easily slipped on and off, yet firmly enough to prevent them "turning turtle." Should lamps be used, perhaps the easiest way to secure them is to have two stout wire spikes, soldered on each, about 1¼ inches long, and on either side. Holes to match bored through the arms will receive and hold them securely. These lamps must all be connected by small rubber tubing, similar to that used for discharging pneumatic shutters. In this manner make or obtain the following brass connecting tubes, of such thickness as to allow rubber to be tightly stretched thereon. Their several arms need not be more than 1 inch in length. One T piece, two Y shape, one F. Secure these also loosely to the frame as follows:— ⊢ to side of ferrule, holding the lower arm; one Y on this arm between ferrule and first lamp; F to side of upper ferrule; and the other Y between first and second lamps on upper arm. Connect all these and lamps together with the rubber tubing, leaving some 15 feet hanging from the lower ferrule with which to discharge the lamps. The air supply may be produced by a *large* pneumatic ball, the lungs, or a pair of bellows. In the latter case a spiral spring must be fastened between the two handles to keep the bellows inflated and prevent them collapsing and so firing off the charges before their time. They are easily acted upon by the foot when all is ready. Personally, I prefer "my own bellows" (lungs), and accordingly have the 15-feet length of the larger gas tubing, the lower limit of its ferrule being made of stouter brass to fit it tightly. In order to prevent any chance of this being dragged off the ferrule, it is well to tie a piece of string tightly round rubber, a few inches below ferrule, on stick No. 1, and loop it over the screw-eye in the same.

Charles Gruncell.

(To be continued.)

THE SPECTRUM SENSITIVENESS OF A SILVER SALT.

[Journal of the Royal Photographic Society.]

The question which it is desired to discuss is, Why a sensitive salt is sensitive to more than merely monochromatic light? We have to come back to first principles before we can endeavour to answer the question at all. The principle, or perhaps we may call it the law, involved in the first place is that, where there is absorption of light by a body, there work of some kind must be performed. When we place a slab of bromide of silver in front of the slit of the spectroscope, or, what will do as well, if we examine a spectrum through such a slab, we find that the light that it absorbs corresponds with the photographic action that takes place on a bromide plate. Of course, this may be taken as a reply to the question, if we wish; but it is my wish to carry the matter a stage further back. It may be taken as axiomatic that, when light acts on bromide of silver Ag_2Br_2, one atom of bromine is thrown out of the molecule by the light itself, and the only way in which this can be done is by the waves of light increasing the swing of the atom as it vibrates in the molecule. It is usually considered that we must have well-timed blows to increase a swing of a body, that is, that they must be perpetually given at a fixed interval of time, such time being the time of the swing. But in the case of the atom of bromine which is swung out we have an almost infinite number of waves of different periods which will affect it. Thus, from the yellow to ultra-violet, we have a whole octave of waves which affect the bromide of silver. It looks as if that what is usually accepted as a necessity is not so. The explanation, however, is not far to seek. It can only require a certain amplitude (the amplitude which is sufficient depending on circumstances external to the molecule, such as the avidity of a neighbouring substance to attract the atom and to annex it) to cause it to swing beyond the sphere of molecular attraction, and, if this is attained, any further increase in motion is superfluous as far as that atom is concerned.

The next point to consider is, whether such an increase in motion or swing can be given by waves which are not absolutely in tune with the swing. A very simple physical experiment shows that such can be the case. Swing two pendulums side by side on the same knife edge; let one be a cord with a small weight attached, and the other a heavy weight with a rigid attachment. Let them, first of all, be of the same length. When the heavy weight is set in motion, the flexible pendulum will take up the motion and swing with it side by side, and as long as one swings the other will swing. Let, however, the flexible pendulum be slightly shorter than the rigid pendulum, and the motion of the former will be increased at first, and then, after a long interval, die away, and again increase, and so on, this increase and diminution depending on the relative lengths of the two pendulums. When the swing of one is in the opposite direction to the swing of the other, the swing of the light pendulum will gradually diminish until it comes to rest, when it will commence to swing again with the heavy pendulum. Supposing the flexible pendulum to be an atom acted upon by a wave motion with which it is not absolutely in tune, it will increase the amplitude of swing at first, and, if the amplitude it takes is sufficient to take it out of the sphere of the attraction of the molecule, it will not matter that the two motions are not exactly of the same period. We eventually come to periods of vibration which are so different that the atom can never be ejected, and here we have no sensitiveness, as it is called. Absorption indicates the same thing in a visible manner, so absorption and sensitiveness go hand in hand. It seems to me that, broadly, this is a view that accounts for atomic motion answering to such a large part of the spectrum, as we know it does. This view may be enlarged in various directions to account for phenomena which I have called attention to in the last three years or so. The increase in sensitiveness in a higher temperature of the silver salt, the sluggishness of the response to feeble light, and also to very intense light, can be traced to this cause, and I propose shortly to give a theory based on what has just been indicated.

Captain Abney, C.B., D.C.L., F.R.S., P.R.P.S.

ON THE RÖNTGEN RAYS.

[Extract from the President's Annual Address to the Victoria Institute.]

For a very long time it has been known that an electric discharge passes more readily through tolerably rarefied air than through air of greater density, and so with other gases. If we have a longish closed tube, provided with electrodes at the ends by means of platinum wires passing through the glass, if the air be tolerably exhausted from it, an electric discharge passes, comparatively speaking, freely through it, forming a beautiful skein of light, if I may so speak, and under certain circumstances that skein of light is divided into strata in a very remarkable manner. These strata fill the greater part of the tube from the positive electrode, or anode, as it is called, till we get nearly, but not quite, to the negative electrode, or cathode. There is a dark space separating the end of the positive discharge which, as I said, under suitable conditions and sufficiently high exhaustion, shows stratification from a blue glow enveloping the negative electrode or part of it. The luminosity about the cathode is somewhat indefinitely bounded on the side of the stratification.

When, however, the exhaustion is carried still further, at the same time the strata become wider apart, and the luminosity recedes from the cathode and expands, forming a sort of glowing halo much more sharply defined on the inside than the outside; in that respect resembling the ordinary luminous halo—not the corona—occasionally seen round the moon. We have here, then, these two dark spaces; one outside the halo, where the luminosity gradually fades off, and another dark space on the inside, where the luminosity is more sharply defined, and which reaches to the negative electrode.

Now, it is the phenomena in connexion with this second dark space that I have more particularly to bring before you. As the exhaustion is rendered higher and higher, the inner dark space gets wider and wider, until at a sufficiently high exhaustion it fills the whole tube or bulb. Mr. Crookes has worked more especially at this subject, and, indeed, the tubes which are now used for the production of the Röntgen rays are generally called "Crookes' tubes." I have seen in some of the foreign periodicals the word "Crookes" used to signify one of these tubes. Mr. Crookes' researches in very high vacua led him up to that most remarkable instrument, the radiometer, the nature of which led us to form clearer conceptions than we had hitherto done, of the nature of the motion of molecules in gas; or, rather, when the theory of the radiometer was made out, presented us, as I may say, with a visible exhibition of the thing in actual working.

Now, these researches, which led Mr. Crookes to improve his vacuum, naturally led him to examine the electrical phenomena produced by excessively high vacua.

I have said that it was with the second or inner dark space that I had chiefly to do. When the exhaustion is sufficient, that fills the whole tube.

Now, what takes place in this dark space? Suppose we interpose a screen, such as a plate of mica with a hole in it. A portion of the discharge from the negative electrode goes through that hole and continues onwards in a straight course until it reaches the wall of the tube. When it reaches the wall of the tube (I will suppose the tube, as it is called, to be made of German glass) it produces a greenish yellow fluorescence, or phosphorescence of very brief duration. I need hardly say that, if you do not limit what comes from the negative electrode by the screen with a hole in it, you get a broader beam, which affects the glass wall over a larger space.

Now, what is it that proceeds from the negative electrode towards the glass, and, when it gets there, produces this phosphorescence? Is it light, or is it matter?

One remarkable circumstance connected with this *something* is, that you can deflect it in its course by a magnet. If you present a magnet to a ray of light, it does not deflect it at all; but this *something* is easily deflected by a magnet, even by a tolerably weak magnet. Mr. Crookes found that in addition to that property, if this discharge of a something fell upon one side of a very light fan formed of thin, split mica, and delicately mounted so as to enable it to spin readily, it sent it spinning round; and he believed that the nature of that which we have here to do with is, that it is a stream of molecules. Nobody, I suppose, denies that there is matter propelled; but there has been a considerable difference of opinion as to whether the matter propelled is of the essence of the phenomenon, or whether it is something merely accidental. Mr. Crookes held that it was of the essence of the phenomenon, and that we had here, really, a stream of molecules, and I must say, for my own part, I believe he was right. But some foreign men of science hold that the projection of matter is altogether a secondary phenomenon, and that what comes through this small hole is really only a process which goes on in the ether—something so far of the nature of light, but yet differing from ordinary light most markedly in the property of being deflected by a magnet. To illustrate what I mean by saying something secondary, Professor Wiedemann, who holds the opinion that it is of the nature of light, or a process going on in the ether, imagines that the projection of matter has no more to do with the phenomenon than the path of a cannon ball has to do with your hearing the sound of the cannon. I think, myself, that it has a great deal more to do with it than that. However, I will leave that matter for the present to pass on to some researches which led up to the remarkable discovery by Dr. Röntgen.

In Germany, Professor Lenard made a very remarkable series of experiments in what the Germans call, and what we may call, the cathodic rays, and which he believed to be actual rays, and not streams of molecules sent from the cathode. In order to produce these rays, as I will call them, you want a very high vacuum. If, however, you make your vacuum too high and too nearly perfect, you cannot get the electric discharge to pass through it. A perfect vacuum appears to be a non-conductor, and, if you attempted to make the electric discharge pass through it, it would go, by preference, on the outside from one electrode to the other, so that you cannot work directly with anything too nearly approaching to a perfect vacuum. But it is a very remarkable thing, though Lenard, I believe, was not the first to discover it, but Hittorff, that these cathodic rays pass, or appear to pass, through a plate of aluminium which is perfectly impervious to light, or even to the ultra-violet rays, which we know by their effects, though we do not see them directly; so that you may have these cathodic rays at one side and something of the same kind at the other. Lenard constructed an apparatus commencing with a Crookes' tube, in which there was very high, though not too high, exhaustion, with a cathode which was either flat or cup-shaped at one end, and opposite to that, in the part where the cathodic rays would strike the glass if it were there, instead of glass it was closed by a thin plate of aluminium foil, so thin that it would support the atmospheric pressure although it was impervious to air. But as a continuation of that tube he had another tube, which was also capable of exhaustion. The two tubes had glass tubes leading from them to the same air pump. There was communication with the air pump and communication between the two tubes, and you could exhaust them together, and the pressure would be so far reduced that the aluminium plate was strong enough to sustain the reduced pressure. They were both exhausted together until a suitable exhaustion was produced for the production of the cathodic rays in the first tube, and then the connexion between the two tubes was intercepted, and the exhaustion of the second tube, which was kept connected with the air pump, was continued for several days, until, as near as he could get it, there was nothing at all in the way of gas left in it. What was the result? In the first tube the cathodic rays were produced by the electric discharge. They fell on the aluminium foil at the end, and then there was a continuation of cathodic rays in the highly exhausted tube—the vacuum tube I will call it—and these went on as if they had been rays of light. They were deflected by the magnet just like the original cathodic rays.

Now, at first sight, that looks very much as if you had to deal with actual rays, which passed through the aluminium foil, just as rays of light would pass through a plate of glass. But I think the real explanation of it is altogether different. I believe it to be of this nature. First, I will use rather a gross illustration, in order that you may the better apprehend the nature of the other explanation that I am about to bring before you. Suppose that I have a row of ivory balls in contact, such as billiard balls, and that another similar ball strikes the first of these. The result is that the last of the balls is sent off, and the striking ball and the intermediate balls remain approximately at rest. Now it is conceivable that something analogous to that may take place as regards these so-called cathodic rays, supposing they are not rays at all, but streams of molecules. It is conceivable that the molecules proceeding from the cathode or negative electrode of the first tube, be they of residual gas, or aluminium, or platinum, might fall upon the thin aluminium plate which forms a wall between the two tubes, separating the one from the other, and that that would give rise to molecular discharge in the second space, although the actual moving molecules never passed through the wall. As I say, that is a rough illustration—rather a gross and material illustration—to enable you to understand more clearly the view I have to bring before you.

I have said that the so-called cathodic rays are easily deflected by a magnet. Now, we know from other experiments that if a body sufficiently charged with electricity is in rapid motion, and that motion takes place in a magnetic field, the body tends to be deflected. This looks, therefore, very much as if these cathodic rays are actually streams of molecules, which, being highly charged electrically, and of almost inconceivable minuteness, would be deflected by a slight magnetic force. Now, if these highly charged molecules come to strike on the aluminium wall which separates the two tubes (which are end to end) from one another, it may be that an electrical action goes on which resembles very much what electrolysis is supposed to be according to the views of Grotthus. I shall not have time to enter into an explanation of that now, for it would lead me too far from the subject; but several present will, no doubt, understand what I mean when I refer to the views of Grotthus. The molecules then impinge on the wall, and give rise to a projection of molecules from the second side of the wall, but the latter are not the same molecules which impinged on the first side of it. Whether the molecules projected in the second tube come from a very minute quantity of residual gas, or whether they are derived from the aluminium wall itself, from which they are torn, as it were, does not signify for my purpose. We have here, you see, a conceivable mode of emitting these so-called rays in this way, simulating the transmission of a ray of light through a plate of glass, though it is no ray at all that we are dealing with. I confess I think that that is the true view of the action which

akes place; but Lenard himself believed that the cathodic rays were, as he said, processes in the ether. By means of the first tube used alone, as was done in the first instance, but closed with a "window" of somewhat thicker aluminium foil, so as to sustain the atmospheric pressure, he was able to receive the cathodic rays which came from the second surface of the aluminium foil in air, where he could examine them at pleasure, using for their detection sometimes a phosphorescent or fluorescent screen, sometimes a photographic plate. He found that, under these conditions, they were quickly deflected from their original direction and dispersed, so that they could not be traced far, just like rays of light in a turbid medium, such as water to which a little milk has been added, whereas in a subsequent series of experiments, to which reference has already been made, in which the cathodic rays were received into a second tube, the dispersion became less and less as the exhaustion proceeded, until, at the highest attainable approach to a perfect vacuum, the dispersion almost disappeared, and the rays were traced right onwards for a metre and more, and that without being enlarged by diffraction, as would be the case with rays of light.

Lenard mentioned incidentally that these cathodic rays, as he supposed they were, were able to pass through the hand even. He missed the discovery of the X rays because he had, I may say, the cathodic rays too much in his head, and attributed the whole effect on either side of the wall to the cathodic rays. Really the effect is due in part to the cathodic rays, and in part to the Röntgen rays, the existence of which he was not aware of. They cannot be distinguished merely by their effect on a fluorescent screen or on a photographic plate, since both these recipients are affected by the rays of both kinds.

Such was the state of things when Röntgen made his remarkable discovery. According to an account which I saw in one of the newspapers (we cannot vouch for the truth of everything we see in the newspapers), the discovery was made in the first instance accidentally. I cannot give you more authentic information than that, but he had been working with a Crookes' tube, and he observed that a photographic plate, enclosed in the usual case in which these plates are enclosed when you want to protect them from light, showed, on development, certain markings on it; so he put the whole apparatus, as it had been, with a photographic plate in its case in the same position as before, and the thing was repeated. This is according to the account in the newspapers. A very remarkable discovery was the result. He found that rays were capable of coming out of some parts of a Crookes' tube which had the remarkable property of passing through substances that are opaque to ordinary light, and opaque even to the ultra-violet with which we were previously acquainted. They pass freely through black paper, through cork, wood, or even through the flesh of the hand, though less freely through the bones, so that, by simply laying his hand upon the case containing the photographic plate, he actually got a photograph of the bones of his hand.

Well, what is the nature of these rays, and whence do they come? As Röntgen said in his original paper, a slight examination shows that they have their origin in the part of the Crookes' tube opposite to the cathode, and which is rendered phosphorescent by the discharge from the cathode.

The rays, however, which come from this part of the tube, and which appear to have their origin there, differ utterly in some respects from the so-called cathodic rays. If you isolate a portion of them, you find that a magnet has no action upon them; unlike the cathodic rays, they proceed onwards without deflection, just as if the magnet were not there. Like light, they proceed in a straight course, but these rays are able to pass through a variety of substances that are opaque to ordinary light, while, on the other hand, they are stopped by other substances which let light freely through. That, however, does not prove that they are not of the nature of light. You may have, suppose, a red glass which is opaque to green rays, but let red rays through very freely, so that as regards merely the fact of the X rays being stopped by substances transparent to light, while they pass more or less freely through other substances which are quite opaque to ordinary light, that establishes no greater distinction than exists between green and red light. Are they, then, of the same nature as light?

The X rays have some very remarkable properties, by which they appear at first sight to differ *in toto* from ordinary light. They pass with either no refraction, or excessively small refraction, through prism-shaped bodies, which we know rays of light do not. They suffer hardly any, if any, regular reflection, unless perhaps at a grazing incidence.

Röntgen himself, in his original paper, dwelt on these peculiarities of the new rays. He formed a prism of aluminium, with which he attempted to obtain deviation of the new rays, but the experiment showed that, if there were any deviation at all, at any rate the refractive index could not exceed 1·05. He speaks of the rays not being apparently capable of regular reflection, but he brought forward experiments which show that, in a certain sense, they appear to be capable of reflection.

A photographic plate with the sensitive surface downwards was placed in its case under a Crookes' tube, and immediately under the plate, and inside the case, were placed portions of different kinds of metal which would be capable of reflecting back the rays on to the sensitive surface if they admitted of reflection; and it was found that the plate was much more darkened over certain of those metals than where the metals did not exist. There was very little darkening over aluminium, and a great deal of darkening comparatively over platinum. This indicated that some effect was produced, though the greater part of it is not one of regular reflection. He conceived the effect to be one of reflection such as you might have from a turbid medium.

There is, however, another mode of explanation, which seems worth considering, viz., that the Röntgen rays, falling upon the metal, throw the molecules into a state of vibration, which they communicate to the ether by a sort of phosphorescence or fluorescence of X light, so that the rays which come from the molecules, though perhaps not of exactly the same nature as the X rays that fell upon them, still have enough of the "X" quality about them, whatever that is, to enable them to get through objects which are opaque to ordinary light.

Lord Blythswood, who has worked a great deal with the Röntgen rays, has written a paper, which was communicated to the Royal Society by Lord Kelvin, in which he establishes a minute regular reflection of those rays from speculum metal at an angle of about 45°. Two plain specula were placed side by side so as to receive at that angle the X rays coming from a Crookes' tube, and a duly protected photographic plate was placed in such a position as to receive the regularly reflected rays, if there should be any. The developed plate appeared to show a slight indication of the junction between the mirrors, and that the appearance was not illusory was shown by Lord Kelvin, who made measurements on the image, and compared the results with what they ought to be on the supposition of a regular reflection. The indication was so faint that I could not myself perceive it (I have not seen the negative, but only positive copies), but Lord Blythswood has given me some positive copies of a negative which he subsequently obtained by reflection from a concave speculum at a small angle of incidence, and which show for certain a minute regular reflection of X rays, while, at the same time, they prove that the quantity of X light returned by regular reflection is extremely small compared with that which comes from the mirror by some different process.

SIR G. G. STOKES, F.R.S.

(*To be continued.*)

LABORATORY USE OF ACETYLENE.

Now that acetylene has come so much in prominence, an instance of its use in a laboratory, which possesses no gas supply, may be an encouragement to any one similarly situated. Long doomed to the use of spirit lamps, "benzoline roarers," and the like, says Mr. A. E. Mundy in *Nature*, the cheap production of acetylene has come as a great boon to us, and is now in regular use for blowpipe work. The apparatus in use consists of an aspirator holding about fifteen litres, permanently connected with a water supply, and possessing a ¼-inch aperture exit tap (the water flows in from below to minimise absorption); at the top a three-hole rubber cork carries an upright pipe passing through the table, which serves for filling the aspirator with gas, or using the gas on the table, a second pipe goes to the blowpipe, and a third carries an open mercury manometer. For filling the jar, the calcium carbide is placed in a four-ounce bottle, closed by a cork carrying a small separating funnel from which the water drops; the gas passes to the aspirator through a wide glass tube, which acts as a reversed condenser, returning most of the water vapour to the bottle. With the large exit to the aspirator the gas can always be collected under a reduced pressure of several cm. of mercury, which quite provides against any sudden rushes of gas; the operation takes some ten minutes, and requires practically no attention.

In using the gas, the water is turned on with all taps closed for a few seconds, to correct any reduced pressure caused by absorption, as shown by the gauge (this is very slight indeed), and then the gas tap fully opened, and the flame regulated entirely by the water entrance. To bring the gas into use takes hardly any longer than with an ordinary gas blowpipe. A good fusion on platinum foil (*e.g.*, $BaSO_4+N_2CO_3$) may be affected by using about one litre of the gas. We have used the apparatus for about two months, and I recently discovered that some of my junior workers did not know what acetylene smelt like, which speaks well for it, if not for them. I am hoping to introduce the gas on to the benches, if the difficulty of the enormous quantity of air required to produce a non-luminous flame can be overcome.

The Inquirer.

*** *In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

FINISHING BROMIDE ENLARGEMENTS.—J. E. Brown inquires: "1. What are the best colours for finishing bromide enlargements developed with iron? 2. The address of Zuccato & Wolff, Typograph makers, London."

IMITATION OPALS.—W. Beaton writes: "I cannot, in our town, readily obtain opal glass, and when I can it is not fit for photo-

graphic use. I have heard of substitutes, in the form of a gelatine emulsion of barium sulphate or some such substance, but I cannot succeed in getting a perfect film. I have tried making an emulsion with Epsom salts and nitrate of barium in gelatine, but the result is as coarse as sand paper. Can you help me with a formula or any advice as to how to proceed?"

RETOUCHING MEDIUM.—In reply to "Portraitist" I should like to point out one cause of retouching media not giving a good tooth. It is frequently recommended to apply the medium with the finger tip. I find it much better to apply by means of a bit of clean rag smoothly folded over the finger tip, thus preventing the greasy moisture from one's hand mixing with the medium. The slight moisture mentioned is quite sufficient to repel either graphite or water colour. I shall be pleased to send "Portraitist" a sample of a really reliable medium, on receipt of his address, with postage.—RETOUCHER.

RETOUCHING MEDIUM.—If "Portraitist," who asks for a retouching medium, will forward me his address, I will send him a bottle of a kind I use myself and find quite reliable. I cannot help thinking his difficulties arise from leaving too much medium on the negative. It should be spread with the tip of the finger, working in a circular direction until it is nearly dry, and finished by stroking with the finger in straight lines *until it is quite dry*. All retouching should be done upon the film, and protected with varnish. If necessary, more work can be put on the top of the varnish, but this should always be avoided if possible, and the medium put only on the part to be retouched, as it always has a tendency to attach dust, &c., to the surface of negative. My own negatives are first coated with celluloid varnish thinned with acetone and spirit (methylated). After retouching, the negative is varnished a second time with a good shellac varnish. It can then be left out in the rain without fear of injury.—HAROLD BAKER.

DOUBLE FIXING OF PRINTS.—IN DOUBT says: "I have seen it recommended to employ two separate fixing baths, both for negatives and prints, in order to ensure their perfect fixation. The sulphocyanides have also been put forward for fixing prints, but are stated not to effectually do the work when used alone, although they are supposed to tend less to fading than hypo. This being the case, how would it answer to use a hypo bath first, and follow this, after rinsing the prints in water, with one of sulphocyanide? Would not the latter probably remove the ill effects of the hypo?"—We cannot see any advantage over two hypo baths, while there are several reasons that can be urged against the sulphocyanide, the chief of which is that a solution sufficiently strong to be of any use in fixing, especially negatives, would soften or dissolve the gelatine and ruin either negative or print.

INSENSITIVE COLLODION EMULSION.—N. B. B. writes: "I had intended to point out, when writing on this subject recently, that it is often said that a bromide emulsion film that has been treated with a wash of weak iodide of potassium is perfectly insensitive to light. This is far from being the case unless the soaking is very prolonged and a considerable quantity of solution used. The insensitiveness depends upon the total conversion of the silver bromide into iodide, the latter salt when formed in the presence of excess of soluble iodide being, it is well known, insensitive to light under ordinary conditions. But a weak solution of iodide of potassium—by which I mean a solution of five or six grains to the ounce—will take a very long time to completely convert the whole of the bromide, and consequently, more especially if well washed afterwards, such a film will be very subject to fog if exposed to light. The only plan is to use a fairly strong solution, though not sufficiently strong to dissolve out the silver iodide when formed."

Our Editorial Table.

SAMPLES OF CHRISTMAS CARDS.

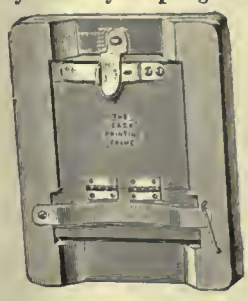
Wilfred Emery, 3, Soho-street, W.

A FEW samples of Christmas cards, with photographs mounted on them, reach us from Mr. Emery, who is supplying dealers and stationers. The cards are neat and tasteful. Mr. Emery undertakes to make up customers' negatives as Christmas cards for publication or otherwise. His prices appear to be very moderate.

THE "EASY" PRINTING FRAME.

William Tylar, High-street, Aston, Birmingham.

BY rotating the small clip shown at one end of the cut, a portion of the back of this frame, amounting to about two-thirds, is released, thus allowing the photographer to examine nearly the whole of the print, which is securely held by a spring clamp at the other end



of the frame. Hence there is no risk of movement. The frame embodies a useful idea, and should be welcome to both professional and amateur printers.

A VISIT TO THE CARLTON HILL CAMERA WORKS.

By R. W. STARR. Leeds: J. Heughton.

THE Carlton Hill Camera Works of Messrs. Watkinson & Co. form the subject of a brief, but clearly written, description from the pen of Mr. R. W. Starr, who pleasantly guides the reader through the workshops and other premises of the enterprising firm, whom many visitors to the Leeds Convention will, doubtless, keep in remembrance. By way of illustrations, twelve capital collotypes are given from which a good bird's-eye view is obtained of the works. The booklet is an effective reminder of Messrs. Watkinson's enterprise.

THE "AXE BRAND" CHLORIDE OF GOLD.

Fuerst Bros., 17, Philpot-lane, E.C.

IN forwarding us a sample tube of the "Axe" brand of gold chloride Messrs. Fuerst Bros. inform us that it has met with the general approval of both professional and amateur photographers. It is supplied in tubes of fifteen, thirty, and sixty grains (either bulb or cylinder shape) and the quantity of pure gold in the compound is stated on the label.



We employed some of the gold sent us in toning both collodion and gelatine prints, using phosphate of soda therewith, and found the tones we obtained all that could be desired. We note that the "Axe brand is listed as of English make.

PHOTO-ENGRAVING MADE EASY.

By JOHN LEMANE. Sydney: (N.S.W.), Harrington & Co., 66, King-street.

THE author outlines the half-tone process in the course of some thirty-six small pages. It is such a book as should be found useful by a beginner, all theoretical considerations having been avoided. Mr. Lemane is familiar with his subject, which he treats with clearness and brevity.

News and Notes.

WE are sorry to learn of the death of Dr. Paul E. Liesegang, of Düsseldorf which took place on the 5th inst., in his fifty-ninth year.

MESSRS. PERCY LUND & CO., LIMITED, will in future be known as Percy Lund, Humphries, & Co, Limited. The constitution of the Company remains exactly as before.

MR. J. E. THORNTON, of the Thornton-Pickard Manufacturing Company, was married, on August 24, to Miss Heaton, at Southport. There was a large gathering at the ceremony, and a reception was subsequently held.

ON Wednesday, the 2nd inst., Mr. Austin Edwards, the film-manufacturer, gave a dinner to his *employés* at the Holborn Restaurant, the party afterwards adjourning to the Gaiety Theatre to witness the performance of *My Girl*.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, September 16. The subject for discussion will be *Fixing Prints*.

MR. AUSTIN EDWARDS, of Willoughby-lane, Park, Tottenham, informs us that a Frena camera will be awarded monthly in competition for the best film negative on an Austin Edwards' film. The conditions and the necessary form may be obtained of Mr. Edwards at the address given.

LEWISHAM CAMERA CLUB.—An Exhibition of members' and past members' work will be held on September 28 and 29 in the Lecture Hall of the Lewishsm High-road Congregstional Church. Past members who have not received a notice are requested to at once communicate with Mr. H. M. C. Sprunt, 192, New Cross-road, London, S.E.

AN ART WRANGLE.—"When it comes to art encouragement," aaid the picture-hook, "I think I may modestly assert that a great deal depends upon me." "Pooh!" said the gimlet, "you yourself are absolutely dependent on the picture moulding. Now, I——" "Dear, dear," cried the screwdriver, "what a bore you are. Not one of you can compare in an artistic sense with my friend, the corkscrew, who is absent this evening attending an opening on the avenue." "What does he know of art?" aaid the tack-hammer. "What does he know of art?" repeated the screwdriver, scornfully. "You probably forget that he learned to draw wheu a mere infant, and that he has an unsurpassed pull in all well-regulated studios. What does he know of art, forsooth?" —*Detroit Free Press.*

PHOSPHORESCENCE AND X RAYS IN THE GEISSLER AND CROOKES' TUBES.—We have communicated to the Acc. di. Sc. fit. e mat. di Napoli (February 25, 1896) that a spark introduced into the circuit of a Ruhmkorff coil and of a Crookes' tube modifies the action of X rays. We call positive-air spark the spark introduced between the positive pole and the tube, and negative-air spark the spark introduced between the negative pole and the tube. With rigorous experiments we have found that a positive-air spark increases the effect of X rays and a negative-air spark diminishes it. By means of various arrangements, we have also obtained the Crookes' phosphorescence and the X rays from the Geissler tube. The following arrangement (bipolar inductive) gives the best results:—On the outside of a Geissler tube are glued two piecea of tinfoil, which are connected to the poles of an induction coil. These are also in communication with a graduated spark stand. When the coil acts, at every spark passing between the balls of the spark stand, a discharge passes through the tube and illuminates it. Contemporarily on the wall opposite to the positive tinfoil appears the Crookes' phosphorescence, which is accompanied by the X rays. The Geissler tube in this side is transformed, momentarily, in a Crookes' tube, while it maintains in the other regiona the properties of the low-vacuum tubes. In this arrangement the phosphorescence and the effect of the X rays depend upon the length of the air spark. There is a determined length, which produces the greatest action. When it is unnecessary to employ Crookes' tube to obtain X rays, the Röntgen phenomena may be produced by using low-vacuum tubes without electrodes. Our arrangements are, besides, used to concentrate the cathodic rays, and, consequently, the phosphorescence and the X rays, in a restricted side of a Crookes' tube. The concentration was also obtained by employing a magnetic field.—F. CAMPANILE and E. STROMEI, in the *Electrical Review.*

LANTERN-SLIDE MAKING ON THE DECLINE (?).—A friend draws our attention to the following curious paragraph in the *Daily Telegraph:* "One by one the recollections of childhood seem to be disappearing. Tastes have changed, and many institutions that were dear to the hearts of youngsters a quarter of a century ago no longer receive popular support. Among these must be classed what was once the magic lantern, but what is nowadays a costly scientific instrument, the very mechanism of which is enough to alarm the purchaser before he has dared to inquire the price. Lantern-slide making—an industry without which all the phantasmagoric apparatus ever invented is of little use—is on the down grade, and the only explanation is that the public demand for this form of combined recreation and instruction has diminished within recent years. Formerly, those engaged in this business had societies of their own, which assembled week by week to engage in social intercourse and the comparison of pictures. One of their last survivors has just been disbanded, simply because its members have no fresh slides to show one another, and it is idle to attempt to be cheerful at night when one has no business to transact during the day. The decadence of the magic lantern is an event that will be regretted by many who are not concerned with its commercial aspect at all." Evidently our contemporary soon found out that it had been deceived, for in a subsequent issue it had the following apologetic explanation: "It is interesting to learn that a West-end society of magic-lantern slide-makers that was recently disbanded failed rather from inanition than from adversity, and that, with the approach of the long evenings, an attempt will be made to resuscitate it into renewed vigour. Although scientific men have rather terrified some people by the elaborate names and the still more complex mechanism of the old-fashioned schoolroom favourite, in its simpler form the magic lantern is, we are assured, still cherished by the young. One London dealer alone had as many as fifteen thousand slides out on hire at one time last season, and the prospect for the coming winter is regarded as full of promise." Will some correspondent oblige us with particulars of the "West-end Society of Magic-lantern Slide-makers?"

THE "CLERK OF THE WEATHER."—The *Windsor Magazine* for September gives an illustrated account of the Offices of the Royal Meteorological Society, and throws much light on how the weather forecasts are made. "The connexion of the Office with the meteorological world outside is established by a single Wheatstone instrument and a private wire linking it with the central telegraph office in St. Martin's-le-Grand, through which it last year received information from about 250 districts in all parts of the British Isles. The Royal Meteorological Society supplies information in addition from some thirty of its own stations at carefully selected points, with its own officers in charge of them. From these and other trustworthy observers—persons in lighthouses and observatories, coastguard stations, and so on—there are received in Victoria-street sixty reports every morning, seventeen every afternoon, and twenty-nine every evening. The principal daily report—that transmitted at eight o'clock in the morning—is required to state what was the height of the barometer at six o'clock the previous evening, the force of the wind, the temperature, and the general character of the weather. It should also state the height of the barometer, direction and force of wind, sea disturbance, weather, and temperature by dry and wet bulb at the actual time of transmission, and it must say also what have been the maximum and minimum thermometer readings, and the total rainfall during the preceding twenty-four hours. If we stand by as they come clicking and rattling in by the Wheatstone, we shall find that they are not very suggestive of weather. What they really do present to the inquisitive onlooker, however, may be something like this: '97622 09549 96228 06253 50046 64485.' That may be the whole message, or a few words may be added, such as 'Gale began at seven p.m., ended at five a.m. Sky still overcast.' The numbers, however, constitute the main report, and in the morning they always consist of six groups, each of five figures. The first group relates to the barometer and the direction of the wind at six o'clock the previous evening, and will be understood to mean that the mercury stands at (2)9·76, and that the wind, as indicated by the 22, is W.S.W. Similarly, the second group refers to the force of the wind, the weather, and the temperature of the air. The 09 will be interpreted to mean that at the same hour the previous evening a strong gale was blowing. The figure 5 means that it was raining, and 49 was the temperature by the dry-bulb thermometer. The next two groups of figures give similar information for the time at which the message was dispatched, and the two following groups, read in accordance with the code, give the reading of the wet bulb: rainfall for the preceding twenty-four hours, the maximum and minimum temperature for the same period, and the condition of the sea at the time of dispatch."

Patent News.

THE following applications for Patents were made between August 24 and August 29, 1896:—

LENSES.—No. 18,723. "Improvements relating to Double Objectives for Photographic purposes." Complete specification. F. R. VON VOIGTLÄNDER.

CAMERAS.—No. 18,822. "Improvements in Photographic Cameras." L. J. R. HOLST.

FLUORESCENT SCREENS.—No. 18,859. "Apparatus connected with the use of Fluorescent Screens and Röntgen or X Rays." E. PAYNE.

DEVELOPING DISH.—No. 18,773. "Developing Dish for Photographic Films." Complete specification. H. O. BLAKER.

SCREEN KINETOSCOPY.—No. 18,884. "Improvements in Apparatus for Photographing Objects in Motion and for Reproducing or Exhibiting the Photographs of such Objects." Communicated by C. W. Schmidt and A. Christophe. G. F. REDFERN.

STEREOSCOPE.—No. 18,904. "An Improved Photograph-changing Stereoscope." Complete specification. W. A. FRIED.

SCREEN KINETOSCOPY.—No. 19,107. "Improvements in or connected with means for taking Photographs in Rapid Succession and similarly projecting them upon a Screen." H. C. FLEMING.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

September.	Name of Society.	Subject.
14.....	North Middlesex	*Enlarged Negatives by Means of Carbon Transparencies.* C. Beadle.
15.....	Birmingham Photo. Society .	Excursion: Gloucester. Leader, R. C. Cartwright.
15.....	Brixton and Clapham	Ordinary Meeting.
15.....	Gospel Oak	*Toning and Manipulating Solio Printing Paper.* W. J. Ramsey.
15.....	Hackney	Open Night.
16.....	Borough Polytechnic	Open Night.
16.....	Photographic Club	Fixing Prints.
17.....	London and Provincial	*What is the Best Way of Mounting P.O.P. Prints?* E H. Bayston.
19.....	Borough Polytechnic	Excursion: Purley and Caterham.
19.....	Leytonstone	Excursion: Waltham Abbey. Leader, G. U. Haslam.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 3,—Mr. R. Beckett in the chair.

A letter was read from the Hon. Secretary of the Photographic Club, inviting the members of this Association to join them at their annual outing at Hampstead this year.

Mr. ASHBY showed a much faded print of about four years old which he wished to copy or restore, and wanted to know how to set about it.

Mr. HADDON thought it might be possible to restore it by converting the silver into chloride and developing, but it was rather risky.

The CHAIRMAN said perhaps intensifying with uranium would be of use, although he could not speak from experience. The reason was that you would get a red image, which could then be copied in the camera.

Mr. HADDON said that would do only where metallic silver was present, but it was a question whether there was any metallic silver to act upon.

Mr. W. D. WELFORD read a paper on—

PHOTOGRAPHIC EXHIBITIONS AND PROGRESS.

He thought a manifest improvement followed competition, and advocated the continuance of Exhibitions and competitions. Most of the opposition came from those who did not exhibit at all, but as soon as a man begins to exhibit his opposition ceases. The main factors in the pictorial progress of photography were Exhibitions and competition. Some cry out that there are too many Exhibitions. This may apply to London, but not, he thought, to the

country districts. He suggested that, as far as London was concerned, the Pall Mall, Salon, and the larger shows would answer all the educational purposes. As to whether Exhibitions had seen their day, he thought the reverse. All the best photographers of the day have commenced by competing at Exhibitions, and most of them recognised the progress they had made, and do not clamour for abolition. Some, on the other hand, as soon as thirty or forty medals had fallen to their share, thought the need for them at an end. Speaking about the merits of some of the prize pictures at Exhibitions, he said, although we may not agree with the Judges in some cases, a good deal could be learned as to why our own productions had not been medalled. With reference to the attacks levelled at medals, he said it was quite an individual taste what shape awards should take. Regarding the practice at some shows of offering very large numbers of medals, for all that, the Royal Photographic Society's medal was none the less precious. Money was not now, he considered, so important, and brains stood a better chance. Nothing had done so much for the advance of photography as the oft-despised Exhibition.

The CHAIRMAN asked whether they were technically producing better photographs than in years gone by in consequence of these Exhibitions. He thought the technical as well as the artistic sides deserved a lot of attention, and that the prize-winners would be found to devote a considerable amount to both. He deprecated the large increase in the number of classes.

Mr. FRESHWATER thought it a great incentive to exhibit when awards were given for the best work, and expressed the opinion that the Royal Photographic Society's medal was far in advance of anything offered to competitors in value.

Mr. WELFORD said for years technical merit had ruled the roost, and they had never tried for anything but that, but now they were going beyond. The more one tried to improve his picture artistically, the more technical knowledge he acquires. The most artistic photographer was really the most technical. In regard to the often-suggested course that Judges should give their reasons for awards, he did not think it their duty. They only had to give their judgment and go home.

Mr. MACKIE asked Mr. Welford's grounds for saying that medals used to be given solely for technical excellence, and strongly disagreed.

Mr. WELFORD asserted that there was no artistic merit thirty years ago.

Mr. MACKIE thought it a question of the fashion of the time, and that many of the pictures taken at that time would secure medals now *artistically*.

Mr. WELFORD said they might take them *technically*, but not artistically.

PHOTOGRAPHIC CLUB.

SEPTEMBER 2, Mr. Thomas Bedding in the chair.

The HON. SECRETARY announced that Mr. Horsley Hinton would deliver a lecture on Wednesday, October 7, upon *Pictorial Photography*. The lecture would be illustrated by lantern slides.

Mr. BRIDGE also announced that Mr. Snowden Ward would give the first Travellers' Night on September 30. Subject, *Shakespeare at Home*, illustrated with lantern slides.

Mr. Drage showed some photographs by Mr. Jackson, a photographer of Oldham. These pictures showed boys occupied in playing various games which had become obsolete. The pictures, which were awarded a medal at Liverpool, were excellent. Mr. Drage also showed some silver prints "made in Japan." The photographs were 10×8 size, printed on albumen paper, and were sold at 4*d*. each. Coloured, the price was raised to 6*d*.

Mr. WELFORD then read a paper on

THE MANAGEMENT OF PHOTOGRAPHIC SOCIETIES.

He said that he did not profess the intention of teaching hon. secretaries their work—the majority of them knew it already. He queried the advisability of meetings in the summer months, stating that the tendency of poorly attended meetings was to become more or less contentious. In many societies it was the impression that, when officers had been elected, the work of the Society for the year was done. He thought, however, that it was the duty of the members to do the work, and of the officers to make necessary arrangements. In other words, the members of the Society should by their enthusiasm carry it on. Membership of a society should involve giving something to the society as well as receiving something from it. When the members were apathetic, the officers were compelled to become too energetic. This might result in their becoming officious. Another difficulty which met every society was the need of good papers. There should not be too much technique, and even a little humour at times was acceptable. It was as necessary that the papers should be well delivered as that they should be good. He advocated the adoption of a series of evenings for "beginners," and severely jumped upon Mr. "Know-it-all," who sometimes damped the ardour and energy of the younger members. With regard to the election of a Chairman, Mr. Welford asked if it is wise to have a different Chairman every meeting. He stated as a fact that he knew of much trouble caused by the changing system, and he suggested electing a suitable man to the post for a year. He was in favour of the formal discussions of papers. Very often the best points were drawn out either in the discussion or in the author's reply. One of the best ideas he had met with (he thought it was due to Mr. Haddon) was the suggestion that members should place upon the notice board the subjects of papers upon which they were desirous of information. Mr. Welford thought that regular excursions were a mistake, and that photographic "outings" should partake more largely of a social character than was often the case. Referring to formal business, he alluded to the divergences in practice which obtained. At some societies the most elaborates minutes were read, whilst at others the press report was snipped from the weekly paper and pasted in the minute book. Mr. Welford concluded with a general statement that the officials did not "make" the society, but that a successful society depends upon the energy of the members themselves.

Mr. BRIDGE said that the question of whether the Photographic Club should meet in the summer time was one entirely for the members. The Club had always met week in and week out from its formation. If any alteration were desired, the rules could be altered. Upon the question of members working and the delivery of papers, Mr. Bridge was quite in accord with the reader of the paper. He had had some experience as Secretary of several societies, and, if the members would only be induced to come forward with papers, the work of the officials would be considerably lightened. As far as a Beginners' Night was concerned, that was a question which was in the hands of the members themselves. As regards the change of Chairman, there were several sorts of Chairmen, the man who knew his work and did it, the man who did not know his work but did not mind being told by the Secretary, and the man who did not know and would not be told. The custom of the Photographic Club had been to elect a Chairman week by week. He thought Mr. Welford's suggestion of a series of Lantern Nights to be called "My Holiday Trip" a good one. It only wanted carrying out.

Mr. SLATER, a visitor from the South London Photographic Society, agreed generally with the paper. As regards the excursions, to be successful these must be continuous. His Society, in which the excursion department was well supported by the members, had a separate Excursion Secretary, and this arrangement was found to work satisfactorily.

Mr. DRAGE, who had had considerable experience in society management, said that he did not approve any system of "worrying" the members for papers. As far as the excursion question was concerned, the essential requirement was first-class management. He did not understand that Mr. Welford, in his paper, referred altogether to the Photographic Club.

Mr. WILKES, who is a member of the Birmingham Photographic Society as well as of the Photographic Club, said that at Birmingham they had a President and four Vice-Presidents. The Hon. Secretary arranged with the latter in rotation to occupy the chair at the various meetings of the Society, and this method was found to work satisfactorily. The Birmingham Society also has an Excursion Secretary, and the excursions formed a strong portion of the programme, and were a successful feature.

Mr. FRY said that he did not agree with many of the suggestions which Mr. Welford had made so far as their possible application to the Photographic Club was concerned. The Club was a mature one, and they had not appealed strongly to the tyro, or to the man who thought he had a passing fancy to take up photography. Looking through the list of members, he would say that, roughly speaking, they had no beginners as members. The Club had to consider what was the average type of its members, and to pursue that course which was most acceptable to the majority. As far as excursions were concerned, he looked upon them as being dead. The fact was, the majority of the members did not appear to want to go an outing. Doubtless a good Chairman was an especial advantage, but he had never observed that the Club had any difficulty in getting a Chairman, or that their Chairmen were inefficient. As far as papers were concerned, he said that the Photographic Club had had some of their very best papers and meetings during last session. They had decided on subjects of interest which had attracted on several occasions a room full of members and friends. The Club had always extended a hearty welcome to non-members.

Mr. BEDDING said that the discussion had drifted from the general to the particular—to the management of the Photographic Club itself. As regard the excursions, he thought that the members were not so enthusiastic about outdoor work as they were. A more vital reason was that the members of the Club were drawn from all parts of London, and consequently an excursion in any direction would possibly be inconvenient to a considerable number. The Photographic Club is a cosmopolitan one, and its circumstances are different from those which obtain in a local organization. He looked upon the Beginners' Night as foredoomed to failure. Being in the chair himself that evening, he agreed with what had been said upon the subject of the Club Chairmen. He would like to see the Club stop their summer meetings. His impression of them was that they were not successful. Learned societies had a vacation, and the one with which the members were most closely connected, the Royal Photographic Society, closed its doors from June to September. He believed that the rest added zest to the meetings when they were resumed, and he pointed out that there was an opportunity at the forthcoming annual meeting for Mr. Welford to introduce any of the reforms which he thought would be of benefit to the Club.

Mr. WELFORD, in his reply, stated that his paper was not intended to be specially applicable to the Photographic Club. It was intended to be of general application. The idea underlying his remarks was that a society should live by the energy of the members rather than by the energy of its officials. He was surprised at the conservative nature of Mr. Fry's remarks, but he noted with special pleasure Mr. Bedding's reference to the vacation.

Mr. BRIDGE proposed a vote of thanks to Mr. Welford for his paper, and added that they were not too conservative to try any good suggestions. The resolution was carried.

Croydon Camera Club.—On Saturday, the 29th ult., a party of members of the Croydon Camera Club, led by Mr. Rogers, had a most enjoyable outing to Greenwich College. The journey was made by boat from London Bridge, and the many interesting subjects *en route* afforded ample opportunities for hand camera workers, which those present did not fail to avail themselves of, and many "snaps" were made. We think there must be a vast field for this kind of work on the river Thames, and wonder we have not more trips by water to record. Arriving at Greenwich pier, the party were met at the College gates by Mr. Haddon and Mr. Collins, who very kindly conducted them round and pointed out the many beauties of this grand institution. Mr. Haddon, the Physical Demonstrator to the College, takes a keen interest in photography, and is well known for the valuable papers he has contributed on the subject, one of his most recent ones being that read at the Convention meeting on *The Washing of Photographic Prints*, and under his guidance many fine views were pointed out of the various parts of the building, and the time was all too short to allow of everything being done; but the party were by no means idle, for about 150 exposures were made, and at the finish a stereoscopic group was taken on the steps under the pediment illustrating "Nelson's fifty battles," the exposure being made by Mr. Collins. After this, Mr. Haddon very kindly showed the party through the suite of physical laboratories, workshops, casting and engine-rooms, &c., and explained the principles of some of

the numberless pieces of costly and elaborate apparatus used in physical research, amongst which, and particularly interesting to photographers, was a fine induction coil used in conjunction with a Crookes' tube for experiments in radiography, together with Spregnel and Giessler air pumps for exhausting vacuum tubes, one of which was connected with the pump, and the various luminous effects produced by passing a succession of sparks from the coil through the tube during the progress of the exhaustion was intently watched and much appreciated by the party. There is a complete plant for generating and storing electricity for lighting and experimental purposes, comprising dynamos of various types, accumulators, primary batteries, Wimshurst and Holtz machines, apparatus for correcting binnacle errors, acoustic, pneumatic, optical, and general scientific instruments *ad infinitum*. Mr. Haddon very patiently and pleasantly replied to the many queries addressed to him as to the uses of the different instruments, and there is no doubt that many returned home with other than photographic "wrinkles" added to their store of knowledge. After leaving the College, the party partook of a typical Greenwich tea, which was done ample justice to, and the return home by tram and train brought to an end a most successful excursion.

North Middlesex Photographic Society.—September 4, Mr. Golding in the chair.—Mr. Gosling showed some prints on Venus paper, which had been distributed at a previous meeting. A discussion took place on the most suitable paper for sensitising, and Creswick drawing paper was well spoken of. Messrs. Golding & Goodwin showed some fine examples of pinhole photography, and Mr. Child Bayley also brought up some negatives and prints therefrom, also taken by means of a pinhole. In the competition for prints taken at the Cambridge and Lowestoft outings, which were merged into one, Mr. Mummery took first place with a photograph taken at Lowestoft, and Mr. Smith second with one at Cambridge. A vote of thanks to Mr. Golding as Chairman concluded the meeting.

Aintree Photographic Society.—September 4.—The chief item was *Platinotype*, by Mr. GEORGE ASHLEY, and this was ably demonstrated. This Society's third Annual Exhibition is fixed for the first week in December. Particulars of open competitions may be had from the Exhibition Secretary, E. P. Heron, 1, Tilney-street, Aintree.

Leeds Photographic Society.—The opening lecture of this Society was given in their rooms at the Mechanics' Institute on Thursday, the 3rd inst. (Mr. Godfrey Bingley in the chair), when Dr. J. T. THRESH took for his subject—

THE PHYSICAL AND CHEMICAL PROPERTIES OF THE NEW GAS, ACETYLENE.

After describing the combination of calcium with carbon in a synthetical manner, he drew attention to the fact that, though acetylene was produced from inorganic bodies, yet an organic body was thus formed from which all other hydro-carbons can be built up for illuminating purposes, and that it is really converted into other bodies, from which thousands of most valuable derivatives may be obtained, stating that all these important bodies, which have been hitherto obtained from coal gas, may now be made from acetylene. He then described how Mr. J. L Wilson, an American chemist, first produced it in the electric furnace by accident, a process by which its price is so lowered as to make it of commercial value. Next he gave the quantities required to make the calcic carbide, its physical properties, the amount of gas it will yield, together with its cost, demonstrating the manufacture of the gas by the addition of water, and showed his audience that it was a colourless gas, and made itself apparent to the olfactory nerves, had an exceedingly bad smell, considerably worse than that of garlic. Its solubility in various solutions was also mentioned, its explosive properties with the atmosphere were also demonstrated, and the dangers of such mixtures were fully pressed upon the audience, he himself having had a very narrow escape from an accident whilst experimenting with the gas. Attention was then drawn to other peculiarities, viz., its illuminating power compared with other hydro-carbons, especially Leeds gas, the condensation to a liquid at about twenty-one atmospheres, and the probability of its being solidified, its portability and method of distribution, its manufacture on a small scale, and its danger of combining with certain metals, forming fulminates, its uses in the enrichment of other gases, and the small percentage of obnoxious compounds formed by combustion. The lecturer then drew the attention of the members to its application to photography, making it useful to the Society, particularly mentioning the superiority of the light for home portraiture, giving details as to how the light should be placed and used to obtain results little inferior to those obtained in a well-appointed studio by sunlight. Enlarging and reducing were well described within the limits of this gas, and too much could not be said in its favour for micro-photography. Its use in the lantern for projection purposes, the arrangement of burners, the amount of light they will give, the size of the screen they will illuminate, together with its simplicity of management as compared with the oxyhydrogen light, render it most invaluable to the lanternist for small audiences. A hearty vote of thanks, proposed by Mr. J. W. Addyman and seconded by Mr. G. H. Rodwell, brought the meeting to a close. It was announced that Messrs. Richard M. Somers and Lionel H. Teale had been elected members of the Society.

Sheffield Photographic Society.—The monthly meeting was held in the Society's Room, Masonic Hall, on Tuesday evening (the 1st inst). In the absence of the President, the chair was occupied by Mr. G. H. Day. After the transaction of ordinary business a demonstration, *Enlarging on Bromide Paper*, was given by Mr. G. TOMLINSON. The manipulation of this paper was carefully explained, the methods adopted for vignetting and printing in clouds from separate negatives shown, and exposure was then made on a piece of 12×10 paper and developed, the negative used being half-plate and the illuminant incandescent gas. Mr. TOMLINSON exhibited a number of prints made by him, and they were much admired. A hearty vote of thanks to the demonstrator brought a profitable evening to a close.

1896. FORTHCOMING EXHIBITIONS.

Sept. 24-Nov. 7 ..... Photographic Salon, Dudley Gallery, Piccadilly. Alfred Maskell, Dudley Gallery, Piccadilly.

Sept. 28, 29 ..... Lewisham Camera Club. H. M. C. Sprunt, 192, New Cross-road, London, S.E.

,, 28-Nov. 12 ... Royal Photographic Society. R. Child Bayley, 12, Hanover-square.

Dec. 1896-Jan. 1897 Bristol International.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

REMEDIES FOR HALATION.

To the EDITORS.

GENTLEMEN,—I am, as you may know, much interested in anti-halation, and seeing some remarks in your issue of to-day, "Ex Cathedrâ," on the subject, allow me to say I think them somewhat premature. The discovery may be original and effective, and I anxiously await the publication. When visiting Mr. J. E. Bruton, of Douglas, Isle of Man, the other day, he called my attention to the circular. I immediately explained, in confidence, a method I thought out some time ago which savours very much of it. As far as I know, mine is original.

As there are several kinds of halation, I cannot conceive any one method that will meet the difficulties; but a combination will be advantageous. I trust that the method mentioned in the circular will throw some light on the subject. I am never behind in paying for information, should it be original.—I am, yours, &c.,

A. L. HENDERSON.

277, *Lewisham High-road, S.E., September* 4, 1896.

To the EDITORS.

GENTLEMEN,—In your issue of September 4 you have two paragraphs referring to a circular which I considered ought to be in the hands of every photographer.

The plan or method (not backing) came about in this way. I had been trying for many days to get a photograph of the interior of a chapel, the east window of which has a considerable amount of transparent glass. The result was very unsatisfactory.

My assistant, who is of a practical turn of mind, suggested an idea, and I at once was so pleased with it that I immediately adopted it, being most anxious to get the best effect, the result of which you will see from the two photographs sent per this post.

The method is so simple that the most inexperienced could use it.

My assistant suggested, after we found the result so gratifying, that we should keep it to ourselves, but I thought otherwise, as I had derived so much advantage from it. So we mutually issued the circular referred to as a means of aiding other photographers to benefit by it at a small cost. I would gladly have given a five-pound note for it.

I am pleased that Mr. A. Freke has been the means of bringing the subject so prominently before the photographic world by the aid of your valuable JOURNAL.

Thanking you in anticipation for the insertion of this letter,—I am, yours, &c., GEO. A. DEAN, *Photographer* (*late of the Isle of Man*).

14, *High-street, Rugby, September* 8, 1896.

[The non-halated picture, compared with the other, is very good, but not better than similar results we have seen produced by backing the plate, or reducing the halated parts of the negative.—EDS.]

PHOTOGRAPHIC RESEARCH.

To the EDITORS.

GENTLEMEN,—I noticed recently that, in an address at one of the Society meetings, you spoke of more definite and organized research being needed, and giving an idea of how it might be accomplished.

I agree with you that far more might be quickly done, and, seeing that 999 out of 1000 photographers do not care anything whatever about the why and wherefore of results, it must rest almost entirely with the journals to foster, perhaps organize, such investigations.

Photographic science is, doubtless, in its infancy, and at present under a cloud, so that progress is very slow.

I suppose the present is a stage through which all sciences pass, but when you carry your ideas a little into practice I shall be glad to know, and, if possible, do my part.

At present the whole subject seems to be left in the hands of those who desire to make a name for themselves.—I am, yours, &c.,

JOHN STERRY.

3, *Prince's terrace, Cavendish-road, Felixstowe, September* 2, 1896.

ABOLISH THE PATENT LAWS.

To the EDITORS.

GENTLEMEN,—The readers of technical journals and the newspapers are quite surfeited by notices of real or imaginary histories of inventions and discoveries, each setting up a claim, for himself, or somebody else, as the first inventor. Now, I respectfully submit, that the time has come, owing to the existence of a higher intelligence, and the extension of technical knowledge, to consider the question whether it is possible for a *single person* to be of himself a true and *only* discoverer of a novelty. Progress depends not for its success upon any single individual effort. The laws of nature are not partial, they are within the grasp of all, and no man has any right to place a barbed wire fence around any particular application of laws that were created for the universal convenience of all. It has been demonstrated, over and over again, that similar ideas occupy the minds of persons resident on both sides of the globe simultaneously. Inventors are continually at loggerheads at the Patent Office, and soon the nuisance will become, if not already, intolerable.

I am reminded to write upon this subject by reading an imaginary story of the "discovery of zinc etching and photo-lithography" in this week's JOURNAL.

It matters little to myself, and less to the public, I suppose, when I affirm that the story is not according to fact in any particular. Zinc etching was a commercial article long before Sir Henry James reached the Southampton ordnance establishment, and photo-lithography was in active operation in Messrs. Nelson's, Edinburgh, before it was started at Southampton. I have read this story before, in print, years ago; it is absolute nonsense, and, if Sir Henry was alive, he would join with me in disclaiming it. I have had the pleasure of the Colonel's acquaintance at Southampton, and during prolonged interviews Sir Henry never laid claim individually to either zinc etching or photo-lithography as being the inventor. His whole boast was "that he had a *staff of experts* who could accomplish anything;" and, after personally inspecting the extensive works, I considered him fully justified in his assertion, for in all my long life experience of over fifty years, actively engaged in *printing-ink photography* and lithography, here and in America, I never met a better or higher class of workmen than those at Southampton at that time (1867).

But I am digressing from my subject. I believe I am not alone when I say the patent laws should be utterly abolished, on the same lines as has been done with all taxes upon knowledge and postal intercourse, which now has full swing in the penny stamp. The patent law is a huge injustice to the inventor himself, and in practice it is simply the law of the "squatter," and an obstruction to the universal welfare of the world's progress. The Government fees and the grasping of the moneyed speculator leave the inventor the bare bare bone to subsist on. Who can deny it?

Why should these "brakes" to the wheels of progress be applied at all? The powers of invention are crippled and handicapped by patentees who have extracted the germ of their invention from the brains of others. The protection given to inventors belongs to a very primitive state of society, the day of its usefulness has passed, and the world's progress demands that all hindrances placed against its forward march must be cleared away, that the intellects of the whole world may have free scope to exercise and reap the profits to the full of their fertile minds and deft hands, without Government interference or the nefarious huckstering of capitalists in search of food to sustain their "horse-leech" appetites.

I conclude by stating that two gentlemen inventors of the United States are, between them, credited with obtaining no less than a thousand patents! JOSEPH LEWIS.

Dublin.

THE UNFORTUNATE CHEMIST.

To the EDITORS.

GENTLEMEN,—This is the silly season when the big gooseberry rears his hairy head, and the sea serpent winks the other eye, and newspaper correspondents and penny-a-liners nibble their pens and twiddle their thumbs for lack of copy.

But, bless me! what a godsend it is that there is one time during the year, when we can grind out twaddle—and get it printed too—and generally write without rhyme or reason and not be accounted fit inmates for a lunatic asylum.

Here is "Dogberry," banging his head on the good old substantial pharmaceutical rocks and evidently getting well bruised in the bargain, as shown by his inability to write logically and fairly. He has donned the spectacles of prejudice and passion, and selects an eminent Edinburgh firm and contrasts them with "a little country chemist with shop floor and linseed oil antecedents."

We have a term here in Lancashire which fitly expresses the conduct of any person who adopts extremes. He is either staring or stark mad, they say.

But I have yet to learn that it is not wise to begin on the lowest rung of the ladder, and surely the knowledge of the handling of a broom is no disqualification for the selling of a pound of hypo. I myself have commenced the day in the manner "Dogberry" describes, sold a pint of that "bête noir" of his, proceeded to make an analysis of urine for a member of the medical fraternity, effected the sale of a Wray's lens, and extracted a couple of teeth, and yet I am able to understand "Dogberry's" gush.

The height of absurdity is reached, though, when an attempt to describe the subjects of the chemists "exam." is made. Sufficient *quasi* botany and materia medica he says, and then stops. What about the other subjects, friend "Dogberry?" Is our knowledge of them thorough, or *quasi*, or none at all? or are there any more subjects? I advise your able correspondent to rub his nose over the pharmaceutical curriculum before he writes again to amuse your readers.

Really these two champions of the photographic dealer must be more careful. "Cosmos" rants off a length one week about the chemists mercilessly cutting prices, and then "Dogberry" steps in with his little lot to the effect that he has been ridiculously overcharged.

Gentlemen, if you wish to make any impression on the pharmaceutical citadel, be sure you have got the right weapons, learn how to use them, and do not mix your ammunition. When two horses are employed, it is usual for them to pull in the same direction; if they are yoked at opposite ends of the coach, very little is accomplished, and the driver looks foolish.

But it is the silly season.—I am, yours, &c., WILLIAM HAMPSON.

Leigh, September 5, 1896.

"PHOTOGAROMS."

To the EDITORS.

GENTLEMEN,—For a kind of coloured pictures, exhibited in various windows, the above expression is used. Will you kindly explain in what manner they are obtained?—I am, yours, &c., H. BRAESS.

Liverpool, September 1, 1896.

[Our correspondent probably means "photo-chroms" These pictures are produced by a secret process, which is probably a combination of photographic and chromo-lithographic printing.—EDS.]

THE PHOTOGRAPHIC SALON.

To the EDITORS.

GENTLEMEN,—Will you allow me to call the attention of your readers to the fourth Exhibition of the Photographic Salon, which will open at the Dudley Gallery, on Thursday, the 24th inst.

May I also remind intending exhibitors that all pictures for exhibition will be received at the Gallery on *Monday, the* 14*th, only*, between the hours of 11 a.m. and 6 p.m. Entry forms may still be had on application at the Gallery, or by letter.

Messrs. Dickseé of 7, Rider-street, St. James's, S.W., the well-known exhibition agents, will undertake to receive, deliver at Gallery, and return exhibits on very moderate terms.—I am, yours, &c., ALFRED MASKELL,

Photographic Salon, Dudley Gallery, *Hon. Sec.*

Egyptian Hall, Piccadilly, W., Sept. 1, 1896.

LEYTONSTONE CAMERA CLUB EXHIBITION.

To the EDITORS.

GENTLEMEN,—I regret to inform you that, owing to the loss of our studio and club property, we reluctantly feel compelled to announce that our usual Exhibition will not be held this year, but we hope to have a special Exhibition of members' work early in the new year.—I am, yours, &c., B. HARWOOD, *Hon. Secretary.*

110, *Windsor-road, Forest Gate, E., September* 4, 1896.

[We are sorry to learn that the Leytonstone Club's open Exhibition will not be held this year, as the previous displays organized by the Club have invariably been extremely good.—EDS.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

William Harrison, Kewaigue, Braddan, Isle of Man.—*Photograph of storm in Douglas, Isle of Man.*

COLONEL GURBINS.—Received. A little misplaced ingenuity on the part of the printer.

FERROTYPE PLATES.—BEGINNER. Fallowfield stocks them, and also some ready-sensitised, we believe.

W. L. N. (Northwood).—The idea is to endeavour to make question and answer generally as well as particularly instructive.

"BENNETTO'S COLOUR PHOTOGRAPHY."—Dr. W. H. PLAISTER. Many thanks for your letter, which we must decline to publish. But please interpret our refusal in the most courteous sense.

PRESERVATIVE OF PASTE.—P. F. S. says: "Can you tell me what is the best and cheapest stuff I can add to paste, to prevent it turning sour?"—In reply: The addition of a little glycerine and oil of cloves, at the moment of preparation, will probably answer.

SPOTTING GELATINE PRINTS.—E. BATH. You probably did not match the colour of the print. If this be done, and the water-colour pigment be thinned down with a little gum water, the marks should not easily show. If using oil colour, dilute with methylated alcohol.

VARNISHING NEGATIVES.—Any of the formulæ given in the ALMANAC are suitable for gelatine negatives; but, as you are an amateur and small consumer, you will possibly find it answer your purpose better to buy varnish from any of the dealers than make it yourself. By doing so you will ensure having a suitable article.

COPYRIGHT.—NORTH BRITON. The portrait being taken in the ordinary course of business, you have no copyright in it. The negative is your property, it is true, but you have no right to use it for any purposes, except to the sitter's order. The sitter can, of course, have the prints you have supplied copied or enlarged by any other photographer.

EARLY PHOTOGRAPHY.—G. WAKLEY. From Hunt's *Photography* you will be able to obtain a great deal of information about the early processes of photography and their working details. There are several editions of the work, which has been out of print for many years. Copies may be now and then met with at bookstalls for small sums. An advertisement or two will, no doubt, put you in possession of a copy.

GELATINE.—T. WADE. By continually heating a solution of gelatine, or keeping it heated for a long time, it becomes impoverished, and loses much of its quickly setting properties. A poor quality gelatine suffers much more quickly than does a high quality one in this respect. The solution may, however, become very greatly impaired, but the gelatine may still retain a considerable amount of its adhesive properties.

PORTRAIT GROUP.—P. MOSS. The portrait lens will, unquestionably, be the quickest acting. But, for an outdoor group, you will get on better with the rapid rectilinear, because it will cover the plate better, and with more even illumination. If the former were used, it would have to be stopped down to such an extent, to get all in focus, that it would then be no quicker than the other, while the result would not be so good in the end.

COLLOTYPE.—T. MORRIS. We think you are misinformed. We have never heard of collotype plates, ready prepared for exposure, being kept as stock articles by the photographic dealers in Germany. We know that the glass is stocked with a ground surface and with bevelled edges, and this is the nearest approach to "ready for use" we are aware of. When a collotype plate is prepared, it must be printed within a day or two, as it will not keep.

TAX ON VEHICLE.—A. Z. complains that he is taxed for a light trap that he uses in his business to take him and his apparatus from place to place where he has work to do, and asks if that is according to law, or should he appeal against the impost?—The trap, if used exclusively for business purposes, is exempt from taxation; but, if it is used, even occasionally only, for pleasure, a drive out on Sundays, for example, then it is liable for the tax.

REMOVING INK STAINS FROM NEGATIVES.—MORGAN says: "I have printed on a negative. Would you kindly inform me what will remove the ink, without destroying the negative, and reduce the density?"—In reply: Try the following plan, which answers for prints. Dissolve one drachm of oxalic acid in an ounce of warm water, and, having wetted the surface of the negative with warm water, apply the solution, and rub gently until the ink disappears. Keep it warm throughout.

RESITTINGS.—HARD TO PLEASE. Either the sitter is very unreasonable or the work must be inferior; otherwise, with six resittings, the customer would be satisfied. We note on the circular, on the back of which your communication is written, that sittings are given till satisfied. In face of that, the sitter seems within her rights in what she is demanding. Clearly, at your prices, you will be a loser on the transaction, even if the next sitting pleases; but it cannot be helped if your terms are as the circular shows.

DETENTION OF NEGATIVES.—COUNTY PHOTOGRAPHER writes: "More than three months ago I sent half a dozen negatives to a certain enlarger. On receiving half the order I sent another negative for another. I have repeatedly written for them, and cannot get them or my negatives, or even an answer back. Perhaps you or some of your readers could advise me what is my best course to take to recover my negatives."—Communicate with the Superintendent of Police of the locality where the enlarger resides.

COPYRIGHT.—H. P. H. says: "The following is a question I should like to ask you *re* copyright:—We will presume A. and B. have permission to photograph the interior of a building. A. takes a picture, and makes it copyright. Does that prevent B. from taking the same view for sale, or does it only protect copying the actual picture taken by A.?"—In reply: Registration of copyright only protects A.'s actual photograph, and does not prevent B. taking the same view for sale. Any number of photographers may take the same view from exactly the same point, and copyright the photographs.

USE OF DARK ROOM.—C. W. Of course we shall not publish your letter. What have you to complain of? We should say that the professional who told you that you could have the use of a dark room for changing your plates before business hours was very obliging. You cannot expect professional photographers to stop their business for a stranger to use their dark rooms. Business is none too good with them, even were there a combination, as alleged, amongst the photographers of that place, against lending amateurs their dark rooms. What then? Are not their premises their own?

STUDIO AND BUILDING ACT.—W. W. R. We do not know how the by-laws of the authorities in your town stand, but we may say that you would not be permitted to put up such a wooden studio within the authority of the London County Council. The best suggestion we can make is to get out a rough sketch of what you propose, and submit it to the district surveyor to the Council, or any other surveyor in the town, and hear what they have to say about it, before commencing the erection, the more particularly as your neighbours on either side object to anything like a studio being put in the garden.

TELLING THE COLOUR OF AN ORIGINAL FROM THE NEGATIVE.—H. says: "Is it possible for a photographer to tell, by examination of a negative only, what colours the original object possessed? I shall feel greatly favoured if you can give me your reply in the next issue of your valuable paper. Some amateur friends of mine would like to know. Of course, the photographer would not have seen the object photographed."—In reply: An experienced photographer could hazard a tolerably safe guess, we think. Much, however, would depend on the nature of the original, and whether it had been photographed orthochromatically; but, generally speaking, it is possible for a photographer to do so.

R. H. U. E. says: "I shall be much obliged if you will inform me what is the correct proportion of the two acids, nitric and hydrochloric, to make aqua regia. The acids I use are pure and concentrated, *i.e.*, P. B. strength. Also, what would be the theoretical quantity necessary to just dissolve 100 grains of fine gold? Captain Abney gives the proportion of one pint of nitric, and five pints of hydrochloric, whilst others say one to three."—In reply: 1. Proportions of 1:3, 1:4, 1:5 are recommended by various authorities, with a preponderance, we think, in favour of 1:4. 2. The information will probably be found in Storer's *Dictionary of Solubilities* to which we refer you. We have not the precise information handy.

PANORAMIC CAMERAS.—L. JEFFREY says: "I should be very glad if you could give me any particulars of cameras for taking panoramas complete. I have made a camera which works all right, but am informed to-day that there are several others already in existence. I should be very glad if you could tell me how the cameras work, or, better still, give me the numbers of the patents if they are patented, so that I might see clearly from the specifications how the motion is obtained."—In reply: We cannot refer you to individual specifications, but an hour spent at the Patent Office library would put you in possession of the necessary data concerning patents for panoramic cameras that have been taken out in recent years. The article in our 1892 ALMANAC on *Photographic Panoramas and the Means of Making Them* describes several panoramic cameras, and would probably be useful to you.

REMOVING SILVER STAINS FROM NEGATIVES.—SERIOUS says: "Will you kindly inform me how I can take silver stains from negatives? I have often seen used a little hypo (few drops), mixed with a saturated solution of cyanide of potassium. Yet, when I used it, no effect was shown. The stains in question were only on negatives about an hour or less. Sulphocyanide of ammonia and nitric acid were tried, but with the same result. The negatives had been varnished, which was thin; methylated spirit was used to remove the varnish before applying other solutions. Would the methylated spirit affect the stains so as to increase the difficulty of removing them?"—In reply: There are two other methods which might be worth your while to try—1. Rub the stains with a little alcoholic solution of iodine, and then apply a solution of cyanide of potassium; 2. A strong solution of potassium iodide, and apply friction. But we know of no really satisfactory formula, although a solution, sold for the purpose by Messrs. Marion, and that we used some two or three years ago, is about the most effective.

ENLARGING WITHOUT THE AID OF A CONDENSER.—W. J. H. writes: "During the coming winter I wish to do some bromide enlargements, and, as I cannot make use of the daylight, I would be glad if you could inform me my best way to do it with the aid of paraffin lamp or lamps. I wish to enlarge from half-plate negatives, and want the illumination to cover the plate from corner to corner as in the case of views. I know it can be done with a large condenser, which means an outlay far exceeding my means. Is it possible to make a condenser with two glasses cemented in a tube and filled with water? I fancy I have heard of a clock-face glass condenser made in this way. Shall esteem it a favour if you will let me know through your paper my best way to proceed in the simplest, most economical, and practical method to this end."—In reply: 1. A large condenser may be improvised in the following manner:—To a concave glass of about thirteen inches diameter cement a sheet of glass to fit it, leave a small opening, and fill in with pure glycerine. 2. As economy is your chief aim, you may dispense with a condenser in either of the following ways: (*a*) Construct a square box with an opening at the top for a metal chimney. Place a powerful lamp inside, and fit the box close up to the back of the camera which holds the negative. (*b*) Arrange a large sheet of white cardboard as a concave radiator, and place a lamp each side of the concave surface. This will transmit a great volume of light through the negative. This method is a perfectly practicable one, as we know by experience, and is extremely cheap to improvise. Doubtless, from the rough idea here given, you will be able to work out the system for yourself.

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OUR FORTHCOMING ALMANAC.

The time of year has arrived when it is necessary for us to take in hand the preparation of The British Journal Photographic Almanac for 1897. A feature of the volume for the past thirty years has been the co-operation of numerous friends and readers of the Journal, and the Editor takes the opportunity to express the hope that the support so kindly placed at the disposal of his predecessors may be continued to him.

We especially invite contributions on topics of practical interest, and should feel obliged if the articles and any accompanying sketches are sent to us at the earliest possible date.

Secretaries of Societies, and especially of those established since the appearance of the last Almanac, will oblige us by forwarding lists of officers and other details for inclusion in the Directory of Photographic Societies, in order that the list may be made as complete as possible.

The Publishers wish us to remind intending advertisers that the announcement pages of the Almanac are already filling rapidly, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

Mr. J. E. Shaw, the well-known Huddersfield photographer, is the latest contributor to the "coupon" literature with which we have been enabled, for some weeks, to edify our readers. Mr. Shaw forwards us copies of the correspondence between himself and the firm of diarists. He very naturally takes the same line as the other photographers who have addressed us on the subject, and who have been properly concerned to know wherein the advantage will lie of being advertised to take photographs for nothing. Parts of the replies of the firm of diarists to Mr. Shaw are worth quoting. "Advertising the taking of photographs for nothing," they say, "is no different to advertising that you will send a sample of cocoa, pills, or soap, &c., free, and that is the way fortunes are made!"

* * *

The following, we suppose, is intended to touch the national pride of the British photographer, and goad him into making a fortune: "In Paris the best photographers adopt this system" (*i.e.*, take photographs for nothing), "but then the French excel us in advertising, finance, and photography." We require higher authority before accepting such statements. The firm add further that they are "literally inundated with applications from the *very first* (*sic*) photographers throughout Great Britain, and the only difficulty will be to make a selection!" "Evidently you" (Mr. Shaw) "have no enterprise," &c.

* * *

We need make no further extracts from a correspondence which is full of material for amusement; and, in concluding our references to the matter, we do so by reiterating the observation, that the scheme proposed cannot strike any disinterested person as calculated to be profitable or advantageous to photographers. We do not think the profession at large will support movements whereby the public is led to believe that photographers have adopted the system of taking photographs for nothing on the chance of subsequent orders being obtained, and we are decidedly of opinion that those photographers who lend their names to such proceedings deserve the reprobation of their fellow-professionals.

* * *

We gather from the *Camera Club Journal* that the session 1896–97 promises to be very successful as regards the papers and lectures that are to be delivered before the members.

Promises have been obtained from such men as Captain Abney, Dr. Tilden, Mr. Storey, A.R.A., Dr. Lindsay Johnson, Mr. F. E. Ives, Professor Boys, Professor Roberts-Austin, and others, so that a programme of much diversity and value appears probable. The "Whip Fund" of the Club now nearly amounts to the sum asked for by the Committee, viz., 800*l.*, and it appears to be felt that the future of the Club is "not without hope."

* * *

The Annual Meeting of the National Association of Professional Photographers will be held at Anderton's Hotel, Fleet-street, London, E.C., on Monday, September 28. The President (Mr. W. Barry, of Hull) will take the chair at four o'clock. The agenda are as follows: To receive a report from the Secretary; to fix date and place for summer excursion, 1897; to consider a suggestion as to the Association being conducted on social lines. The annual dinner will take place the same evening at seven o'clock; tickets, 3*s.* each, of the Secretary, D. J. O'Neill, 47, Charlotte-road, Birmingham.

* * *

Mr. R. P. Drage, the Honorary Secretary of the Photographic Convention of the United Kingdom, asks us to state that, during the continuance of the Royal Photographic Society's Exhibition, one of the Lantern evenings will be devoted to a display of slides made from negatives taken by members during the Convention week, illustrative of the scenes then visited. It is to be hoped that Conventioners who took photographs at Bolton Abbey, Fountains, and York, will endeavour to make slides from them and help to make an interesting exhibition on the night in question.

THE POISONS ACT.

We have been asked by a correspondent, a dealer, to state what poisons are scheduled by the Poisons Act, which only pharmaceutical chemists, under certain conditions, may sell to the public. The following is the schedule: Part 1. Arsenic and its preparations, prussic acid, cyanide of potassium and all metallic cyanides, strychnine and all poisonous vegetable alkaloids and their salts, aconite and its preparations, emetic tartar, corrosive sublimate, cantharides, savin and its oil, ergot of rye and its preparations. Part 2. Oxalic acid, chloroform, belladonna and its preparations, essential oil of almonds (unless deprived of its prussic acid), opium and all preparations of opium or of poppies.

The Act, in its very first sentence, recites the "safety of the public" as its reason for giving the Pharmaceutical Society control over those who retail or dispense the poisons scheduled, and therefore we must suppose that the Legislature, in its wisdom, backed up by the Pharmaceutical Society, discerns no menace to the safety of the public in the indiscriminate sale of silver nitrate, bichromate of potash, pyrogallol, the caustic alkalies, sugar of lead, and the mineral acids, most of which have on occasion played the dismal *rôle* of abbreviating human life. The Act, therefore, is a failure, and defeats its own object of restricting the sale of "poisons" by a privileged few.

The Poisons Act stands in need of amendment, not only in the respect pointed out, but in that of including others besides pharmaceutical chemists within its scope. It must strike everybody as ridiculous that a photographic dealer may sell one poison with impunity, and run the risk of prosecution for retailing another. It is equally absurd that, if a small quantity of a scheduled poison is wanted for commercial or scientific purposes, some method other than that of compelling the vendor to be a pharmaceutical chemist—for that is what it amounts to—could not be adopted for rendering it available. It appears to us that photographic dealers, and suchlike, might, as in the analogous case of the retailing of the "old" methylated spirit, be granted permission to sell small quantities of the poisons used by photographers, provided a register be kept, signatures be taken, and other safeguards adopted. At any rate, the continuance of the Pharmaceutical Society's system of entrapping offenders for doing with the right hand what they may pass unscathed for if they do it with the left is an outrage on common sense.

We have frequently raised the ire of many of our correspondents and some of our chemical and drug contemporaries by stigmatising the Pharmaceutical Society as a trades union. A copy of the Poisons Act is before us as we write, and the whole tenour of that remarkable statute is unmistakably to invest the profession of pharmacy with a monopoly: that of the sale of poisons. The Society grants certificates of skill, and it prosecutes those who infringe the privileges of its members; allows the widow of a deceased chemist to carry on the business provided she employs one of its members; and it has a benevolent fund for the widows and orphans of deceased members. Apparently it is not only a trades union, but a benefit society. We shall be convinced that the Pharmaceutical Society has the safety of the public at heart when the Act it administers is so amended as to be drawn less in the interests of pharmaceutical chemists and more in that of the public.

Glow-worm Light.—At a recent *séance* of the Paris Academy of Science it was stated that the light emitted by glow-worms was found to be able to penetrate black paper, and affect a dry plate folded in it.

Dangers of Celluloid.—As our readers are well aware, a number of large gooseberry type of paragraphs referring to celluloid explosions went the rounds of the papers some year or two ago, and, as a consequence, a reaction set in; but it must be well borne in mind that there is a real danger in the material under certain circumstances, for, under particular conditions, it is quite capable of becoming powerfully explosive. Further, as a reviewer in *Nature* recently remarked, "celluloid shavings should never be allowed to accumulate, as they take fire easily, at a comparatively low temperature, and in this state burn with surprising rapidity."

The Art Union.—The copyright in the picture, by Mr. E. A. Abbey, A.R.A., *Richard Duke of Gloucester and the Lady Anne*, which was shown at the last Exhibition of the Royal Academy, has been secured by the Art Union of London. The work is to be reproduced as an etching by M. Leopold Flameng, and will be a presentation print. Several of the presentation plates of the Art Union of late years have been etchings. Formerly they were line, mezzotint, or mixed style, but photogravure seems to have sent those styles of work quite out of the field; indeed, there are now no really good workers of the old school of engraving to be obtained now, or, doubtless, the Art Union would avail itself of them. The old hands have died off, and there are no new ones to take their places.

Photographic Apparatus.—In a shop window, not very far from Charing Cross, there is an announcement of a clearance sale of the photographic stock at great reductions. Here are examples. Shilling cameras are quoted at ninepence; two-and-six-

penny ones at two shillings; three-and-sixpenny ones, two and ninepence; and five-and-sixpenny—the most costly, we think—at four and three. Eighteen-penny stands are one and twopence, while shilling dark slides are sacrificed for ninepence each. Who, in face of these prices, can complain of the costliness of photographic apparatus? However, perhaps the expenditure of a shilling or two of a lad's pocket money may hereafter develop the latent talent, now in embryo, of a great photographer. We have known the purchase of "a guinea set" being the means of the evolution of more than one amateur photographer, who has afterwards distinguished himself, though with a superior class of apparatus, it is true; but the cheap outfit must be credited with creating the taste for the art.

Photographing Electric Discharges.—It is reported from Turin that M. Rhigi has been successful in "producing and photographing globular lightning." As the experimentalist is stated to have produced the lightning, we presume this is a laboratory experiment only, yet it may prove that this form of electrical discharge has existence. It has always been a doubtful matter amongst scientists as to whether there are globular forms of lightning. Meteorologists are very anxious to obtain photographs of lightning, and have at times appealed to photographers to secure them for them. Photographs of lightning can only be successfully obtained after dark. Photographers are, as a rule, not sufficiently weatherwise to foretell when a storm at night is to be expected, and the daily forecasts, as issued by the Meteorological Office, such as "possibly thunder," &c., are not sufficiently reliable to induce photographers to keep out of bed on the doubtful chance of the forecast being fulfilled. If the weather forecasts were more trustworthy than they are, they would be a great boon to photographers.

Poisoning by Pyrogallic Acid.—One day last week the Coroner for East Sussex held an inquest on the body of a lady who was accidentally poisoned. It appears that the husband, a doctor and an amateur photographer, had left some chemicals on a sideboard where the lady also kept her medicine, and in the dark she took up the wrong bottle. It contained a solution of pyrogallic acid, some of which she drank. She became ill, and died some days afterwards. It is not stated what was the strength of the solution, or the quantity swallowed. This would have been interesting to know, as this is the first case we remember of fatal poisoning with pyro, although it is known to be a poison. Either a very small quantity was taken, or it must be very slow in its action, for it is stated that the poison was swallowed on the Friday, and death did not result till the Tuesday following. The case should serve as a warning to amateur photographers not to leave their chemicals where they may possibly be mistaken for other things. All developing agents may be classed as poisons, though some are more potent than others.

Fatal Benzole Vapour Explosion.—While some boys, at Hull, one day last week, were playing with some empty benzole drums, one of them exploded, killing one lady, and seriously injuring another who happened to be passing at the time. It is said that one of the lads struck a match and applied it to the drum, when the mixed benzole vapour and air within exploded. Volatile liquids, such as ether, benzole, alcohol, &c., the vapour of which, when mixed with a certain proportion of air from explosive compounds, are not so much used in photography as they were in the collodion days. Still it is well to allude to the danger there is with them under certain conditions. For example, if in a bottle from which methylated spirit has been drained a certain proportion of air is introduced, and allowed to mix with the alcoholic vapour, a highly explosive mixture is formed. We, some years ago, were told by an *employé* at one of the London distilleries of a verdant, young, and over-officious exciseman, who a few days before, would insist upon seeing into an empty spirit cask with a lighted taper. The result surprised him. He was blown some distance, though not seriously hurt; but, as our informant said, he received such a lesson that he was not likely to again pry into empty spirit casks with a lighted taper.

Keeping Power of Plates.—*Apropos* of the keeping power of plates, we have lately met with two very contradictory experiences. Having occasion to wait at a roadside station some little time when on a photographic tour, the station-master entered into conversation with us and a brother artist. He brought out a negative taken on an Ilford plate that was one of their very earliest make, and had been kept two years after exposure before developing, yet the negative was technically perfect, free from spot, stain, or fog—surface or otherwise. The other instance we refer to was just the opposite. The packet of plates had only been opened immediately before use, and had been stored in a cool, dry cupboard, but, when they came to be developed, were almost entirely covered with a dense metallic fog. The angry owner was about to write a scathing letter to the makers, when, just in time to prevent it, he discovered a large hole on the back of his cupboard, which opened directly upon the sink, down which he poured all his waste hypo after precipitating with liver of sulphur! The sulphuretted hydrogen evolved was enough to spoil any plate unless soldered up in a metallic case. The moral is obvious.

Herr Andrée's Balloon.—Some time ago, when the geographical world was in a state of excitement over Herr Andrée's projected balloon trip to the Pole, we detailed some portions of the arrangements, referring to the large number—reckoned by thousands—of dry plates that had been taken aboard. Unfortunately, Fate, as typified by the wind, was not propitious; the balloon did not start, and the plates remain unused. The manufacture and method of packing of these necessary adjuncts to photographic practice has been brought to such a pitch of excellence, that Herr Andrée's store, if kept, should be quite fit for use when he starts next year; but, as a matter of precaution, it would be most desirable that a few packets of plates should be taken at random and tested some little time before he starts, as it would be a thousand pities if, after the daring aeronaut reached his goal and had been able to make a series of exposures, and, further, return in safety with them, he should find them useless. There is every probability that he will start, for the balloon proved to be impervious to the atmosphere after three weeks' exposure in the open air; and all the apparatus for filling, &c., is left intact at Spitzbergen, awaiting his return in July next year, which is the date decided upon.

More Railway Concessions Wanted.—It appears that cyclists are still, as they have been for some time past, agitating for some concessions from the railway companies in the matter of fares, or, rather, charges. When the charges for their travelling are considered, one must at once admit that there are very much better grounds for the concessions asked for than there is for the reduction of fares asked for by photographers, or those already granted to anglers. An ordinary third-class passenger is allowed to take half a hundredweight of luggage, which can be stowed in the luggage van free of charge; but a cyclist, although he has no other luggage, has to pay extra for his cycle, and the tariff for that is, in some instances, nearly as much as, sometimes more than, the fare for himself, yet the cycle may not weigh more than half the weight of other luggage he would be entitled to have conveyed free, and not take up more space. All the cyclist asks is that he or she may take the machines free of charge, as they are entitled to do with other luggage, and not any reduction of fares, such as photographers have asked for and anglers have obtained. By the way, what has been the result of the circulation of the petition forms that were sent to the majority of the photographic societies for signature early in the year, asking the railway companies to make a reduction in the fares to photographers?

Ascertaining the Strength of Coloured Light.—The difficulty of comparing the strength or visual intensity of coloured light as against an ordinary standard candle or amyl-acetate lamp is well known, but Mr. Frank P. Whitman, taking advantage of Professor Rood's investigations on such subjects, has devised an apparatus by which such estimations may be made as correctly as with monochromatic lights of different intensities. Professor Rood

made fifty discs of all gradations from black to white, and, when amalgamating pairs of them in a whirling machine, noticed that, when the two greys were much removed in depth, a sort of flickering was produced, an appearance which became less and less as the greys more nearly approached each other in depth of shade. When a colour was paired with a grey, an almost similar effect was obtained. Mr. Whitman uses a white card with the colour to be tested, and exposes the two in rapid alternation to the experimenter's eye. The cards are illuminated by lights of different intensities at opposite ends of a photometer bar, and, by moving the card supports to and fro till the flicker ceases, it is assumed that their relative luminosities are equal; a simple calculation then suffices to give all the *data* necessary for reference at any future time. It need scarcely be said that coloured lights could be compared equally well.

Points for Discussion in Röntgen Work.—Dr. Macintyre, who has done some remarkable work in photographing the whole of the human body by the Röntgen rays, has an article in last week's *Nature* pregnant with important information and hints. We refer our readers who have taken up the work to the original paper,* contenting ourselves with giving a few extracts. Referring to the large amount of current found necessary, he says: "The question will naturally here suggest itself to those familiar with the subject, Is it necessary to use such currents, or could we not do with less energy by economising the force in the transformers and vacuum tube? The question is a very proper one, as all experimenters know that some tubes will give better results than others with a certain amount of force passed through a particular apparatus."

"It may here be pointed out that, in using fluorescent screens for the deeper structures of the body, barium platino-cyanide in some instances gives a better result, or a darker shadow, than the potassium salt. I am quite aware of the fact that the potassium is more luminous, and it may be that it is a particular construction of the screen, or the particular specimen employed, because samples of these salts vary in their effects. After using a large number of different materials, I, like others, have fallen back upon the potassium or barium salts, but employ both. The barium has the advantage of being a good agent, well suited for hospital purposes, and durable." Further, when using the screen alone, he finds a darkened room much better than any form of cryptoscope.

JOTTINGS.

Newquay, hail, all hail, you fair and brilliant gem of the Cornish coast! The eyes of Europe are upon you, for the discoverer of photography in natural colours, Mr. John Wallace Bennetto, has his abode in your midst. The problem that has defied solution for half a century—that has almost fruitlessly engaged the attention of some of the profoundest men of science the world has seen—that has taken rank in difficulty of attainment with the transmutation of the baser metals into gold—this mighty secret has been discovered by one of your townsmen, who, to all appearances, recks not what the world beyond his own surroundings may say or think of him, and is apparently all unconscious of the fact that, by reason of his achievement, the humble village of Newquay may one day be reverently pointed out as the Nazareth—maybe the Mecca—of Photographic Science!

The astounding and gratifying result of seven years' patient toil in experimental colour photography has not turned Mr. Bennetto's head, as it would have done those of most men, for, with the indifference that is an unmistakable sign of confidence, he appears to be in no hurry to claim the material rewards of his success. Most of us, I fear, would at once have hastened to London, and laid our results before the Queen, the Royal Society, and the world—having previously taken out provisional protection, by the way. The newspapers would thereupon have boomed us, a syndicate would have been formed, a company floated, and the fortunate discoverer would have netted a handsome pile in no time.

Is it only in such far-off unsophisticated places as Newquay that science is looked upon as its own reward? Mr. Bennetto may be a conspicuous exception to the general rule for Daguerre received a handsome sum from the French Government; Dr. Joly is reputed to have sold his colour-screen process to an American syndicate for 6000*l.*; Lippmann, a year ago, got a money award from a Paris society; and Mr. Fred. Ives, after many years' work with the three-colour process, is, I hope, on the verge of turning it to profitable account; so why should not Mr. Bennetto also, as the sporting men say, "stand in?" However, all this, and more, may follow the public exhibition of Mr. Bennetto's results that is shortly to be given at Newquay. What must it be to be there!

I observe an editorial condemnation of the practice of vending and buying secret photographic processes, which, to say the least of it, is not ill-timed, as the secret process-monger is once more raising his head among us. It was only the other day that a bland and plausible rascal robbed several photographers in the north—fancy, in the "canny" north!—of guineas and half-guineas galore by pretending to sell them a secret mixture, alleged to possess remarkable orthochromatising properties. The thing was an imposture. A more subtle person was one of whom I obtained cognisance some years ago. This knight of industry travelled the country with a developer alleged to have been worked out by a well-known firm, and said by him to have the property of enabling exposures to be very materially shortened. It transpired that he used just an ordinary pyro-soda developer, *plus* a caustic alkali; but, for all that, he managed to ensnare quite a large number of victims. Of secret processes it may generally, but safely, be said that they are either old and well-known ideas, or worthless ones, and photographers can therefore lose nothing by not encouraging the traffic.

The agitation that has been directed against the publishers of an annual volume for inviting photographers to allow their names to be printed as agreeable to take photographs for nothing, or on "spec," as Sam Weller accused Messrs. Dodson & Fogg, the eminent solicitors, of taking up cases, is only what might have been expected. A fitting punishment for those photographers, if any, who are so poor-spirited as to countenance this sort of thing, would be to publish their names as a kind of "black list" for the contemplation and contempt of their brethren. May I suggest that the National Association of Professional Photographers should interest itself in the matter?

The continued anger of the pharmaceutical chemists at my (and others') remarks on the action of the Pharmaceutical Society in prosecuting photographic dealers for "offences" which it was surely never contemplated by Parliament they should be prosecuted for, is the best evidence that the photographic trade has not been justly dealt with. Mr. Pike, in reference to my suggestion that chemists often overstep the mark in prescribing virtually throws the onus for this practice on those who go to chemists for something to cure a cough or cold. This no more legalises the action of the chemists in prescribing than does the act of a photographer in asking a photographic dealer for an ounce of mercuric chloride legalise the complacence of that dealer in acceding to the request. But, if the chemist is permitted to go scot free, why not the photographic dealer? Therein lies the whole point of the matter—what is sauce for the goose is not sauce for the gander. As regards Mr. Hampson's somewhat intemperate outburst of last week, I have only to echo and agree with his remark that "what a godsend it is that there is one time during the year when we can grind out twaddle—and get it printed, too—and generally write without rhyme or reason!" It relieves the liver as much as would a one-shilling-and-three-halfpenny box of pills.

* Vol. liv., No. 1402, p. 451 *et seq.*

I am waiting to hear the annual howl of dissatisfaction arise at the awards of the Judges at the Royal Photographic Society's Exhibition. The outside artist element on this year's jury is stronger than heretofore, so that the chances of some curiosities of judicial opinion are proportionately increased. Not more than a handful of members of the Royal Photographic Society are smitten with the queer desire to have the Exhibition "judged" by a number of R.A.'d and A.R.A.'d gentlemen, who, as a rule, are entirely ignorant of photography and its limitations, and a protest is therefore called for against this same half-dozen members being allowed to annually attract ridicule to the Exhibition. Before me, as I write, is last year's illustrated catalogue, and, as I turn over its pages, I see at least one reproduction, the original of which obtained a medal that only an artist could have awarded, and that set us all wondering and laughing in each other's faces twelve months ago. I hope Messrs. Leader, Storey, and Wyllie will not give us away *this* year, but I am filled with apprehension that they may. COSMOS.

PAINTERS AS JUDGES AT PHOTOGRAPHIC EXHIBITIONS.

THE practice has been in vogue at certain photographic exhibitions of inviting painters to act as Judges in deciding upon the merits of the work sent in, either for the purpose of crowning with honour some selected exhibits or, as is the case at Paris, of acting as a selecting committee.

It is worth while to inquire whether there are, at the present day, any reasonable grounds for a proceeding which, at first sight at least, appears to be a confession of extreme weakness on the part of the professors of the art whose productions the public is invited to admire.

By the term painters is, of course, meant those who are painters only, and who have no pretensions to be photographers, least of all pictorial photographers.

Photography is a comparatively new method of graphic delineation, but it has had time to acquire a status of its own, and it is a humiliating admission to make that it has amongst its leading exponents none, or not sufficient men to decide upon what is and what is not of value in their own art. And, if a knowledge of, and training in, other practical branches be an advantage, does it not possess these also in its ranks, for it is certain that very many of our leading pictorial photographers are, at the same time, very capable painters or draughtsmen? Where, then, is the need of flying for advice to the professors of another system?

To put a similar case, what would be thought of the eminent men at the head of electrical science if they were obliged to call in experts in railway engineering, for example, to decide upon the merits of their own delicate instruments, or if microscopists were asked to adjudicate upon the triumphs of scientific photography?

The complacency with which the system has been accepted is certainly surprising when one considers how terrible a confession of weakness it involves. It would seem at once to dispose of the question (in the minds of those who are responsible for the practice) that there is any art in photography. We would appear to be landed on the horns of a dilemma. To admit that there are no artists amongst the body of photographers capable themselves of judging without assistance the productions of their craft is surely to admit that there can be no art in the productions themselves. On the other hand, if it is not art which is to be judged, why are artist painters called in to adjudicate?

The problem is one which is rendered all the more difficult to solve from the fact that we are in ignorance, or at least in extreme doubt, concerning the principles upon which these painters base their decisions. Are we to understand that they admit the art in photography and, if not, on what other grounds do they claim to be experts? And the question is still further complicated when, in addition, sets of lantern slides are submitted to them for the award of a medal. For art? It is difficult to be serious in applying the term to these very mechanical and easily made transparencies. If, on the other hand, they do not deign to examine carefully these little sets of reproductions, but hand them over to some other section of the organization, one wonders still more what great scientific merit there can be in them to justify, year by year, the bestowal of the medal of a learned society.

An important consideration in the matter is that experience has shown us that painters, with the exception of those who may be termed *converted*, base their judgment of the value of a photograph more upon the suggestive use it may have for them in their own art than upon the artistic qualities which it may itself possess. More than this, they look for excellencies in it which science, and not art, is responsible for; qualities which they themselves would condemn in painting excite in photography their wonder and admiration. This is, of course, all very well, and no one can quarrel with a feeling consistent with a negation of art in photography. But the very fact of their selection as Judges presupposes the opposite opinion. Upon what other grounds is it assumed that, because certain Royal Academicians are painters of some repute, and qualified perhaps to judge of all schools of painting, they are therefore competent to appraise the merits of the inartistic photograph?

But perhaps the most convincing proof of the worthlessness of the system is to be found in its results, for which we need not go back many years. At Paris, this year, the selecting committee, composed entirely of painters, sculptors, and engravers, passed some seven hundred frames. Of this number, one-third at least, if not one-half, would nowadays be rejected at the Dudley or at Pall Mall, for they do not even stick at huge enlargements with pure white skies. Would the smallest provincial society have been more criminally lenient? And where is the great advantage derived from the counsel of these gentlemen, unless, indeed, our own judgment of an art, in which we are supposed to have had some training and experience, is wrong, and that we ought humbly to admire that which, unaided, we should cast aside with scorn? The extraordinary decisions at recent exhibitions have also, year by year, excited wonder and derision. I think even "Cosmos," of this JOURNAL, will support these sentiments. It could scarcely be expected, however, that, on mixed juries, the photographic section should not, now and again, defer to the predilections of their distinguished colleagues of the Academy. Surely it must have been such sentiments of graceful deference which have allowed the medalling of snap-shots of smoking steamers which the rawest practitioner with a Kodak could easily accomplish, and of other exhibits whose merits as photographs or pictures have been somewhat less than apparent.

Whatever theoretical possibilities, then, may be brought forward in favour of a custom which certainly is inconsistent with dignity, the question may fairly be asked, What practical advantage has in any one case been derived from it? I have already shown in previous communications to the photographic press that the whole system of medals at pictorial exhibitions, and especially at photographic ones, is anomalous. The fact that there is, nowadays, practically no competition, except amongst the second and third rates, is obvious, and is of itself a sufficiently cogent reason against the practice, so far as photographic art is concerned. Speaking more generally, it may be valuable to recall a saying of the late Sir John Millais. He said: "There is no comparison in art. You cannot compare works of art any more than you can compare flowers. You may prefer a rose to a lily, but you do not say one is better than another;" which is, after all, perhaps only an application of the household word which has pronounced comparisons to be odious. ALFRED MASKELL.

ON THINGS IN GENERAL.

THERE is much food for thought when a recent leading article in these pages is read in concert with the article upon the Photographic Copyright Union. It is enough to make any professional photographer's mouth water to read of orders by the thousand, for, so far as I can gather, the "quarter of a dozen" order is more the usual thing, and not good at that, for I am told that, if so large an order is given, it is usually on the "on sale or return" principle. A well-known provincial photographer told me the other day of a series of orders he had received amounting to over a hundred copies of a large group, and, after twelve months waiting to be paid, he had the

bulk returned to him unsold. On referring to the various orders received he found they were so dexterously worded as to afford a fair defence if the case went into court. Moral: If you are lucky enough to get more than a "quarter of a dozen" order, see that "on approval" cannot be read between the lines. But this is rather wandering from copyright questions. There is not a shadow of a doubt that the illustrated papers have killed the trade in celebrities. Any photographers of note whose names were "familiar as household words" a decade ago will repeat the same story, "There is no call for celebrities now." Quite recently I was talking to a dealer who is so situated that he would be naturally applied to by any one desiring to purchase portraits of a certain celebrated popular character. "Look here and look here," he said, taking out of drawer after drawer whole bundles of what were once a saleable type of portrait, "I can't sell one of them. When Americans call and I show them, they at once say, 'Oh, that came out in my paper!'" The reasonable deduction from this is that the papers who have stopped the sale are morally bound to pay for the use of the photographs that help to make their papers pay; and, with the exception of a few black sheep, they will pay not only the trumpery half-guinea, which seems to be such a stumbling-block to so many, but a goodly number of half-guineas if the subject is worth it. They are not all worth it! Hence it would seem to be the natural sequence of events that all photographers should join this Union. If a photograph is worthy of being repeated in the pages of an illustrated paper, it is worth paying half a guinea for. As to the proud privilege of seeing one's name in print and counting it as a good advertisement, well, the man must be very innocent who can attach any value to such an idea. There is a reverse side to this medal. There are so many photographs of the most wretched and inartistic character used (gratis ones by our friends the innocents?), that the whole character of journalistic illustration is being gradually degraded, notwithstanding the high pitch of skill to which process workers have attained.

Speaking of process blocks leads one to recall some of the remarks at a recent meeting of the London and Provincial Photographic Association, when Mr. Beckett is reported as having said that the "blocks were not so much to blame as the printing." He put the whole matter in a nutshell. One cause for the Americans excelling us in this kind of work is the skill with which their printers make the block, the ink, and the printing part and parcel of each other. Take the weekly journals of this country, and what do we see? Good prints from process blocks the exception rather than the rule. There is one paper whose results are nearly always superb; there is another whose blocks have the same imprints, but whose illustrations are beneath criticism; there are all grades between.

A correspondent—"Plates"—writes to the JOURNAL to ask a lot of questions that a little common sense brought into play would have rendered unnecessary. First, he receives some plates damaged, and does not write to the sender about them till several days have elapsed. It is exceedingly improbable that, if the latter would entertain such a claim at all, he would do so if not informed of damage per return. Next, he complains that the railway company will not compensate him, because the box was not marked "Glass." Surely he must see that glass goods need more care than hardware, for example; and if the company be not informed that a parcel contains glass, they will not take special care. When such special care is taken, it is charged for extra. Then, again, there is a further extra charge if the company take the risk; as, if the goods are sent at the reduced rate of "owner's risk," they will not pay for damaged contents, unless there be visible external marks pointing to careless treatment. If "Plates" carries out his threat of fighting out the County Court proceedings, he will gain some experience as to the best mode of dispatching cases of dry plates and the like. The cost to him of obtaining that valuable information will be the County Court fees of himself and the company, solicitors' fees ditto, witnesses' ditto. This expenditure will, no doubt, help to fix these useful pieces of information upon his mind, just as in olden times the boundaries of a parish were fixed on the minds of youngsters by the violent application of a bunch of twigs from a birch tree to his *glutei maxima*—the smart pecuniary and the smart corporal.

I wonder what "Scrutator" had in his mind's eye when he put that question about fallacious papers to the Editor? It is, without doubt, the rule, expressed or implied, that papers, before being read at meetings, should be examined by some one in authority; but it is also without doubt that, if the rule were enforced, a large number of societies in the country would have to close their doors for ever if they shut them against the twaddle-mongers. Besides, if only papers of value were to be read, what would become of the secretaries, what of the photographic journals who print the twaddle?

"Give the man a chance," quotes Mr. H. P. Robinson, after the famous *bon mot* of the Leeds Convention Group. It deserves to be written in letters of gold, for it describes the situation to a nicety. Who is there who has not experienced the misery of group-taking, and has not been inclined to empty the chambers of a six-shooter promiscuously among the witlings who cause the tittering that will not be allayed, or the embryo teachers who call out all sorts of advice from every direction in the group? I am naturally a humane man, but I should most willingly consent for one of the number to be flayed alive as an awful warning.

In a recent leading article a reference was made to the possibility of hypo not being pure, though, of three samples examined, the Editor found an impurity of less than one per cent. That is a good enough record, though it is true that the makers of one well-known brand guarantee that it contains 99·7 per cent. of hypo. Mr. Pringle, being asked by "Alpha" the strength the fixing bath should be made at, gives for P.O.P. one part of hypo in seven or eight of water, and with a fifteen minutes' fixing. There is no doubt that the time given is a safe one, but I think it errs on the side of safety. A print is apparently fixed in less than two minutes, provided a dishful of prints gets well moved to avoid contact. I should think six or seven minutes ample, for over-fixing lessens brilliancy. My custom is to give four for collodio-chloride, and a little more for gelatino-chloride, and not put too many prints together. FREE LANCE.

ORTHOCHROMATIC COLLODION EMULSION.

AN article two or three weeks back, by Mr. A. D. Pretzl, on *Orthochromatic Collodion Emulsion for Process Work*, calls attention to a matter that deserves far more attention than it receives at the hands of photographers generally, even those who are in the habit of using collodion regularly. I allude to the far greater facilities in the direction of colour sensitising that collodion offers as compared with gelatine. I think it was Dr. Vogel who some years ago pointed out how much greater an increase of sensitiveness to yellow was obtainable with stained collodion film than with similarly treated gelatine; and, though the remarks referred, if I remember rightly, to bath plates, in which the dye would, of course, be subjected to the action of a large excess of free silver, still the same advantage is offered in a modified form by stained emulsion containing no such excess.

But in the case of collodion emulsion the advantage to be derived from the practice of colour sensitising is not confined to orthochromatic work, as it is termed, that is, the correct rendering of colour values, but it becomes a direct means of increasing the sensitiveness, at least under some conditions, if not under all. The comparative inferiority of dry-collodion plates when pitted against gelatine or even wet-collodion is due to their relative insensitiveness to the green, yellow, and red rays, and to weak light generally. If, therefore, we can increase the sensitiveness to those rays, without unduly decreasing it to the violet and blue, a distinct advantage must be gained. It was, I think, Mr. J. B. B. Wellington who first utilised this accelerating action in connexion with collodion emulsion, and, though it is now some years since his formula and method were published, very little further advantage has been taken of the principle.

The idea of staining collodion films with a view of rendering them more sensitive to special rays is far from being new, and antedates orthochromatic photography by many years. Carey Lea and others nearly thirty years ago advocated stained films for landscape work, and, though the primary object was rather the prevention of halation, one of the advantages claimed was a better rendering of foliage and coloured objects generally. But, in those early days, the use of stained films was accompanied by a serious loss of general sensitive-

ness and never secured very general adoption, possibly on account of the employment of unsuitable dyes; Carey Lea used litmus, and aurine and chrysoidine were also pressed into service, but none of them seem to be of any value at the present day. On the other hand, with the introduction of eosine into the collodion film by Colonel Waterhouse, the practice of colour sensitising may be said to have taken practical form.

It is generally supposed that in rendering a film orthochromatic, or sensitising, if for any particular set of rays, its general sensitiveness is reduced even without the use of a yellow screen; but, though this may be the case with gelatine, it is certainly not necessarily so with collodion. Indeed, I have carefully compared two samples of the same emulsion, stained and unstained, and even in bright summer light at midday have been unable to detect any difference, at least in the way of falling off, on the part of the stained sample. But, when the same two samples are compared under conditions which bring the colour sensitiveness into action, as for instance on a dull day, or late in the afternoon, a distinct advantage can be claimed for the stained emulsion. Here I am speaking of colour sensitising in its simplest and crudest form, the mere staining of the emulsion by the addition of colouring matter after the sensitive salt has been formed; but, if provision be made for the combination of the dye with the sensitive material, the beneficial effect is correspondingly increased.

This being the case, it would seem to be the proper course for every user of collodion emulsion to resort to colour sensitising, as by that means he directly increases its sensitiveness under those conditions when the increase is most desirable. Thus, in the case of lantern-slide work, most of which, whether by day or artificial light, is done in the winter months, the advantage will be specially noticeable, and exposures, either in the camera or by contact, will be very materially shortened by using stained emulsion, and still more so with one properly orthochromatised. I have heard of collodion emulsion plates being exposed all day in the camera for the production of a lantern slide, and, though the exposure seems inordinately long, I have not the least doubt as to the accuracy of the statement. Yet with an orthochromatic emulsion there is no difficulty in getting a fully exposed slide by reduction, with a minute, or, at most, two minutes', exposure on an ordinary clear winter day. With artificial light the advantage is equally, if not more, marked, and thus, whether by contact or in the camera, the use of stained emulsion is beneficial.

The only question that remains is whether any counterbalancing demerits accompany the increase of sensitiveness. The first point to be examined is the keeping quality of the emulsion when colour-sensitised, and this will naturally vary with the method adopted. It is usually said that orthochromatic plates or films are not to be relied on after a certain age, and, while I am not prepared to agree that this is *necessarily* the case, it is an undoubted fact that some of them are not. This, however, is rather the fault of the method than of the principle. So far as my own experience goes, the simple staining of the emulsion with eosine, erythrosine, and turmeric is absolutely harmless so far as the keeping qualities are concerned, and, though the advantage accruing under such conditions is not great, it is still noticeable. When chlorophyl is employed, I am inclined to think there is a decided element of uncertainty introduced, for I have found such emulsions become decidedly foggy after a time, and, even when that does not occur, the beneficial action of the chlorophyl soon passes away.

When the colouring matter is added to the emulsion in combination with ammonia or other matter tending to help it to combine with the silver bromide, I think there is always a certainty of the ultimate failure of the preparation, unless the emulsion be washed. And there lies the whole secret of success or otherwise on the keeping of orthochromatic films. If the combination takes place directly between the dye and the silver salt, all excess of the former must be rigorously removed, or the ultimate decomposition of the sensitive material is certain. Perhaps where the maximum of effect is derived it is better therefore to treat the films separately, rather than to operate upon the bulk of emulsion.

On the question of whether orthochromatised collodion films are more difficult to handle than ordinary ones, I think it may be said that no trouble will be experienced. Bearing in mind that they are far less sensitive than ordinary gelatine plates, it may be accepted that, with ordinary care, the same treatment that will do for one will do for the other. Of course, if the attempt be made to work colour-sensitive films in a light that will barely be safe with wet collodion, the operator must expect to suffer; but I imagine nowadays most workers are inclined to err on the side of safety, rather than the reverse.

From every point of view I am inclined to think that, for all ordinary winter work, it will be found advantageous to adopt the practice of colour-sensitising collodion emulsions.

W. B. Bolton.

RETAILING POISONS.

Much correspondence has recently taken place as to the unfairness of chemists and druggists having a monopoly of retailing certain dangerous poisons. It seems to me that the case is argued from quite a wrong standpoint. In the first place, why was an Act passed at all securing the monopoly to presumably qualified dealers? It most certainly was not with the idea of giving any *commercial* advantage to the druggist, as the trouble of complying with the Act, and the small money values disposed of by any individual druggist quite negative that idea. It was simply because of the ease with which the public could obtain poisons for nefarious purposes from utterly irresponsible people, and the carelessness with which such dangerous substance were sold and used. Flour, arsenic, whiting, sugar, &c., were frequently sold out of barrels and drawers in the same shop, and placed in close propinquity to each other without any labels or distinguishing mark whatever. A child might go into a shop for a "penn'orth of arsenic for killing mice," and get it as readily as a pound of sugar. Arsenic in agricultural districts is freely used for sheep dips and other purposes, and in many places kept ready in parcels, and then arsenic was little more than a synonym for poison with thousands of people. One confectioner at Bradford put arsenic instead of plaster of Paris into his peppermint lozenges, sold them freely on a market day, and poisoned numbers of people. Then the Legislature stepped in and framed a law to restrict the sale of arsenic and certain other dangerous poisons by only persons presumably better qualified to exercise care in their distribution.

The wisdom of the Act was soon apparent by the great diminution of deaths from poison. One can scarcely take up a daily paper now without reading of deaths by suicide or misadventure by carbolic acid, a poison sold indiscriminately by irresponsible dealers. Why this also was not added to the schedule was *possibly* because of its extended use and value as an antiseptic, the monopoly of which would undoubtedly cause considerable inconvenience, as well as creating pecuniary advantages that would be unfair, which can scarcely be said of the few chemicals used in photography, if the greatest benefit to the greatest number is to be considered. The absurd outcry about the restricted sale of perchloride of mercury and cyanide of potassium makes me wonder how those who make it would protect the public in any other way, as well or better, than by the present arrangement. So far as I can see, the enforcement of the law in the cases that have given rise to the complaining is no reflection whatever on the ability of the vendors, or, I may say, the sufferers; they merely infringed the law and took the consequences. Some of your correspondents take exception to the druggist supplying bicarbonate for carbonate of soda, &c. If they could spend a day or two behind the counter of a chemist and druggist, they would be considerably enlightened on the nomenclature of drugs and chemicals used by the general public.

Edward Dunmore.

EXPERIMENTS WITH DIAPHRAGMS FOR HALF-TONE WORK.

In the face of the great interest which is at present taken in the formation of the dot in half-tone work, the following notes by T. J. Placzek of some experiments undertaken at the suggestion of Dr. Eder, and reported in the current issue of the *Photographische Correspondenz* will throw some light on the subject.

Although the high perfection of half-tone work is usually ascribed to the excellent cross-lined screens which have been placed on the market, of the best quality, still every one who works the half-tone process knows, only too well, what an important part in the preparation of half-tone negatives the size as well as the shape of the diaphragm plays and that only with intelligent use of the same can a good result be hoped for.

Whether the square or the round diaphragm is better can be easily determined.

It is, indeed, possible with diaphragms of correct size to obtain good results with the round as with the square. An easier coalescence of the dots in the high lights is undoubtedly obtained with the square stop, as the corners of the square dots thus formed produce a quicker closing up of the same.*

The transparent dots in the lights are also, when a square stop is used, much larger without a network being formed in the lights, which can easily be proved by a comparison of figs. 1 and 2.

Fig. 2 shows the formation of the dot with a round stop which is more favourable to the formation of a network.

Fig. 1.

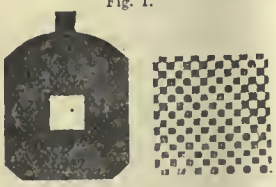
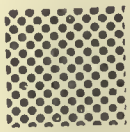


Fig. 2.



As however larger dots can be sharpened in the lights by longer etching as the result of which the block may be etched deeper, and such blocks also print better, which also speaks favourably for the square stop. Therefore the advantage ought, as a rule, to lie with the square diaphragm. Still better acts the stop when the sides of the square aperture are slightly rounded towards the middle (fig. 3).

If a negative is examined which is made with an exact square stop (fig. 1), it will be found that the transparent dots are almost square; the best form of dot, however, is that in which the transparent dots in the lights approach the circular form, which may be fairly well obtained with the diaphragm (fig. 3).

Fig. 3.



Fig. 4



Levy's square stops with cut-out corners (fig. 4) are also very much liked. These also give rounded transparent dots in the lights, without which the formation of a network would easily appear. The points are similar to those produced with stop (fig. 3).

The theory of half-tone work has already been thoroughly investigated by Dr. J. M. Eder, and I shall refer to this. To better understand the following, I will just mention the principal rules of the half-tone process.

As is well known, the screen dot is the product of a pinhole camera, since the transparent openings of the screen act like a series of many pinhole cameras lying close to one another. The formation of the dot on the sensitive plate is dependent, besides the diaphragm aperture, on the distance of the sensitive plate from the screen, on the one hand, and to the optical centre (diaphragm slot of the lens), on the other.

Moreover, to explain these phenomena, let us consider the formation of the dot as normal in fig. 5.

In figs. 5–8, a denotes the diaphragm aperture, b, the aperture of a transparent screen hole, c, the distance of the sensitive plate from the screen; d, the distance of the screen from the optical centre; e, the dot formed on the sensitive plate.

If the distance, c, is increased (fig. 6) the dot e will become larger, which, however, can also be attained by a larger stop (fig. 7), or by a shorter-focus objective (fig. 8).

Small dots are therefore formed if small stops, a shorter screen distance, or a lens with long focus, be used.

The small diaphragms give, as I have mentioned above, small black dots in the negative.

Since the shadows ought only to be formed in the negative by small dots, small stops are only suitable for the shadows, which are well delineated.

* In order to avoid any misunderstanding in interpreting the figures in this article, let me at once state that the whole of the dots correspond to about a sixteen times enlargement of the original screen negatives, so that the black dots of the diagrams correspond to the covered parts of the negatives. The diaphragms given with the enlargements correspond to those with which the dots were obtained, and are about one-fifth their natural size.

In the lights, however, the dots are too small; the same stop which will give good worked-out shadows gives flat lights. There is formed

Fig. 5

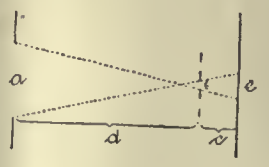
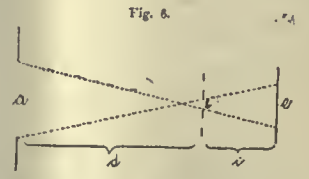


Fig. 6.



over the whole of the picture a network which makes the negative useless.

As is shown in fig. 7, large stops give larger dots; if therefore one exposes with large stops, the dots in the lights will be good, but in the shadows there will be places free from dots.

Fig. 7.

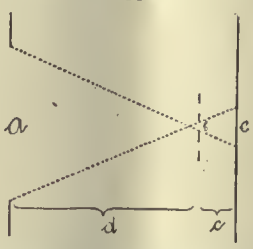
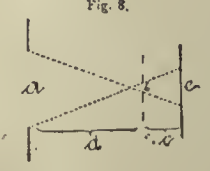


Fig. 8.



If the exposure be so prolonged that the shadows also showed dots, the lights as a rule would be closed up too much, and the fine dots in the negative in the subsequent transference to metal can only be etched with difficulty, or not at all.

A very small stop is therefore of as little use by itself as a very large one; with medium-sized stops it is possible, with suitable method of working, to obtain useful negatives with one exposure. If an exposure is made first with the small and then with the large stop, the shadows as well as the lights will be well worked through with greater certainty. Since the rapidity of the lens becomes considerably less when using small stops according to the formula $\left(\frac{d}{F}\right)^2 : \left(\frac{d'}{F'}\right)^{2\dagger}$, it is actually quite logical that the exposure should be longer, and, as a rule, the small stop requires two-thirds of the whole time of exposure, whilst one-third is devoted to the large stop.

If there are very deep blacks in the original, an exposure should be made with a very small stop on a sheet of white paper, by which means the shadows are cleared up and will not be so clogged in printing.

It might be thought from the above that the half-tones would not be well represented; this, however, is not the case, since the large stops work on the shadows and the small stops on the lights, and therefore by the combination of the two actions the half-tones obtain their full value. It is therefore much easier to attain good results by changing the diaphragm during the exposure than with one stop and one exposure.

In a recent book on the half-tone process‡ formulæ have been recommended for practice which give the correct size of diaphragms. By the aid of these diaphragms with carefully reckoned sizes, a change of diaphragm is almost always unnecessary, since these diaphragms give well-worked-out shadows and lights.§

Although theoretically the fact is perfectly correct, it will be, since the size of the diaphragm has to be reckoned out for every exposure, difficult to carry out in practice on account of want of time.

If the measurements of the transparent places in the screen, the distance of the sensitive plate from the screen as well as from the optical centre of the lens are not accurately carried out, great errors will arise, which will not give the expected results.

† d = diaphragm aperture; F = the focus of lens.

‡ The Halbton process, by Julius Verfasser, translated by Dr. G. Aarland.

§ The size of the diaphragms can be calculated from the formula $a = \frac{c+d.\ b}{e}$ (fig. 5).

With calculations accurately performed, dots in the high lights coalescing, and small dots in the shadows will be obtained.

Even if everything is satisfactory, unfortunately half-tone negatives which have been prepared with one diaphragm give frequently pictures wanting in detail, which are poor in the half-tones, a fact of which I have been convinced for a long time.

If the dots are not satisfactory when a negative is prepared by changing the diaphragm the negative can still be corrected. With these corrections the half-tone negative is very convenient to work with. It is not necessary to take much care of the shadows, but more of the lights and the dots should just touch; still, if the dots in the lights do not quite touch, so that a faint network is noticeable, it is possible to make the dots touch by the lead intensifier, which builds up a dense deposit.

By reduction the dots which are too large in the shadows can be sharpened up without the lights becoming more open.

By various intensifiers it is possible to obtain the lights more open or more closed, as may be desired.

With the mercurial intensifier the dots are least, with the lead intensifier most, spread out. Between the mercury and lead intensifier stands the copper intensifier, with which, as a rule, success will be attained.

The best form of diaphragm is, as mentioned above, the square. The position of the diaphragm opening must be such that the side of the square crosses the diagonal screen lines.

The size of these stops is, for preliminary exposure, from *f*-40 to *f*-50;* for the shadows, *f*-15 to *f*-20: and, for the lights, *f*-12 to *f*-15.

For the large stop, *f*-12 to *f*-15, Levy's stop (fig. 4), or a square stop, which has only two opposite corners cut out, should be used.

If the above fundamental principles are relied upon for practice, it will be easy to immediately obviate any fault that may be formed.

The formation of the dots is easy to regulate. If the requisite care is taken in working, larger or smaller dots may be obtained without trouble, as the original or easy etching may require.

It is interesting that the dots approximately assume the shape of the diaphragms.† With double perforation of the diaphragm, in many cases there is obtained, instead of one point, two.

This process, with irregular or with several apertured diaphragms, Count V. Turati, of Milan, has specially worked out.‡

In the experiments here detailed, a Voigtländer euryscope of 86 cm. focus, and a Levy's cross-lined screen of forty-seven to fifty-four lines to the cm. were used.

The distance of the screen from the sensitive plate was fixed, comprising the thickness of the glass of the screen and the closest possible approach to the sensitive plate.

If diaphragms with triangular apertures in various directions are used (figs. 10 and 11), the dots will also show as small triangles, which are slightly differently arranged, according to the position of the triangle.

Very beautiful results were obtained with diaphragm (fig. 11). There

Fig. 9. Fig. 10.



Fig. 11.



were formed between four dots a small dot, which was wanting in the deepest shadows, but appeared in the half-tones and high lights.

The same effect is obtained with this diaphragm as with a screen of double the fineness. The action is exactly similar to Levy's triple-line screen.

* That is to say, the length of the side of the square in proportion to the focus.

† The original form of the dots is considerably altered by intensification or reduction.

‡ Eder's *Jahrbuch*, 1896. *Photographische Mittheilungen*, 1896.

Fine screens cannot be used if, as fig. 11*a* shows, the dot formation is striven for, since these fine dots will not stand etching. On the other

Fig. 12. Fig. 13.



Fig. 14. Fig. 15.



Fig. 16. Fig. 17.



hand, the results obtained with coarse screens are equal to those obtained with fine, and therefore much dearer, screens.

It is, however, not so easy to obtain the small dot (fig. 11*a*) exactly in the middle, and this must be determined by experiment.

Fig. 18. Fig. 19.



Fig. 20. Fig. 21.



Fig. 22. Fig. 23.



Fig. 24. Fig. 25.



If the distance of the ground glass from the optical centre of the lens is altered, two things may happen: the small dots may move up or

down, coalesce with the large dots, and a pear-shaped dot (fig. 11*b*) is formed, which has its point directed either up or down. This may be also obtained if the centres of the two apertures are approximated or moved further apart.

With double perforated diaphragms, therefore, the dots may be made closer or farther apart, and thus the most different results attained. If the position of the two aperture centres are altered, so that the line which joins them to the centre of the aperture of the screen is made nearer without becoming parallel, various zigzag lines are formed. In figs. 12 to 19 the position of the dots is seen which can be attained by one diaphragm, but in different positions.

Other diaphragms' shapes and their effects in the preparation of half-tone negatives with cross-lined screens are shown in figs. 20 to 25.

As to the practical value of such diaphragms, I believe that they are, with the exception of fig. 11, of little importance for ordinary monochrome printing, but for half-tone three-colour printing they can be of great use, since, *without altering the position of the screen or the original, by simply changing the diaphragm shape, the position and the shape of the dot can be altered for any colour.*

How easily the position of the dots may be changed by the diaphragm is shewn in figs. 12 to 19. If one considers that by other diaphragm apertures other dots may also be formed, it will be easily grasped how useful these diaphragms may be for colour printing.

To the double perforated diaphragms belong, therefore, a complete knowledge of the theory of half-tone work, how, with safety and certainty, to obtain, with any enlargement, a reduction of the previously described shapes of dots.

If time and opportunity permit, further experiments will be instituted to study the use of stops for colour printing, and the best form of dots for the same.

ACETYLENE GAS.

[London and Provincial Photographic Association.]

The recent discovery by a Canadian chemist, Thomas Leopard Wilson, of the process for the production, on a commercial scale, of calcium carbide, is perhaps the most valuable of modern times. This substance (CaC_2) is obtained by fusing together, by the aid of the intense heat of the electric furnace, common lime, and any material that will form carbon, such as hard or soft coal, coal dust, or coke. The result of the chemical combination is a mass having the appearance of dark grey sandstone, exceedingly hard, exhibiting a purpliah metallic lustre when freshly broken. When this is placed in water, a double decomposition takes place; the oxygen of the water combines with the calcium, forming white lime, which is left as a residue; and the hydrogen of the water combines with the carbon and forms acetylene (C_2H_2).

A few months ago this gas was little more than a chemical curiosity, produced only by costly and elaborate processes; but now, owing to the discovery referred to above, it can be brought into the practical reach of every one, and, by means of a suitable generater, can be used with absolute safety for a variety of purposes. The quantity of acetylene produced from one pound of calcium carbide is about five cubic feet, and, if special burners are used, no more than one cubic foot is required to give a light upwards of sixty candle power for one hour. In colour, the flame from acetylene is beautifully pure white, the spectroscope shewing scarcely any difference between it and daylight. On comparing the gas with any illuminant of equal power, it will be found to give out much less heat and to consume a smaller quantity of oxygen in its combustion. Acetylene gas has a strong garlic-like smell, so that a leakage in pipes or fittings would be immediately detected should the gas be adapted for general house lighting.

I have here a generator which, with the valuable aid of my friend, Mr. F. S. Thorn, has been placed upon the market specially for lantern work. Before proceeding to charge and set it in action, I should like to point out that acetylene as generated is hot and extremely moist; and this moisture, held in suspension, must be removed, or it will be deposited in the pipes and fittings leading to the burners, with the result that the light would jump and eventually go out exactly as house gas would under similar circumstances. To prevent this, the gas is first drawn down through the water into a cooling chamber, situated at the bottom of the generator, from which it issues practically dry and ready for use. We will now read the instructions sent out with the apparatus, and proceed to set it in action.

In our first experiments the generater was made of zinc, and for ornament sake the tops were made of copper, both of which materials we have now abandoned, first, because the heat caused by the reaction had a softening and rotting effect upon the zinc; and, second, because acetylene is asserted by several eminent chemists to form an explosive compound with copper, but personally I have not been able to make an explosion, although I have purposely tried to do so. However, we at once decided to discontinue its use, and the generators are now made as far as possible in galvanised iron, and so far this has given every satisfaction. I shall now be pleased to show you the effect of the light in the lantern.

I have here an illustration of a generator we shall shortly place upon the market specially for house lighting and other purposes. This generator is the result of very careful experiments, and is made on an entirely different principle to the one before you, the main features of this generator being that it can be recharged whilst the gas is burning without in any way effecting the light, allowing an escape of gas, or the admission of air to the holder. It will automatically regulate itself to supply gas for any number of burners from one up to the number for which it is built, and will immediately stop generating as soon as the gas ceases to be withdrawn, and any number of lights can be effectually dealt with by means of this apparatus. Here, ladies and gentlemen, are one or two photographs taken by acetylene gas, and also an illustration of the apparatus for taking same. Like the new generator, this apparatus is about to be placed upon the market, and, as I will now show, this small generater will supply it, but, of course, for a short time only, and it is our intention to recommend a larger size. The gas, if burnt with ordinary burners, as used for coal gas, would be yellow, smoky, and quite unsatisfactory, but, if burnt in Bray's 0000 or 00000 burners, a pure white light is obtained of about eighty to sixty candle power respectively; but even these I do not consider perfect, in fact I do not think that a perfect burner for acetylene is obtainable, as there is always a deposit of black carbon on the nipple, which has occasionally to be cleaned off with a penknife, or, better still, a rather hard tooth brush.

Respecting the cost of lighting by acetylene, the 00000 burners mentioned above consume about one cubic foot of gas per hour, and one pound of calcium carbide yields about five cubic feet of gas; so that light for light, compared with coal gas at 2*s.* 6*d.* per 1000 feet, as obtainable in London, the carbide must be purchasable at about 2*d.* per pound.

Acetylene can be compressed; but, as it goes to a liquid at 900 pounds' pressure to the square inch, beyond which it is impossible to compress it, and as it then occupies as much cubic space as it does in the carbide form, and considering the expense of compressing it and the weight and danger of the cylinder, I cannot see the advantage over a good automatic generator, as the first outlay must be as great as the working expense—considerably greater—so that, in my opinion, compressed acetylene will have a very limited use even if introduced.

In conclusion, I think I may safely predict a splendid future for acetylene, and, in my opinion, it will eventually supersede for lighting purposes either oil, gas, or electricity.

C. Hoddle.

PHOTOGRAPHY IN COLOURS AT NEWQUAY.

Mr. J. W. Bennetto, the alleged discoverer of photography in natural colours, writes to our Newquay contemporary as follows:—

"You have taken such considerable interest in my method of reproducing the colours of natural objects by photographic means, that you may be interested in the test, of which I hand you particulars, and to which I have been submitted in order to satisfy those who were reasonably aceptical as to whether, or not, my results were obtained by photography only.

"I hope very shortly to have the pleasure of exhibiting, in Newquay, several pictures produced by the above method, and, doubtless, they will give the same satisfaction and pleasure to Newquay people as they have already given to several distinguished persons who have seen them."

The following particulars of the test referred to are given by our contemporary:—

"Mr. Bennetto being willing to submit himself to a test, the following gentlemen agreed to act as a committee, viz., Mr. C. O. Clark, Mr. J. C. Lomax, and Mr. G. Welman. A colour test had been prepared by Mr. Lomax, who is a well-known artist, in the shape of a rough sketch with bands of various colours at the bottom of the sketch. The dates of the week, month, and year were in different colours. As will be seen from the report, Mr. Bennetto was blindfolded, and did not see the original test till after he had shown his result and it had been carefully examined by the committee. The following is a copy of their report:—

"On Monday, August 31, 1896, Mr. Bennetto was blindfolded, and photographed in our presence a picture which he had not seen.

"The picture was then sealed up, and he did not see it until after he had shown us the result on Thursday, September 3.

"He then showed us a transparency on glass.

"The exposure had been made in perfect ignorance of the subject, and the focus was not correct; under these circumstances we consider that the result represented the colours of the picture sufficiently to prove that Mr. Bennetto can produce colours by photography in a transparency on glass. We are satisfied that the result was obtained *bonâ fide* by photography alone."

The spectacle of Mr. Bennetto, when blindfolded, taking a photograph must have been very strange, and we are not surprised to learn that the "focus was not correct." The qualifications of "the three well-known Newquay gentlemen" to act as referees in so important and abstruse a matter as the verification of results alleged to be photographs in the colours of nature are not stated; but we congratulate them on the very guarded nature of their report. They remark: "*We consider*

that the result represented the colour of the pictures sufficiently to prove that Mr. Bennetto can produce colours by photography in a transparency on glass," which says very little in support of the claims of Mr. Bennetto, who, perhaps, is more easily satisfied than either we or our readers are.

The blindfolding—the necessity for which has not been explained—is a very remarkable feature of the proceedings; and we are certainly of opinion that Mr. Bennetto might choose more scientific methods of establishing his claims. The more he hesitates to exhibit his results and demonstrate his process before those qualified to pass judgment upon it, the longer he deprives himself of the great credit and profit to which, on proof of those claims, he will be unquestionably entitled.

ON THE RÖNTGEN RAYS.*

Now, there is another remarkable property of these rays, or absence of property, if you like so to call it. Rays of light, as we know, admit of diffraction. If you pass light from a luminous point through a very small slit, or a small hole, the riband, or the beam of light on the other side, does not follow merely the geometrical projection of the slit or hole, as seen from the source of light, but is more or less widened, and certain alterations of illumination are visible, a phenomenon referable to interferences, which I have not time to go into. How do these X rays behave under such conditions? It is a very remarkable thing that they do not show these enlargements, or exhibit any sign of interference.

The last number of the *Comptes Rendus* contains a paper by M. Gouy, in continuation of a former paper, but describing experiments carried out in a still more elaborate manner, which proves the truth of this to a very high degree of strictness. He makes out that, if these X rays are periodical, the wave-length cannot well be more than the one-hundredth part of the wave-length of green light, indicating an enormously high degree of frequency.

Now, if we assume that the X rays, like rays of light, and unlike the cathodic rays, are a disturbance propagated in the ether, ponderable matter being concerned only in their origination, not in their propagation, the question arises, What is the relation between the direction of vibration and the direction of propagation? Are the vibrations normal or transversal? We know that the vibrations of the air, which constitute sound, take place in a to-and-fro direction, or what is called normal—that is, perpendicular to the waves of sound. We have the fullest evidence that the vibrations of the ether which constitute light take place in directions perpendicular to that of propagation, or are what is called transversal. To which category do the vibrations belong which constitute the X rays?

If we could obtain polarisation, or even partial polarisation, of the X rays, that would settle the question, and prove that they are due to transversal vibration. But most of those who have attempted to obtain indications of their polarisation have failed. This, however, does not prove that the vibrations are normal, for the peculiar properties of the X rays shut us out—or, at least, almost completely shut us out—from the ordinary means of obtaining polarisation. There is, however, one paper in the *Comptes Rendus*, by Prince Galitzine and M. de Karnojitsky, in which the authors profess to have obtained, by a special method, undoubted indications of polarisation. No reasonable doubt can remain as to the abstract capacity of these rays for polarisation after what has been done by another physicist. I wish I had time to go into the experiments that have been made by M. H. Becquerel in the direction of polarisation; but I have already kept you too long. He had more particularly studied a very remarkable phenomenon, viz., that certain phosphorescent bodies—such as sulphite of calcium, for instance, and salts of uranium—on exposure to ordinary sunlight, give out rays of some kind, which pass through bodies opaque to light, and are able to affect a photographic plate beneath them. So far these agree in their properties with the X rays, which are obtained from a Crookes' tube, which they far more closely resemble than they do rays of ordinary light; but the rays thus obtained were found by Becquerel to admit of polarisation by means of tourmalines in a manner altogether unmistakable. I think, therefore, that we may take it as established that the Röntgen rays are due to some kind of transversal disturbance propagated in the ether.

The non-exhibition of the ordinary phenomena of diffraction and interference is explicable on the supposition that the vibrations in the X rays are of an excessively high order of frequency. I am not sure that a different sort of explanation might not perhaps be possible, which I have in my mind, though I have not matured it; but, save the possibility of that, one is led to regard them as consisting of transverse vibrations of excessively high frequency. This opens out some points of considerable interest in the theory of light, but I am afraid it would keep you too long if I were to attempt to go further into this matter. I will merely remark that, taking the way in which these rays are most commonly produced, viz., as coming from a point where the cathodic discharge in the Crookes' tube falls on the opposite wall, we may understand how it is that vibrations of excessively unusual frequency may be produced. These highly charged molecules, charged with electricity, coming suddenly against the wall, may produce vibrations of a degree of frequency which we are not at all prepared for; but I see by the clock that I must not detain you any longer on speculations.

SIR G. G. STOKES, F.R.S.

* Concluded from page 586.

BLACK-SURFACE MARKINGS ON BROMIDE PRINTS.

[Wilson's Photographic Magazine.]

ALMOST every consumer of enamelled bromide paper has now and then been troubled with black markings on the surface of the developed prints. Sometimes these markings are of the character of pencil marks of irregular shape; sometimes they are all turned toward one direction and the lines are parallel to each other. Frequently, too, they affect an irregular shape, as if a finger dipped previously in some dark staining medium had been passed over them. These peculiar markings have puzzled and annoyed photographers who did not know to what cause to ascribe them. They occur most with glossy or enamelled bromide papers, being very seldom found in matt or rough-surface bromide paper. They do not show in undeveloped prints, but are only brought out in development. An immaculate sheet of bromide paper, uniform in coating, with good emulsion and apparently free from defects, may, after coming in contact with the developer, show these various surface markings, especially if the print has been somewhat undertimed, or if development has been forced in order to get the image out. Lack of bromide of potassium in the developer, too strong or too warm developing solutions, are also liable to increase this trouble. Paper which has become very old may have a greater tendency to show surface markings than if it were of more recent manufacture, although very fresh paper may frequently show the same defect. I have become thoroughly convinced that these black surface markings are due simply to pressure or friction on the sensitive bromide film. I am inclined to think, furthermore, that their occurrence may be dependent to a certain degree on electrical conditions. It is a well-known fact that any friction or pressure is liable to develop a change in electrical conditions. I have been able to observe more than once, in very dry weather, that the very fact of pulling the sheet of bromide paper over another or over a table produced electrisation of the paper; this was made apparent by the fact that it was adhered noticeably to the table on which it was handled. When unrolling big rolls of bromide paper the same phenomenon is liable to occur. If my supposition is correct, this would explain why, some days, these surface markings are more liable to be produced than on other days, and why this should occur at unexpected times and on paper of which the emulsion is otherwise absolutely faultless. All of this brings us down to the fact that bromide emulsion paper is an exceedingly delicate chemical article, which has to be handled with the utmost care. Clean white gloves have been used for some time for handling dry plates and bromide paper in the factories where they are made. But this prevents only soiling the surface of the emulsion film by direct contact with the fingers. The very fact that bromide paper has to be wound and unwound, and has to be packed so that each sheet touches the other, affords many opportunities for the production of future surface markings. The dry-plate manufacturer can to a certain extent avoid this trouble by packing the dry plates in such a way as to keep them separated by means of paper strips, thereby preventing the bromide film from touching anything until it is developed.

Notwithstanding all this, many photographers have been bothered with surface markings, affecting the shape of pencil marks, appearing during the development of their negatives. This effect may almost certainly be produced by causing the slide of the plate-holder to rub against the plate. Think what would occur if dry plates (as bromide paper is) had to be wound up and handled several times both by the manufacturer and the consumer, having each time an opportunity of undergoing friction or pressure on the bromide emulsion film!

Many remedies have been suggested for removing from the printed image these troublesome surface markings. One of the oldest and best methods is to clear the markings away by means of a brush dipped in cyanide of potash solution, but this is rather dangerous on account of the poisonous properties of cyanide of potash. They can also be removed by cleaning the dry print by means of a piece of moistened cotton. This goes much easier if the cotton has been dipped in water containing a few drops of ammonia. All the above remedies are liable to injure the film of the image if they are not very carefully used. To my knowledge the very best and quickest way for removing surface markings is to clean the dry finished print with a tuft of cotton dipped in plain wood alcohol. This allows rubbing to such an extent as to remove easily the stains in question without scratching the film. Ordinary alcohol can be used for the same purpose, but it is far more expensive. Those who do not know of this remedy will be surprised when they find out how easily it will enable them to save bromide prints which otherwise would appear entirely worthless.

DR. LEO BAEKELAND.

The Inquirer.

*** *In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

ARON'S ELECTRIC LAMP.—S. M. J. says: "Will some reader oblige me with the address where this lamp, referred to in the SUPPLEMENT to the JOURNAL for September 4, may be purchased."

RETOUCHING MEDIUM.—"Portraitist" writes: "Allow me to thank Mr. Harold Baker and 'Retoucher' for their replies to my query. My object in writing was, if possible to elicit, if not a formula, at least some information as to what constitutes a *reliable* medium, for, as far as my experience goes, those now on the market are as untrustworthy as well can be. I have used them with the finger tip as recommended by Mr. Baker, and with clean rag as 'Retoucher' directs; I have left a lot of the stuff on, and almost none at all, and sometimes get a good surface but cannot rely upon it, which is my cause of complaint. By the way, your printer makes me look rather ridiculous in speaking of 'a solution of common resin or turps.' I wrote '*in* turps.' He also exactly reverses my written meaning with regard to the ALMANAC formula for retouching varnish. I wrote that I wanted '*no* better surface,' not '*a* better.'"

NON-COAGULABLE ALBUMEN.—E. Freeman writes: "Allow me to thank the correspondents who have so kindly answered my query on the subject of non-coagulable, or, as Mr. Banks calls it, 'inverted' albumen. I have tried the method given by that gentleman in the last ALMANAC, but possibly from some fault of my own I have not been able to arrive at a successful result, as the comparatively small proportion of the albumen that separates on the addition of a very large quantity of the alkaline solution slowly but completely dissolves in the subsequent washing. On the contrary, when employing the method given in the leading article of August 15, 1884, in which a very strong solution of caustic potash is used, I have no difficulty in obtaining a product, in much larger quantity, that possesses all the properties ascribed to the inverted albumen by Mr. Banks, and which thoroughly resists the solvent action of cold water. I surmise from this that possibly a mistake may have occurred in the strength of the soda solution given by Mr. Banks, though, I repeat, my failure may be due to my own fault."

TRIPOD STAND "JAMMING."—W. H. Brown says: "In reply to 'Amateur,' I think, if he will try a simple preparation that I have used for similar purposes for some years past, he will find it just what he wants. It was first given in the JOURNAL whence I 'annexed,' it and have since always kept a small quantity in stock for emergencies. It consists of a mixture of wax and French chalk thoroughly incorporated together under heat. If I remember rightly, the original formula gave paraffin wax, which, of course, is the cheaper; but I now use beeswax in preference, as I think it constitutes a better lubricant. though, of course its cost is greater. Melt the wax and stir in the powdered talc until a small portion in cooling is easily friable. This will be found to combine the 'slippery' qualities of the wax, and talc, is as easy of application as soap, and far superior to that substance or either of the ingredients separately, and, while making any sort of sliding woodwork more smoothly, it also protects it from damp and prevents the 'jamming' which is the cause of 'Amateur's' complaint."

RETOUCHING MEDIUM—J. C. says: "Like 'Portraitist.' I too have suffered much from useless retouching media, and would gladly welcome any really reliable plan by which the unvarnished film can be brought to a suitable condition to take the pencil. After intensification with mercury the gelatine film acquires a matt surface, and presents a most beautiful 'tooth' for the pencil, enabling the most delicate work to be done with ease and certainty. But, then, it is not all negatives that are intensified or that will admit of it. There was an article some time ago in the JOURNAL on the subject of giving an artificial 'tooth' to the film by chemical means, but, as far as I remember, no definite process was given. I find that an alumed and perfectly washed film becomes harder and more repellent of the lead, but that, if the alum is only partially washed out, a 'tooth,' sometimes almost amounting to a 'grain,' is given to the film, which causes it to take the pencil readily. But the difficulty is to get the right surface with certainty. Would it be possible, think you, by simply using a solution of alum or other substance of definite strength, soaking the plate, draining and drying without washing, to arrive at a regular and uniform degree of 'roughness?' or is it possible, as I fear it may be, that every plate may require slightly different treatment? Have any of your readers worked in this direction?"

INSENSITIVE COLLODION EMULSION.—I was unable to put the matter referred to by "Halifax"—the coating of unwashed emulsion plates in daylight—to the practical test in time to reply before, but I can now confirm what was said by W. B. B. recently that such exposure to light must necessarily militate against the clearness of the result, to such an extent, indeed, as to render the practice impossible. A plate was coated with an unwashed emulsion, and placed directly in the slide and exposed for an out-door view, the time given being more than ample to produce a picture under ordinary conditions. After exposure it was well washed and a normal developer applied for at least double the time that would have sufficed to fully bring out the image under proper conditions, without, however, developing even a trace of the sky. The film was rinsed and again exposed for the same time, and, on reapplying *the same developing solution*, an over-exposed image was instantly produced. Another plate was coated in the diffused daylight of an ordinary room, washed in the dark room, and exposed for a similar time in the camera. Result: An amount of fog that could scarcely be deemed 'an advantage in the shadows.' In fact, a merely momentary exposure of the unwashed plate to very weak daylight is sufficient to give a very palpable veil. Hence, though an emulsion containing excess of bromide is slow enough to be useless in the camera without washing, it is not sufficiently so to bear coating in daylight.—SYNTAX.

Our Editorial Table.

SAMPLES OF CHRISTMAS CARD MOUNTS.

Bradford and London: Percy Lund & Co.

MESSRS. LUND, as is their annual custom, send us a number of samples of mounts, suitable for bearing photographs, inscribed with Christmas and New-year's greetings. They are simple but elegant in design, and in such variety of form and tint as to lend scope for the gratification of all tastes. The custom of sending one's friends mounted photographs, as emblematical of good wishes, at the close of the year, is a pretty one, and is much encouraged by those who lay themselves out to supply suitable mounts.

THE PRIMUS LANTERNIST'S POCKET-BOOK.

W. Butcher & Son, Blackheath, S.E.

BESIDES serving the purposes of a diary of engagements, this neat and convenient pocket-book gives several tables likely to prove



serviceable to lanternists, and provides spaces for noting the quantities of gases used and other memoranda. Lanternists will find it well worth pocket space.

A HOLIDAY TOUR IN AND AROUND WHITBY.

By H. S. FORMAN. Bradford and London: Percy Lund & Co.

MR. FORMAN had his camera with him during his sojourn in Whitby and its neighbourhood, of which he writes with great appreciation and sympathy. Some charming photographs of the old world fishing town on the Yorkshire coast, studies of fishermen, their women folk, children, and surroundings, and views of some of the scenery in the immediate district, illustrate the little book. The blocks are printed in ink of a warm colour, and the book delights the eye with its pleasing get-up, paper and printing being of the best.

MESSRS. PENROSE & Co., the well-known process house, send us two minute pocket-books, which the process man should find serviceable. One, compiled by Mr. F. Godfrey Cole, is a ready reckoner for calculating the number of square inches in blocks, stereotypes, and electrotypes. This gives the information wanted at a glance. The other briefly tells how to use the chief apparatus necessary in the production of a half-tone block, and is full, from cover to cover, of sound practical hints.

How to be a Successful Amateur Photographer.

By W. J. Lancaster, F.C.S. Birmingham: J. Lancaster & Sons.

Mr. Lancaster's little book is in its sixtieth thousand, which says a great deal for its popularity and value. The beginner will find it a useful guide to the rudiments of photography. It includes several reproductions of photographs taken with the well-known and widely used apparatus of the firm, and is altogether a handy primer to place in the way of the photographic novice.

Formulaire des Nouveautés Photographiques.

By Georges Brunel. Paris: J. B. Baillière et Fils.

M. Brunel's book, which has 144 illustrations, is practically a compendium of what is new in photography during the last two or three years. Thus, in the apparatus section, there are detailed descriptions of the latest introductions, chiefly of French origin, and a like office is performed with regard to receipts and formulæ, drawn from many sources. The work extends to nearly 300 pages, and must have cost its author a great deal of labour and research in its compilation. It forms one of a series of books of useful knowledge, and has been brought well up to date, radiography and colour photography occupying much of its space.

Catalogue Received.

J. E. Hill, 5, Chancer-place, Bradford.

Mr. Hill's list is devoted to club portrait work, enlargements in various kinds of printing, oil work, &c. His prices appear to be reasonable, and he appeals to the trade only.

Fallowfield's Photographic Remembrancer.

[J. Fallowfield, 146, Charing Cross-road.

The latest number of this useful, and now very old, friend has reached us. Mr. Fallowfield well maintains the charter of telling the world what is latest and newest in photography. The *Remembrancer* particularises many items of apparatus and photographic sundries, handy alike to professionals and amateurs. As usual, it is issued gratis to applicants.

Enameline Miniatures.

Mrs. L. M. Williams, Camden-place, Bath.

Some specimens of enameline miniatures have been submitted to us by Mrs. Williams. Their distinctive feature is that the colouring is applied to carbon bases, thus avoiding the risks of impermanency. The carbon prints are specially prepared for this process, and the oil colours are applied to both the back and the front of the picture. Most charming results of a highly artistic nature are produced by Mrs. Williams's method, which should help to give increased popularity to coloured miniatures. Professional photographers will find the charges extremely moderate.

News and Notes.

The Annual Exhibition of the Romford and District Photographic Society will be held in December.

Fire at a Photographer's.—We are sorry to learn that on Saturday, the 5th inst., the premises of Mr. H. J. Godbold, photographer, of Hastings, were destroyed by fire.

Mr. J. Laing, Photographer, of Castle-street, Shrewsbury, is retiring from the business, which he has carried on thirty-three years. His successor is Mr. R. L. Bartlett, who was in Mr. Laing's employ as chief operator for eighteen years.

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, September 23. Subject for discussion, *Halation, its Cause and Cure.*

According to a paper on "Explosion and Detection of Acetylene in Air," by Prof. F. Clowes, mixtures of air with 3·81 per cent. of acetylene are explosive. The best method of estimating acetylene in air is based on the examination of the change occurring in a hydrogen flame when such air is passed over it.

It is stated that important improvements in Röntgen photography are announced from Berlin. The most interesting is a simple method of photographing the stomach and intestines. It is only necessary for the patient to drink some harmless solution of mineral salt, such as lime water, which is as impenetrable as bone to X rays, and excellent results are obtained.

Aintree Photographic Society.—This Society will hold their Third Annual Exhibition of Photographic Work and Home Arts and Industries, including Amateur Painting by local artists, in the Aintree Institute, Aintree, near Liverpool, on Thursday and Friday, December 3 and 4, 1896. The Judges in the Photographic Section are Messrs. T. F. Floyd and F. Anyon (members of the Liverpool Amateur Photographic Society). The Exhibition Secretary is Mr. E. P. Heron, 2, Tilney-street, Orrell-park, Aintree, Liverpool, of whom entry forms and particulars may be had.

City of Manchester Municipal Technical School.—During the session 1896-97 a series of lectures on Photography will be delivered by Mr. C. F. S. Rothwell, F.C.S. The first course comprises thirty lectures, and is suitable for those just beginning the study of the subject, either as apprentices or amateurs, whilst the second or advanced course, also comprising thirty lectures, is intended for those already familiar with the processes described in the first course. The lectures will be illustrated by the most modern apparatus, and each process will be practically demonstrated. Towards the end of the session it is intended to arrange a few photographic excursions, to take place on Saturday afternoons. Particulars may be had of Mr. J. H. Reynolds, Director and Secretary, at the School, Princess-street, Manchester.

By command of the Queen a Royal warrant has been sent to Mr. Horatio Nelson King, appointing him Architectural Photographer to Her Majesty. We learn that Mr. King was summoned by telegraph from Windsor to photograph the recent Royal garden party at Buckingham Palace, also to photograph the private chapel at the same place immediately after the wedding, the results in each instance giving great satisfaction. This must be very gratifying to one who, for upwards of forty years, has worked for the Queen to find he has not been forgotten. Mr. King, in a note to us, said: "It may interest you to know that to-day I completed my 280th journey to Windsor Castle, doing special work at the Albert Memorial Chapel, the journeys extending over twenty-five years, and the railway distance 14,000 miles," a record we do not think can be equalled by any other artist.

The most powerful light-house in the world is that which is now more than half finished, on Penmark Point, Department of Finisterre, and will probably be inaugurated at the end of next summer. The height of the tower is 63 metres (says a contemporary), which will enable it to be seen during the day from a distance of 30 kilometres in fine weather. During the night its light will be visible for 100 kilometres. The great illuminating power of the light will be realised by means of the apparatus, inaugurated in France in 1892 at the Hève Lighthouse, with its lightning flashes. The principle on which these lightning flashes are based is that a flash of lightning lasting no more than one-tenth of a second suffices to produce on the retina its complete effect. Starting from that principle, the new light-house will send flashes of concentrated light over the ocean every five seconds, though they will last but one-tenth of a second. The Penmark Light will have cost, when completed, 24,000*l.*, half of which is provided by the State, and half by a legacy from the Marchioness de Blocqueville, a daughter of Prince D'Eckmuhl.

Acetylene Poisoning.—At a time when great efforts are being made to advance the industry of lighting by acetylene, says a correspondent of the *English Mechanic*, it is interesting to have some data as to the hygienic properties of this gas. Some investigations have just been made on the subject by M. Gréhant, Professor of Physiology in the Natural History Museum, and their results should be known to the public. M. Gréhant has first studied the subject from its poisonous point of view, and, contrary to former assertions, has found that acetylene is poisonous when taken in any quantity whatever, but in the same way as carbonic acid gas, *i.e.*, an unbreathable gas, and not as carbonic oxide, or a poison properly so called. In other words, to be suffocated, one must take a mixture of 30 to 40 parts of acetylene to 60 or 70 of air; but, after a partial poisoning, the blood very rapidly gets rid of the unbreathable gas. In the second place, M. Gréhant has found that, when combustion is complete and perfect, the products of combustion do not contain the least trace of carbonic oxide—a fact which is very favourable to the use of the new gas. But one must always bear in mind that acetylene, when burnt badly, liberates a quantity of carbonic oxide, such a formidable poison, and care should therefore always be taken not to employ defective apparatus. An important fact in connexion with the employment of this gas in public and private buildings is that mixtures of acetylene and air give much more violent explosions than mixtures of ordinary coal gas and air. These mixtures are explosive from 1 part of acetylene to 3 of air, to 1 of acetylene to 19 of air, while mixtures of coal gas and air are explosive only between the ratios of 1 to 3 and 1 to 11. A mixture of 1 part of acetylene to 9 of air gives the most violent explosion. The light given by acetylene is such that, if one stares at an ordinary bat's-wing burner for one or two minutes, a very bright image is left on the retina, which lasts for an unpleasant length of time. Care must be taken, therefore, in lighting schoolrooms or offices by acetylene, not to use a light which is too strong for the eyes, and inventors should devise some satisfactory means of modifying the light.

Patent News.

The following applications for Patents were made between August 31 and September 5, 1896:—

Viewing Zoetropic Pictures.—No. 19,181. "An Apparatus for Viewing Chrono-photographic or Zeotropic Pictures in an Ordinary Optical Magic Lantern." C. Wray.

Stereoscope.—No. 19,373. "An Improved Form of Stereoscope, Convertible into Spectacles, Spectacle Stereoscope, Hand Magnifier." J. Wilkinson.

Animated Photographs.—No. 19,446. "Apparatus for Taking and Projecting Animated Photographs." Complete specification. L. Korsten, G. Melies, and L. Reulos.

NEGATIVE HOLDER.—No. 19,588. "Improved Holder for Photographic Negatives and Films." C. E. FEW.

DRYING RACK.—No. 19,676. "An Improved Drying Rack for Photographic Plates and the like." D. ALLAN.

PRINTING FRAME.—No. 19,679. "An Improved Printing Frame for Photographic and other Purposes." D. ALLAN.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

September.	Name of Society.	Subject.
21	Bradford	*Figure Studies and Pictorial Portraiture.* P. R. Salmon.
21	North Middlesex	*Platinotype.* J. W. Marchant, F.R.P.S.
22	Birmingham Photo. Society	Exhibition of Apparatus.
22	Dulwich	Demonstration of Lantern-slide Making. S. J. Withers.
22	Hackney	*Travels in Sicily.* A. L. Henderson.
23, 24	Ashton-under-Lyne	Exhibition of Prints by the Members.
23	Leeds Camera Club	*Toning of Platinotype Prints.* Rev. J. Beanland.
23	Photographic Club	Halation, its Cause and Cure.
24	West Surrey	Annual General Meeting.
26	Birmingham Photo. Society	Excursion: Leamington and Offchurch. Leader, E. C. Middleton.
26	Borough Polytechnic	Excursion: Northwood and Moor Park.
26	Darwen	Exc.: Turton and Jumbles. Leader, John Broome.
26	Leytonstone	Exc.: Valley of the Roding. Leader, Dr. W. P. Turner.
26	South London	Excursion: Battersea Park. Leader, F. W. Grigg.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 10,—Mr. T. Bedding in the chair.

Mr. HODDLE read a paper on—

ACETYLENE GAS. [See page 602.]

During the reading of his paper, Mr. Hoddle showed the operation of converting the calcium carbide into gas by immersing a piece in a vessel of water, when, on the application of a light, it burst into flame. The outside cylinder of the apparatus was filled with water up to a line marked inside, and the carbide receptacle, which is pierced at the bottom so as to give the water access to its contents, was charged with a quantity of the carbide and securely fastened when it was inserted in the apparatus, and the gas began to form. It took five or six minutes to get a perfect flame owing to the presence of an excess of air in the machine which had to be got rid of. It had been said that a mixture of air with acetylene was very explosive, but he had failed to produce any such thing under any conditions. The lecturer showed the difference in the heat of the flame that exists between pure acetylene and when mixed with air, the heat of the former being noticeably less. He also showed a lantern jet fitted for the use of this gas, in which the burners were so disposed that the flame of one was flat with the condenser and the other at right angles, which arrangement was claimed to be more advantageous. A special fitting carrying twelve burners for photographic work was next shown at work, and specimens taken by its means. In taking these a space of about eight feet separated the sitter from the source of light, and this, with an exposure of four seconds at *f*·8, produced satisfactory results.

Mr. HENDERSON mentioned a case where the burners had been very quickly choked up, and asked the reason.

Mr. HODDLE could not understand it, unless the arrangement for cooling the gas was imperfect. He further replied that there was no gain in combining coal gas with acetylene. He showed the effect of running too many lights from a generator constructed to supply only a certain number, the light after a time getting jerky owing to the gas being consumed before quite cool.

Mr. HADDON suggested that the choking of the burner was due to overheating of the burner, which caused a change in the nature of the acetylene.

Mr. BANKS had compared the actinic power of acetylene with an oxy-hydrogen blow-through jet, and was understood to say its power was about two-thirds of the latter.

Mr. HODDLE said that Mr. Ives had stated it to be equal to the Welsbach light.

The CHAIRMAN had seen it pitted against an oil lamp and an incandescent light, but found it much whiter than either.

PHOTOGRAPHIC CLUB.

SEPTEMBER 9, Mr. Newell in the chair.

The HON. SECRETARY made several announcements with regard to the forthcoming session, the programme for which promises to be of a satisfactory nature.

Mr. W. D. Welford showed two panoramic views of Cumberland Fells. These consisted of two series of five pictures each. The negatives were made with a half-plate camera and a twelve-inch focus lens.

An interesting discussion upon the general principles underlying the production of panoramic photographs occupied the meeting. It was generally agreed that a series of pictures made on flat plates, and mounted so as apparently to join, would be unsatisfactory and untrue. The better method is to use a curved plate, as in the original panoramic camera, and to bend the resulting picture to a similar curve. It was suggested that, in cases in which it is desired to follow the easier method, more satisfactory results are obtained by allowing a space of about one-eighth of an inch to separate each photograph. This permits each picture to be looked at separately and from its proper point of view, that is to say, from a position opposite to it. At the same time, there is an appearance of panoramic continuity. Mounted in this way, panoramic views do not obtrude any technical discrepancies in tone or colour to so great an extent as they do if mounted in close juxtaposition.

MANCHESTER PHOTOGRAPHIC SOCIETY.

SEPTEMBER 10,—The President (Mr. H. M. Whitefield) in the chair.

Mr. WHITEFIELD opened a discussion on the

FIXING AND WASHING OF PRINTS,

including the various kinds of print-washers. He (Mr. Whitefield) in his opening remarks, stated that twenty-six years ago the time taken in washing prints was much longer than at present, as it has been demonstrated that quick but thorough washing is the best to ensure permanency in both albumen and gelatine prints; also, in the case of gelatine papers, there is a certain amount of alum in the emulsion, which, if subjected to prolonged washing, is driven out, and the film consequently becomes soft and awkward to handle. The Chairman stated that a few years ago Mr. Edwards showed at one of the meetings a washer with wooden trays with gutta-percha netting and syphon automatic changing. He now showed the members a washer on somewhat the same lines, but a more perfect changing apparatus, as Mr. Whitefield had tried most of the washers on the market, and had come to the conclusion that there was not a perfect automatic washer on the market, and that syphon washers were not good to use on account of the water running out and leaving the prints out of the water until filled up again.

Mr. BLAKELEY did not agree with Mr. Whitefield. He had had a syphon tank in use for twenty years, and never found it choked, or any of the disadvantages which the Chairman mentioned. An article describing Mr. Blakeley's washer was published in THE BRITISH JOURNAL OF PHOTOGRAPHY for January 2, 1880.

Mr. J. MORLEY BROOK uses two dishes, and transfers the prints from one to the other, changing the water each time.

Mr. S. L. COULTHURST adopts the same plan, also occasionally squeegeeing the prints on plate glass in order to force the moisture out as much as possible.

Mr. HARRY WADE stated that, when there is a large batch of gelatine prints to be fixed, it is better to use two baths, as the first becomes discoloured and contaminated. He also used the dish method of washing, giving twenty changes from dish to dish.

North Middlesex Photographic Society.—September 14, Mr. H. A. Rutt in the chair.—Mr. A. J. D. Forster, 102, Florence-road, Strond Green, and Mr. H. Crouch, 30, Beaumont-road, N., were nominated for membership. Mr. C. M. Hamm was duly elected a member. The PRESIDENT (Mr. Mummery) announced that the annual Exhibition of members' work was fixed for November 30 and December 1 and 2, and the day for sending pictures in was Friday, November 20, up to nine o'clock. The report on the Greenford and Headstone Manor outings having been given, Mr. TAYLOR, of the Autocopyist Company, proceeded to give a demonstration on the Photo-autocopyist. He explained the process, and pulled off several prints, which were passed round. He also showed how the process could be used for copying line drawings and writing, instead of having special apparatus for both processes, the main difference being that the gelatine-coated film was simply wetted with water and wiped dry, and the paper, written with special ink, laid down for one minute, and the film inked up, and a copy was obtained by using a roller instead of a press.

Leeds Camera Club.—The opening of the session 1896-97 took place on Wednesday evening last at the Grand Restaurant, Boar-lane. There was a crowded and enthusiastic attendance. The chair was occupied by Major Norwood, and supported by the Rev. — Addison (President of the Wakefield Photographic Society). By the kindness of Mr. J. H. Rigg, an exhibition of the cinematograph was given, and gave unbounded satisfaction. A very successful smoking concert was held afterwards, when songs and recitations were given by Messrs. Smith, Swinden, Palliser, Gaunt, Rathmell, and Crawshaw. Professor Needham ably presided at the piano. A hearty vote of thanks was given to Mr. Rigg and the *artistes* for their entertainment. The new syllabus was distributed amongst the members, who were delighted to find such an interesting and instructive programme placed before them, and it argues well for the success of the Club. Meetings take place every Wednesday evening until the end of April next year. Next week a lecture and demonstration on the wet-collodion process for lantern slides will be given by Mr. J. W. Garbutt.

1896. FORTHCOMING EXHIBITIONS.

Sept. 24-Nov. 7	Photographic Salon, Dudley Gallery, Piccadilly. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 28, 29	Lewisham Camera Club. H. M. C. Sprunt, 192, New Cross-road, London, S.E.
,, 28-Nov. 12 ...	Royal Photographic Society. R. Child Bayley, 12, Hanover-square.
December 3, 4.....	Aintree Photographic Society. E. P. Heron, 2 Tilney street, Orrell Park, Aintree, Liverpool.
Dec. 1896-Jan. 1897	Bristol Internationa'.

Correspondence.

☞ Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

"WHO INVENTED THE KINESIGRAPH?"

To the EDITORS.

GENTLEMEN,—I do not like to trespass on your space in connexion with what may seem a purely personal matter; but my attention has been called to an article which appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY, in which the question is asked, "Who invented the kinetoscope?"

The writer of the article (Mr. A. T. Story) says: "The newspapers have set their busy pens to work upon it. and Mr. Edison has again been deluged with eulogistic ink. But is Mr. Edison entitled to this praise?"

Perhaps you will allow me to state that, years before Edison took out a patent in connexion with "moving pictures"—before he had even got so far as to throw out his usual hints in the press as to what he was going to do in the matter—I had invented the kinesigraph, as I called it, patented it, made it, and worked it.

Close behind me came Mr. Friesee Greene; then came Mr. Edison with his kinetoscope toy; and finally M. Lumière, Mr. Paul, and Mr. Acres some few years later still.

Not only was I the first to *patent* the invention, which, so far as credit is concerned, is a secondary matter, but I was the first to invent it by more than a dozen years. As long ago as 1877 I had a model made, and the whole thing was described in *Nature* in almost the identical words in which Mr. Edison announced his "coming" marvel to an expectant world in 1892.—I am, yours, &c., WORDSWORTH DONISTHORPE.

Somerlea, Reigate, September 12, 1896.

PHOTO-CHEMISTS—PHARMACEUTICAL CHEMISTS.

To the EDITORS.

GENTLEMEN,—I do not think Mr. Hampson's two letters improve matters; he has not travelled much amongst them, or he would have seen a great lack of chemical knowledge if questioned on any article out of their special lines. Travelling amongst them for over thirty years, I have often been amused by their replies to amateurs, and, with all our photographic literature, it is necessary for a successful dealer to help them over many difficulties.

In one of Mr. Hampson's, or some other pharmaceutical chemist's earlier letters he spoke of these chemists being the pioneers of photography. Now, I happen to have all the ALMANACS of the BRITISH JOURNAL from the first issue, bound up with the advertisements, and, looking over one of those small numbers when they were the size of Letts' waistcoat pocket diary of over thirty years ago, I find they were far from the pioneers; in fact, in running over the names of twenty-six advertisers, there were only three of them chemists, and they were something more than the ordinary chemist, because they were also dealers in scientific apparatus, and therefore justly included photographic apparatus.

Who have we to thank for the cutting prices now ruining the photographic trade but the chemists? Only lately an amateur had bought a Frena of a cutting chemist, who could neither give him directions nor show him how to get inside, and the amateur had to take it to a dealer to get him to open it. In a town of 60,000 a pharmaceutical chemist was not content with selling gold chloride (best) at 1*s.* 9*d.* per 15-grain tube, but, to get the custom from a dealer, gave in with it an ounce of either soda acetate or phosphate. The dealer, instead of retaliating, sent all his customers to the chemist, and told them they could get an ounce of any salt given in; this went on for a time, the dealer did not lose much, as the chemist soon shut up.

Now, in the name of goodness, why should a dealer sell gold for less profit than a grocer gets on sugar, for the quantity sold 1*s.* 10*d.* is quite little enough?

Dealers, if they wish to use the term, need not be afraid to style themselves photographic chemists, the Society cannot prevent them. It is only in connexion with selling poisons that they can step in; and surely poisons are so few, that no one need care; either do as they do in France or send it by post, or, if a good customer, make them a present of it. As sulphocyanide is not a scheduled poison, there is only the mercury bichloride to trouble them, and by putting up the uranium intensifier it will not be needed.

From all sides this year has not been a very good one for photographic dealers, and my advice is not to cut down prices to the same level as the chemists but to make themselves thorough masters of their business, try everything thoroughly, be able to answer every question, and he need not fear the poison law or any other monopoly.—I am, yours, &c.,

MEDICO.

TAKING PHOTOGRAPHS FOR NOTHING.

To the EDITORS.

GENTLEMEN,—It is more than probable that the firm of diarists will have changed their opinions before this respecting the views of "the leading photographers of the kingdom," judging by the correspondence that has appeared in the pages of our (professional) JOURNAL, aided too by the influence of our Editor, who, in answer to a correspondent a few issues back (August 14), plainly told him that competitions had no place in his JOURNAL. Thus, much good, I hope, will unwittingly accrue from the firm's action, and that these unhealthy schemes will receive a "scotch" which may eventually evolute to their death. To this end, for some time past, I have placed my orders only with such firms as hold aloof from free coupons and "prizes" to users of our material schemes. So, consonant therewith, I declined the firm's offer with an indignation felt, if not expressed, and shall still practise and endeavour, as of yore, to disseminate the leaven of my views, and so another name is engraved within "the book and volume of my brain."—I am, yours, &c., W. BARRY,

President National Association of Professional Photographers.

September 14, 1896.

AN ANTI-HALATION SECRET.

To the EDITORS.

GENTLEMEN,—Place two thickly coated plates together in single slide, both with their films facing the lens, so that the back film may receive the superfluous light its front neighbour can well spare. This is a secret worth —— at least.—I am, yours, &c., ANTIHUMBUG.

ABOLISH THE PATENT LAWS.

To the EDITORS.

GENTLEMEN,—There is a beautiful simplicity about your correspondent's letter under the above heading in your last issue, his reference "to the existence of a higher intelligence" being an excellent argument in favour of permitting every one to avail himself of—or, in plain Anglo-Saxon, steal—the fruits of another man's labour. Your correspondent might go a little further and apply the same argument to literature and painting—why should not any one be allowed to copy any work that he has a mind to? There is, however, a great difference between the laws of this country, as relating to literature and painting (including photographs), and those relating to inventions. The law of copyright, although not perfect, is comparatively simple; whereas, after an inventor has obtained an English patent, he finds that he has published his ideas to the world through the Patent Office, and all he has gained is the privilege to enter an expensive law suit against infringers. Your correspondent, however, may take heart, for, "owing to the existence of a higher intelligence," there are thousands of harpies and thieves dodging around to see how much of other people's ideas they can appropriate and yet keep outside the law's grasp. You may, by sharp practices, steal another man's brains to any extent you like; but, if a starving beggar stole a piece of bread, the law in all its majesty would be down on him.

It might interest your correspondent, and some of your readers, to hear some of my experiences in connexion with "animated photography." I do not profess to be the original inventor of animated photographs, because it is exceedingly difficult to know what the other men have thought of; but I do know that, twenty-five years ago, I made wheel-of-life pictures *drawn* partly from photographs, and I tried to make them by photography purely; but, as I could only get twelve pictures at that time, the incident lasted only a second or two. I dropped the matter for a number of years, and then the work of Muybridge gave me a renewed interest in it. In 1893 you will find that I took out a patent for an apparatus for taking and showing pictures in rapid succession. I also successfully photographed the Oxford and Cambridge boat race in 1895, also the Derby of that year, and I think I am quite safe in the assertion that I was the first to successfully take such photographs. But to come to the object of my letter. In order to develop and print these long bands of photographs, special means had to be adopted. I had to find out how, and did so. I took into my employ men who knew no more about the subject than my boot knows, I taught them everything they knew, and, as business increased, I took on other assistants, having to teach them also. Business called me away for a week or two, and I learned afterwards that a youth had been a constant visitor in my absence, and, by a curious coincidence, on the discontinuance of these visits, others learned how to produce these pictures. The private address of one of my assistants was also discovered, and he was called upon, about eleven o'clock one night, and an offer of employment made to him. Comment is needless.

I might publish a great deal more in the same strain, but I feel I must not trespass on your valuable space further. I only wish to warn other inventors to be very careful to properly protect their inventions before allowing any one to see their models and drawings, and, if possible, to keep the various branches of their work apart. *Verb. sap.*

I am yours, &c., BIRT ACRES.

SUNDIALS.

To the EDITORS.

GENTLEMEN,—I should be very much obliged if any reader who has a photograph of a sundial—or a print in which a sundial forms any considerable portion of the picture, would favour me with a copy, in return for which I shall be pleased to exchange other prints. Thanking in advance any reader who may so oblige,—I am, yours, &c.

Stanmore-road, Birmingham. E. C. MIDDLETON.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

RECEIVED.—JAQUES; J. A. T.; and others. In our next.

ADDRESS WANTED.—A. GAUNT. The address is—Care of the Gem Dry Plate Company, Villiers-road, Willesden Green, London, N.W.

SPOTS ON PRINTS.—H. SHOEBRIDGE. You must give us fuller particulars as to the mountant employed, method of washing, &c., before we can hazard an opinion.

FREE-PORTRAIT SCHEMES.—R. W. HOWES. We have frequently referred in these pages to these free-portrait schemes, which could not live if the public were not so gullible.

PHOTOGRAPHING IN HYDE PARK.—C. STUART says: "Would you inform me how I can get permission to photograph in Hyde Park?"—In reply: Apply to the Secretary, Her Majesty's Office of Works, Whitehall, S.W., enclosing a stamped envelope.

EMPLOYER AND ASSISTANT.—PRINTER. No specified time, whether months or years, will entitle you to "compel" your late employer to give you a reference. Giving a character is quite optional on the part of an employer, though it is seldom refused.

WASHING TROUGH.—T. WILKINS. Metal vessels, unless they are enamelled or japanned, are not to be recommended for washing prints. Enamelled iron dishes are not good for silver solutions, because the enamel is seldom so perfect that the silver will not find its way to the baser metal.

GERMAN CUSTOMS HOUSE.—C. X. If the boxes are labelled photographic plates, and you explain that they will be spoilt if exposed to light, you will have no difficulty in getting them through the German Customs House—less, indeed, than you may perhaps experience in getting them through the English Customs on your return home.

PORTRAIT LENS FOR LANDSCAPES.—C. BENTON. You have made a mistake, the back lens of a portrait combination is of no use for landscape work. It is the front combination that must be used for that purpose. The function of the back lens of the Petzval form of instrument is to correct the errors of the front one, so that the combination can be worked with a large aperture.

TO PRESERVE GELATINE.—VERDES says: "Will you be so good as to inform me how to preserve gelatine for optical mounting? A recent preparation of mine became quite bad in ten days' time, and I am at a loss to know what to add to it that will not damage the print."—In reply: The addition of a little glycerine and methylated spirit to the gelatine when dissolved will probably answer.

ELECTROTYPING.—T. WARNER. The form of battery most in use by practical electrotypers for depositing copper when a dynamo is not available is the Smee form. It is found more economical in working, and more convenient to deal with than the Daniel battery. The Grove or Bunsen is better suited for steel facing than for depositing copper. For that purpose either is better than the Smee form.

MOUNTS.—T. WALTON says: "I have been told that prints mounted on chocolate mounts are sure to fade. Recently I heard that these mounts were the safest of all to use. Can you give me any idea which is right?"—Either may be right, or either may be wrong. "Chocolate mounts" are not always surfaced with the same pigment.

S. N. J.—We have carefully read your letter, and are sorry we may not print it, as it might have elicited a number of interesting opinions. We fear you have no legal remedy, although, under the circumstances, it is decidedly galling to have a slur cast on the quality of your work. We should advise you to take no notice of the matter. Please send us the name of the paper—if possible, a copy—as we should like to make a reference to the subject.

A RATING QUESTION.—IN DOUBT.—If the studio is a "converted caravan on wheels," standing in the garden, we should say it is not rateable—that is, if it is a *bonâ-fide* vehicle which can be taken from place to place. If, however, it is permanently placed in the garden, from which it cannot be moved without disturbing a fence or wall, and is used for business purposes as a photographic studio, the case may be different, and, as the parish authorities assert, subject to rate.

LEMANE'S PHOTO-ENGRAVING.—C. R. CHAPLIN says: "Kindly inform me where I can obtain the book mentioned by you in this week's issue, *Photo-engraving Made Easy*, by Lemane, and price of same."—In reply: As stated in our review of the book, it is published by Messrs. Harrington & Co., Sydney, New South Wales, price 1*s.* It is a long way to send, so you had better buy Verfasser's book, published by Messrs. Percy Lund & Co., Amen-corner, E.C.

STUDIO AND BLINDS.—S. B. The form of studio as shown in the sketch cannot be patented, neither can the blinds be, as both are old. The studio formed the subject of a patent by Mr. Van der Weyde many years ago, and the louvre form of blinds or screens is still older. It is true that you can patent the studio the same as one can anything else, but the patent would be invalid. There would be no legal obstacle to any one constructing a similar studio and fitting it with the same kind of blinds if they chose, but it is doubtful if any one would desire to do so.

NEGATIVES BROKEN IN TRANSIT.—A. W. & Co. We are afraid you will now get no compensation. As the enlargers say they were properly packed when they dispatched them, they will, of course, deny responsibility. As your reception-room attendant could hear broken glass in the package when it was delivered, she should not have accepted it or signed for it except as received damaged. As it is, the receipt implies that the parcel was received in good condition. As a fortnight has elapsed, and no complaint made, we expect the railway company will now entertain no application for compensation.

FORMALIN FOR HARDENING PRINTS.—J. L. CLARKE says: "Referring to your article of April 16, 1895, on formalin as applied to negatives, would you mind telling me, in your Answers to Correspondents, whether formol is a better substitute for alum for hardening prints—whether, after the final washing, the application of formol would produce any deleterious compounds likely to injure the conservation of the prints?"—In reply: We have no practical experience of formalin for the purpose named, but *theoretically* it is to be preferred to alum. You would require to employ it in a very dilute state. We do not think it would create any deleterious compounds likely to injuriously affect the prints.

AIR BUBBLES IN LENSES.—A. BLAIR writes: "A friend of mine, while in Germany a few weeks ago, bought a lens made with the new Jena glass, but it has several small bubbles in it. The makers assured him that the bubbles would make no difference in the working of the lens; but surely they must. Does this not show that the Germans do not mind what they sell so long as they get the money?"—The air bells will, as the makers said, make no practical difference in the performance of the lens. With some kinds of the Jena glass it is impossible to get it free from air bells; consequently lenses made with it, whether in England, France, or America, have them, but they do no harm. Can you, or your friend, find any ill effects from them?

UNMOUNTING GELATINE PRINTS.—M. P. says: "I should feel very greatly obliged if you would kindly advise me concerning the following matter: I have mounted a very highly glazed print. Whether gelatine surface (which I think it is) or some kind of printing-out paper I do not know, but in drying it has "rucked up," and therefore is useless for copying, for which purpose it was mounted. In mounting, ordinary starch was used, and was mounted dry, great care being exercised. I was afraid to rub it down between blotting-paper as in silver prints. It is a very valuable print, and cannot be replaced, and I want to know, first, How can it be removed from the mount with safety? secondly, how should it be remounted?"—In reply: 1. So recently as August 14 (see the JOURNAL of that date, page 523) two methods of unmounting gelatine prints were given. We refer you to that number. 2. To mount, squeegee down to remove the cockling, and then proceed to mount in the ordinary way.

TELLING THE COLOUR OF AN ORIGINAL FROM THE NEGATIVE.—J. W. BENNETO says: "I notice in your reply to a correspondent last week, who asks 'if it is possible to tell the colours of an original from the examination of the negative only,' you state 'it is generally possible to do so.' This reply has caused me a considerable amount of surprise, for, after nearly twenty years' experience of photography, obtained in London studios and elsewhere, I am unable to do so. Now, as you say it is possible to do so, I have this day, in the presence of four gentlemen, taken a negative on an orthochromatic plate (Lumière's Series A) of twelve colours on a white card, each colour numbered, and which I herewith send you, and ask you if you will be good enough to name these colours from the examination of the negative only, and, should you do so, I will forward you one guinea for your trouble. The coloured card has been sealed up in the presence of the four gentlemen, and will not be seen or handled by any one until after your reply, which I should be pleased to see through your columns if this is agreeable to yourself. The negative was taken through a yellow screen."—In reply: We adhere to our opinion that, "*generally* speaking, it is possible" for a photographer to tell the colour of an original from an inspection of the negative. Whether we, or any individual, could do so in a *particular* instance is another matter. It is *possible* to take photographs in natural colours (*vide* Lippmann's process), but experience shows that it is enormously difficult to repeat his results—or devise another process. As to Mr. Bennetto's offer of 1*l.* 1*s.*, we should hardly have thought it necessary to remind him that neither our position nor our inclination would permit us to avail ourselves of it.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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OUR FORTHCOMING ALMANAC.

The time of year has arrived when it is necessary for us to take in hand the preparation of The British Journal Photographic Almanac for 1897. A feature of the volume for the past thirty years has been the co-operation of numerous friends and readers of the Journal, and the Editor takes the opportunity to express the hope that the support so kindly placed at the disposal of his predecessors may be continued to him.

We especially invite contributions on topics of practical interest, and should feel obliged if the articles and any accompanying sketches are sent to us at the earliest possible date.

Secretaries of Societies, and especially of those established since the appearance of the last Almanac, will oblige us by forwarding lists of officers and other details for inclusion in the Directory of Photographic Societies, in order that the list may be made as complete as possible.

The Publishers wish us to remind intending advertisers that the announcement pages of the Almanac are already filling rapidly, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

Mr. C. E. Corke, photographer, writes us in reference to some comments made on his work by a non-photographic contemporary: "I have a series of registered photographs, 12 × 10, of Knole, near Sevenoaks, and also the exclusive right, granted me by the owner, to take photographs of it. About three weeks ago a gentleman called on me to know if I would allow any to be published in the *Builder*. I told him my terms, &c. He then asked me to send a selection to the editor for him to choose from. I did so, and he retained two, and sent me postal orders for two guineas, the fee I asked, at the same time requesting me to sign a printed receipt, which he sent. I wrote him by return of post, acknowledging the receipt, but at the same time asking him for a letter agreeing to my conditions (which I had told to his agent), *i.e.* that the photographs were only to be used for the special purpose, and no other reproductions made, unless for reprints of the whole of the paper they were in. At the same time I stated that, if he refused my terms, and would return the photographs, I would return the two guineas.

* * *

"I received no answer to this letter, and after a week wrote again, asking for the same. Before an answer came a friend of mine brought me the paper in question, with the two views reproduced in process, and my name under them. But imagine my surprise when in the letterpress respecting them appeared the following: 'Unfortunately, even photography has been restricted to a local photographer, who exercises a monopoly, and whose photographs are very inferior to what we could have obtained if we had been at liberty to have our own photographs specially made.'"

* * *

We have before us silver prints of the negatives, and they strike us as being very good, and hardly deserving to be termed inferior, whatever the photographic abilities at the service of the *Builder* may be. Mr. Corke has all the more reason to complain of his work being condemned by our contemporary, inasmuch as he informs us that he did not submit it for reproduction, and, in fact, would have preferred not to have had his photographs utilised. We are confident that our professional readers will sympathise with Mr. Corke, whose admirable work has frequently earned commendation in these pages. Mr Corke makes the suggestion that in future, when photo

graphers are permitting their photographs to be reproduced by the illustrated press, there should be a stipulation protecting them from adverse criticism. But such a stipulation is, it may be hoped, unnecessary in the majority of cases.

* * *

The many friends of Mr. Alexander Cowan will be glad to hear that he is rapidly recovering from the accident he met with a few months ago. Mr. Cowan had the misfortune to have his leg broken through being knocked down by a hansom, and he was for some time prevented from attending to business. He is now able to get about, and in a short time expects to be completely well.

* * *

Acetylene for evening portraiture, or for use when lack of natural light in the studio obliges photographers to resort to artificial illumination, should be borne in mind by photographers as likely to prove extremely serviceable. At a recent meeting of a London photographic society photographs of good quality were shown that had been taken under very simple conditions. Twelve acetylene jets in the form of a ring, about a foot in diameter, the supply of gas coming from one generator, were utilised as the source of light, and placed within about seven or eight feet of the sitters. Fully exposed results of good quality were obtained in four seconds, using Ilford special rapid plates, and with a lens aperture of *f*-8. It would perhaps be preferable to split up this light, so as to make more than one source, and also to use some means of softening or diffusing it, as our experience shows that the bright flame given by acetylene is painful to the eyes. At any rate we commend the subject as well worth the attention of practical photographers.

* * *

We have been sent a copy of the *Western Mail*, which we observe makes an "extraordinary offer" to its readers. It undertakes to supply three-quarter life-size "crayon and Indian ink portraits" for six shillings and sixpence. A price-list of frames is also appended. The usual statement is made, that "these pictures, if ordered through artists in the ordinary way, would cost from two to three guineas." If that be so, we are sorry the *Western Mail* does not seize the opportunity of obtaining the market price for its enlargements.

* * *

We made allusion some months since to a London studio in which a system of foot lights was adopted for imparting to photographs of actresses the appearance of having been taken on the stage. Messrs. Langfier, of Glasgow, whose new and handsomely fitted studio was recently opened in that city, have extended this idea, and have provided a completely fitted stage, which is to be used for photographing theatrical subjects. It has a handsome proscenium, and sets of scenery, and is illuminated by incandescent lamps of an aggregate of 12,000 candle power. We congratulate Messrs. Langfier on their enterprise.

PANORAMIC PHOTOGRAPHS TAKEN IN SECTIONS.

Panoramic photography formed an interesting theme for discussion at a recent meeting of the Photographic Club, when one of the members showed some panoramas, each composed of four or five separate negatives. Now, nothing seems much simpler than to take a series, say, half-a-dozen negatives of a scene, print them, and then mount them in juxtaposition, to obtain a panorama including any desired angle. But, simple as it seems, as many know who have tried it in practice, it is by no means an easy matter to get half a dozen prints from as many different negatives of the same depth and tone, so that, when they are joined together, the junctions do not show more or less conspicuously—the former rather than the latter. Still the thing is possible, and many very satisfactory results have from time to time been produced in that way, and in very large sizes too.

One of the things which is, generally, very noticeable in joined panoramas, unless the negatives are taken with tolerably long-focus lenses for the size of plates used, is that the prints are darker at the margins than they are in the centres. Hence, when the prints are joined, there are alternate dark and light places throughout the length of the picture. The dark portions at the edges are due to the unequal illumination of the field of the lens, sometimes added to by inequality of the film at the edges of the plates. We shall not here discuss the question of panoramic and plane perspective, but give a few practical hints on the production of panoramas in sections.

One of the essentials to success is that the camera be planted perfectly level; another is that it can be freely rotated on its stand by loosening the screw, or by the turntable if it has one; and the centre of rotation should be as nearly as possible under the optical centre of the lens. On no account should the camera be otherwise moved between the exposures. The negatives should be taken quickly, one after the other, so as to secure equal lighting in all, and it is unnecessary to say that the same exposure must be given in each case. In arranging the camera for the different sections, a good margin should be allowed on each negative—that is, each should contain at either end a good amount of the subject of the next one. By this means the dark portions just alluded to may be discarded and only the best portions utilised. In this way the joins of half a dozen pictures can be more easily hidden than could four or five if nearly the whole of each were included. Before the camera is moved, after the negatives have been taken, it will be well to mark the spot, so that it can be replaced exactly where it was before in the event of any of the negatives turning out unsatisfactory. If it should happen that any have to be retaken, it is obvious that the same time of day must be chosen, otherwise the lights and shadows will not agree with those in the other pictures.

In the development of the negatives they must be made as nearly as possible of the same density and of the same character, *i.e.*, developed under the same conditions, or prints of similar tones will not be obtained. The prints may be made on any of the papers, but generally the most uniform results will be obtained on a printing-out paper, albumen by preference. The prints should be carefully printed to the same depth, and all toned in the same bath. The examination of the prints during the printing should be done in the dark room, and they should not be exposed to white light while toning, as even the slightest tint on the sky of one will prevent its matching the others when finished. It is very important that the paper for all the prints should be cut in the same direction from the sheets; otherwise, in mounting, when the prints are wetted with the mountant, they will be of different dimensions. The best way of trimming the prints, each of which contains some of the subject of its neighbours, is to accurately superimpose the duplicated portions, the one on

the other, and then cut through the two papers with a sharp knife. In this way perfect junctions are secured without further trouble. In some instances it is better to make the cut other than straight through the subject; but, as a rule, a straight cut through the sky itself is preferable.

The junctures in the sky are always more difficult to hide than they are in other portions of the picture, particularly if it happens to contain natural clouds, or the negatives print through in the sky. For this reason the sky is often blocked out entirely in all the negatives, so that it prints perfectly white. It may, however, be toned in afterwards, though it is obvious that it cannot be done with each print separately. The way to do it is to arrange all the prints on a flat board, and then cover them with a piece of glass to keep them in position. The sky can then be tinted in shading it as desired. In this way a uniform tinting will be obtained on all the prints alike.

Building up a panoramic picture in sections, by mounting the prints in juxtaposition by "butting" the edges, is very troublesome, and is rarely entirely satisfactory, owing to the joins not being perfectly hidden, arising from a difference of the depth or tone of the various prints. It was pointed out at the Club meeting, however, while this matter was being discussed, that a satisfactory and easy method of producing panoramas was, instead of actually joining the prints in mounting, to leave a small space between them according to the size of the pictures. In this way any slight discrepancy in depth or tone passes unnoticed, and, when the panorama is viewed from a distance, it appears as a continuous picture; and, when looked at closely, each section can be seen as a separate picture.

There are other ways of producing panoramas in sections, by which the joins may be more completely hidden than is possible in joining the finished prints, but space will not permit of a description of them in the present article.

The Recent Eclipse.—It is evident that we shall not be, as was at first thought would be the case, without good photographs of the recent eclipse, for the Russian observations, according to M. Tissorand, whose authority was M. Buckland, the Director of the Pulkowa Observatory, have met with a fair share of success, a number of successful photographs of the corona having been taken. Up to a very short time before the eclipse the sky was covered with clouds, but they cleared up sufficiently to enable good results to be obtained.

The Blue Sun.—So much doubt has been thrown on the existence of this phenomenon that it is a pity some hand-camera worker should not endeavour to secure a snap-shot on the occasions when it is observed, for, though, of course, the colour would not be seen, some of the attendant phenomena would be recorded, which would tend to confirm the actual existence of the effect, and possibly to throw light upon its cause. We are led to making these remarks through noticing the account, by Professor H. Mohn, of a recent observation of the phenomenon by Captain Salveson, of the Royal Norwegian Navy, who states that he recently saw the "blue sun" off the west coast of Norway at sunset. The sun at the time was quite clear. "It is curious," says *Nature*, "that this beautiful sight is so rarely looked for."

Gold Decoration.—Although the plan of printing of photographic mounts in bronze (or, as it is called, "gold") ink is fortunately far less adopted than once was the case, we are sorry to find it is not entirely banished from the studios of some photographers. It is true that special pains are taken, now the danger of the bronze is known to ensure the absence of any trace of powder from the surfaces of the mount, but it is not possible to entirely free the card from the deleterious substance, the mere packing and handling is sufficient to detach portions of the bronze, when, as every one ought to know, the print entirely loses its colour at each spot where a particle of the bronze touches. The best way to prove the existence of this danger is to mount a print on the back of a mount printed in gold and leave it in a damp place. In a week or two the name or design so printed will make its appearance in white, the metal having acted right through the paper on to the printed photograph.

Still, a little gold bronze for decorative purposes on photograph frames and otherwise is permissible, and some notes on the plans usually adopted for utilising the bronzes or gold powder, as they are so often termed, will be useful. This bronze can be had of a large variety of shades—gold colour from the palest yellow to the deepest gold tint, green bronze of various tints, and bronze of silver colour. Where no weathering is likely, a water vehicle is used; a mixture of dextrine and water of suitable consistency, to which has been added twenty-five per cent. of bichromate of potassium, is employed; about five times as much dextrine as bronze is needed. Dilute solution of water glass is also made use of where more permanent work is needed. Solution of shellac with borax is also used, an addition of one-half its bulk of spirit being found advantageous. We read, too, the following instructions, which, however, we think neither logical nor likely to be useful: Dissolve dammar in benzole, and neutralise with solution of potash by shaking together, and allowing to "separate." But, of all the gold paints ever brought forward and sold, the most popular is the "permanent gold paint," that has been an article of commerce for some time past. We have seen no formulæ published as to its mode of manufacture, but a close examination suggests to us that it is composed of gold bronze of a real gold shade, mixed with a solution of celluloid in amyl-acetate. Our readers may thus find a new use for the support in old-film negatives.

Are Röntgen Rays Material Particles? — Physicists are observing great caution in making any pronouncement as to what the Röntgen rays really are. For example, Professor Thompson, President of the Physical Section of the British Association, in his inaugural address, says: "We are not acquainted with any crucial experiment which shows unmistakably that these rays are waves of transverse vibration in the ether, or that they are waves of normal vibration, or, indeed, that they are vibrations at all. The two ways in which Röntgen rays differ from light is the absence of refraction, and perhaps of polarisation." But M. Tesla, whose coil is well known, and who is an authority of high value, gives his opinion without reserve. He thinks they are not vibrations, but are actual particles emitted in a somewhat similar manner to that predicated by the Newtonian theory of light. He witnesses that he can actually feel the effects of these material particles striking against his eye, and has noted the sensation he experiences when they come in contact with his brain. "There is little doubt now," he says, "that a cathodic stream within a bulb is composed of small particles of matter thrown off at great velocity from the electrode. . . . . But surely matter proceeding with such great velocity must penetrate great thicknesses of the obstruction in its path, if the laws of mechanical impact are at all applicable to a cathodic stream. . . . . I would not doubt that some matter is projected through the thin wall of the vacuum tube. The exit from the latter is, however, the more likely to occur, as the lumps of matter must be shattered into still smaller particles by the impact. From my experiments it appears that the lumps or molecules are indeed shattered into fragments, or constituenta so small as to make them lose entirely some physical properties possessed before the impact."

THE TREATMENT OF OVER-EXPOSED PRINTS.

One of the greatest troubles in these days of rapid printing paper is the avoidance of over-printing when only a moderate number of printing frames have to be watched. In the old days of collodion

negatives, especially with pyro development, the general density was so great that, even in strong sunshine, an oversight of several minutes made very little difference, comparatively speaking, in the quality of the finished print; but now, with thinner negatives and vastly more delicate gradations, as well as much more rapid paper, a few seconds will often make all the difference between a good print and an inferior one, and, unless the very greatest care is taken, the loss from over-exposed prints forms a very serious item in the modern photographer's calculations.

Many have been the remedies proposed; but, although it is a very easy matter to simply reduce the prints, it is almost invariably at the expense of the tone. Treatment of the proof before toning nearly always exerts an injurious influence on the subsequent action of the gold solution; while, on the other hand, if the remedy be applied after toning to the image, composed partly of gold and partly of silver, the colour is altered in consequence of the removal of the metals in unequal proportions. Thus, if the silver be dissolved in larger proportion than the gold, as is usually the case, a bluer tone results, and the reverse is the case when the superficial layer of gold is attacked. How extremely small a proportion of the toned image consists of gold is proved by the simple experiment of bleaching a toned print with mercuric chloride, by which means the silver it contains is converted into chloride, and thereby rendered invisible, while the gold remains as an extremely faint stain, barely sufficient, in many cases, to indicate an image at all. The experiment shows, in fact, how delicate a matter it is to interfere in any way with a finished image, whose tone depends entirely upon the due proportionment of its metallic constituents.

In cases of very or comparatively slight over-printing the simple device of treating the proofs with a moderately strong solution of salt will often have the desired effect so far as reduction is concerned; and, although this treatment to some extent interferes with the subsequent action of the toning bath, and probably renders it impossible to secure the highest quality of result, it can at least be said that the colour ultimately attained can be relied upon as permanent. But this method is only available in very slight cases. Where the over-printing has been considerable, the only methods of any use are those applied after toning, and these consist, to mention only one or two examples, in submitting the proofs to the action of a weak solution of cyanide of potassium for a short time, or until the desired reduction has taken place, or to a prolonged immersion in the ordinary hypo fixing bath. The former acts probably upon both the gold and silver composing the image, and the gold, being not only present in much smaller quantity than the silver, and forming, moreover, a merely superficial layer, is acted upon or dissolved in larger proportion than the latter, with the result that the colour of the print becomes much browner, and partakes more of the unpleasant tone of one containing no gold.

There is one other method which may be mentioned, and which is applicable only to prints after fixing, whether they be toned or not. Probably for a reason we shall mention, the omission of toning previous to treatment is an advantage in this case. This plan consists in bleaching the image or converting it into chloride of silver by any of the usual methods, and subsequently redeveloping it with hydroquinone, metol, amidol, or other of the developers not prone to stain the paper or film. This, although a somewhat troublesome plan, is the most scientifically correct in principle, as, without losing the minutest detail in the high lights, the shadows can be brought to any degree of depth desired. In other words, the excessive deposit produced by the over-action of direct light can be reduced by simply arresting development at the right point.

It will be observed that the formation of the redeveloped image does not depend upon the graduated action of light upon a layer of chloride of silver of uniform thickness, but upon the total or partial reduction of such a layer, varying in thickness according to the gradation of the picture. Consequently the high lights or finest gradations, instead of being the last to appear as in the development of an ordinary positive, commence to appear simultaneously with the deepest shadows; and, as the action of the developer penetrates gradually into the film, the whole or only a portion of the silver chloride present may be reduced as seems desirable, and the action can be stopped when the image has acquired the correct strength, any unreduced chloride being removed by a second fixation.

When this process is applied to a previously toned print, there is a curiously strong tendency for the redeveloped image to revert to the same tone as the original one. It might be supposed, when, say, amidol is employed, a developer which, under ordinary circumstances, gives pure black tones, that under any circumstances the redeveloped image would be black, whatever its original colour; and, though this may be sometimes the case, the reason is not very clear, and certainly in most instances it is as we have stated, the original tone is reproduced; as it is seldom or never possible to secure a good tone, or to judge what the colour would be when reduced in cases of over-printing, it seems therefore desirable to dispense with toning altogether before treatment, and to perform that operation afterwards, when a permanent and reliable result is possible of attainment.

This is more especially so since the introduction of the practice of development of partially exposed printing-out papers, for here, as is well known, the image can be developed to any depth, of a colour exactly, or at any rate closely, resembling that produced by direct printing, and, most important of all, capable of being toned in precisely the same manner as if printed out in the usual way. Similarly, if an over-exposed print be washed and fixed without toning, bleached, and redeveloped with a solution of hydroquinone containing a large proportion of bromide, the action can be stopped at any desired stage, and the image is then, after due washing, capable of being toned in the usual toning bath along with other prints produced in the ordinary way. W. B. Bolton.

(To be continued.)

THE PHOTOGRAPHIC SALON.

There was once a king who, having satiated himself with all the pleasures at his disposal, fell to sighing for a new one. The gratification of that pampered monarch's wish could not possibly have afforded him more delight than we have experienced at the opening of the Fourth Annual Exhibition of the Photographic Salon. Great, however, as is our pleasure, we feel it difficult to say whether that particular sensation is not eclipsed by one of simple amusement. "Each thinks," said a poetess who flourished earlier in the century, "his little set the world." At this moment there are a number of gentlemen who strike us as honestly believing that the radius of the circle of photographic art is drawn from a centre which is to be found at the Dudley Gallery, Piccadilly; but the dividing line between an honest belief and a delusion is notoriously difficult to determine, and we may therefore be pardoned if, in the present case, we also shirk a task that might baffle abler persons than we pretend to be—nay, even an art critic.

It is far easier for us to explain why we are both pleased and amused that the Salon is once more with us. We are pleased, because we know that in expecting to see some good photographs we shall not be disappointed; we are amused at the trumpet blowing that has preceded the opening of the Exhibition; we are amused, by anticipation, at the more or less harmonious orchestral performances that are certain to follow it. After the lapse of three years from the establishment of the Salon, there would appear to be in the minds of certain literary members of the Linked Ring so much doubt as to whether the photographic public has yet risen to appreciate the Salon as highly as they think it should be appreciated, that recently they very laboriously endeavoured to convince their readers that the Salon Exhibition *was* devoted to the exploitation of "pictorial" photographs. As nobody, so far as we know, has lately made any allegation to the contrary, we presume that these pronouncements were designed to be so many advertisements, which would not have been printed had they not have been badly needed. There is, in fact, great danger of the Salon being taken seriously now that the fever of novelty has abated, and it becomes more and more difficult to hang or to find photographic eccentricities, which in themselves constitute so many cheaply obtained inducements to a guileless public to disgorge its shillings and sixpences for the purpose of securing a hearty laugh.

As to the amusement which we are tolerably confident awaits us in the immediate future, it is perhaps needless to say that we shall derive it from the writings of the professional art critics who, as past experience tells us, usually treat a photographic exhibition with contempt, in-

tensified by ignorance and prejudice, unless paid or cajoled to do otherwise. These gentry differ among themselves with splendid independence when writing of the Salon or any other photographic exhibition, and it is safe to say that nobody gets any profit from the *mêlée* save plain persons like ourselves, who thereby learn how far to trust to the judgment of those whose qualifications to pass one may safely be said to exist almost altogether "on trust."

But for all that, this year's Salon Exhibition is one that no photographer can visit without gain as well as pleasure. It is a magnificent display of between three and four hundred beautiful products of the lens and the dry plate. It is true that, so far as originality is concerned, about eighty per cent. of the pictures hung should have justly joined the great army of the rejected, inasmuch as we saw them, or something very like them, last year and the year before; but, as there are four walls to be covered, it would be churlish to grudge the committee of the Salon whatever "padding" was found necessary in order to make the display "pan out" to the money's worth. Thus they temporarily serve a useful purpose, and, having done so, will, like their predecessors, pass into oblivion, as to the certainty of which there is no doubt at all.

There are, we think, two respects in which this Exhibition may be allowed to rank as the best of the series. The portraits are better than hitherto; and the "figure" studies, to use an intelligible if unsatisfactory term, are extraordinarily fine. What is here shown in these two branches of work would be difficult to surpass, and is well worth careful study. The landscapes, the river scapes, and the seascapes, the cattle pieces, &c., are pretty much what we have seen before; the nude is not conspicuous, and is consequently inoffensive; the frames are in good taste, and the effect on our minds, after a careful and lengthened study of the Exhibition, is, that collectively it is possibly the finest show of (pictorial) photographs so far got together. We probably said something like this last year, and now, as then, the admission is not made without a feeling of melancholy that, in two or three months' time, probably not a score of these photographs will be remembered by anybody but their producers. In previous years a feature of the Salon has been the inclusion of a number of works of which, as the popular phrase goes, you could not make head or tail; formless blurs, out-of-focus and foggy smudges, that provoked ridicule and pity. Well, ridicule has once more killed, and the Salon this year hardly contains a single exhibit of a pronouncedly "Salonic" character.

The prominence and the number of foreign exhibitors gives the Exhibition a quite international character, and it is with the work of one or two of these same foreigners that we ourselves are most pleased, and to which our note book contains proportionately more references than to that of native photographers. The unreadiness of the catalogue and the confusion of names, numbers, and titles at the time of our visit obliges us to give on this occasion a somewhat shorter notice to the pictures than hitherto, and it is therefore impossible for us to do more than take a brief glance at what struck us as the leading features of the display.

The little figure studies of Le Bègue that hang at the near left angle of the gallery as one enters are truly delightful in ease and grace of posing, and in delicacy of lighting. His *Etude du Nu*, a nude woman turned from the spectator, with outstretched hands against a screen, is almost faultless in modelling. *L'Attente* and *Etude Plein Air*, the one a fully draped female figure in the open, with her hand to her face in an attitude of expectation, the other a partly draped study, are good examples of this worker's felicity in choosing simple themes and successfully treating them.

Mr. Davison has enabled us this year to understand him somewhat at last. His *Rain, Steam, and Iron*, a glimpse of, if we mistake not, Hungerford Bridge in a rain storm, looking north, is, if very "impressionistic," realistic enough to be convincing and understandable. It is a "Whistlerian" effort, and will probably delight Mr. Davison's admirers. *O'er the Lea* shows Mr. Davison in another mood. It is a really beautiful study of cattle passing leisurely through an open gate, a lovely stretch of country upland forming the background. The effect is soft, unforced, and natural. *Decayed Staithe*, a bold waterside view, and *In an Osier Country*, in a somewhat similar style of work, and in a yellowish-brown tone, apparently on canvas, are examples of Mr. Davison's "scene-painting" like manner.

We note a little view called *A Telegraph Pole* by Mr. Lionel C. Bennett. The pole stands by the side of a reed-fringed river, and it does not appear to have moved during the exposure. Our Correspondence columns are open to Mr. Bennett if he cares to explain why he hath done this thing. *The Mall*, by Mr. Calland, is a pleasing example of this gentleman's skill in securing happy effects of light and shade in an ordinary London thoroughfare, as witness his last year's *Brompton Road*. Dr. Henneberg shows a beautiful view, the composition of which we very much admired It depicts a *Village in Pomerania*, a small group of old houses embosomed in trees. Brown carbon appears to be the printing medium, and the picture is one of the most pleasing, because the most natural, bits of landscape hung here.

There are several specimens of "bichromated gum" printing that do not flatter the process, the effects obtained being coarse, crude, and wanting in delicacy, and we pass on to remind Mr. L. Cohen that, when he next photographs a young person showing her teeth, it is ungallant to make them appear larger than their natural size. His *Study of a Head* sins in this respect. We note, for the first time, the name of Mr. W. A. Locks at the Salon. He shows a very clever piece of work, *Daughters of the Soil*, depicting two (? gipsy) women in a field seated by a kettle suspended from a tripod over a fire. It is a clever, glowing bit of work, the grouping and figures being lifelike, the landscape real-looking and harmonious. We hope Mr. Locks will give us more of this kind of work. Mr. W. Dawes shows a crisp and brightly rendered study of a thistle bank, but Mr. Dawes, who is far from a novice at pictorial photography, should endeavour to cultivate a little originality. This is one of Mr. Davison's cast-off subjects. Watzek's large and effective imitation crayon, *Baumstudie*, will probably please many who like this photographer's singularly delicate work. Of Mr. Maskell's three portraits: Mr. Corbould, Mr. Davison (the best likeness of "G. D." that we have seen, the expression and attitude being extremely lifelike) we prefer the *Dutch Girl*, which, with all its apparent simplicity of style, is really a powerful bit of work. We are sadly disappointed with Mr. Edgar Lee's *Marshy Moorland*, a red-toned bit of landscape which betrays no evidence of being anything but just a hap-hazard photograph of an ordinary view.

Mr. E. R. Ashton's Eastern studies show all his old care and skill, but a photographer of Mr. Ashton's undoubted powers should make up his mind to try his hand on subjects other than those ready to hand. Much the same remark may be applied to Mr. Bhedwar's series *The Renunciation*, which, despite its wonderful photographic excellence will probably excite little interest here. The series tells of the gradual progress of the aspirant after spiritual perfection, and the *dramatis personæ* are drawn from the ranks of those Indian religious with whom Mr. Bhedwar has already several times made us acquainted.

The Village Choir is the name given by Mr. John E. Dumont to a photograph of two women and two men singing, with diversified expressions. It is an interesting and comedy-like study, and only narrowly misses being a very great success.

Of Mr. H. P. Robinson's contributions we much prefer *Returning to the Fold*. In the glow of darkening evening a flock of sheep is receding towards the distance. To our mind the effect of motion in the flock is well suggested, and, though the subject may not present as much difficulty as some of the others Mr. Robinson has taken in hand, we are more pleased with its sentiment and its effects. Have the Robinsonian female models all gone and got married, or struck for higher pay, that he thus entirely abandons them? Mr. Robinson's other pictures include some deftly executed seascapes, one, *A Breeze of Morning Moves*, being an attempt—and a very successful one—to depict a Scotch mist clearing off as a breeze approaches. But somehow we sigh as we look back to the vitality, the humanness, the *aplomb* of *Carolling*.

Mr. Horsley Hinton has accomplished the very difficult task of beating his last year's work. It is of the same style, but Mr. Hinton has thrown off the fetters that bound his selective powers, and this year gives them greater scope. Sameness of subject and style, that we noted in Mr. Hinton's work for years, no longer characterises it. Take, for instance, his *Requiem*—an old boat by a lonely river bank. It is a simple—you might almost say a commonplace—theme, and yet Mr. Hinton has imparted to his view an almost appreciable atmosphere of quiet and melancholy. *Sunshine and Rain*, another of his works, is a wonderfully effective rendering of rain beating down on a partly sunlit landscape. We should be surprised if this is not voted Mr. Hinton's best. *Tide-bereft*, a characteristic study of a dried-up waterway, is another admirable piece of work. Mr. Hinton has acquired a mastery of the platinum process, and one of his pictures has been cleverly toned so as resemble brown carbon.

We must compliment Mr. C. L. Emmanuel on the admirable transparency and light and shade of his little view, *The Terrace at Richmond*. Mr. J. Craig Annan, as usual, plays a strong hand. His *Sisters* (portraits of two ladies) is really a triumph of that art which conceals art, the poses being graceful, free, lifelike, and uncommon. A bit of work of this quality and power tells a photographer more in ten minutes' contemplation than libraries of art writings or any number of debates. But then Mr. Annan is a master craftsman to his finger tips, and, besides thinking

out his subjects, knows how to print and frame them. *The Church or the World* is his most ambitious attempt. The flower-decked girl on the pale steed, that is led by the black-cloaked dimly seen nuns, looks out to us, and asks, as it were, in her own mind that most momentous question, Which shall it be? She yearns perhaps for a life of piety and contemplation, but—oh, the price to be paid, and the sacrifice to be made! Mr. Annan's other subjects include an interior, *The Marble-cutter*, and a charming Venetian scene. His versatility is very great.

To our taste, and in our opinion, the work of M. Ch. Puyo is not far short of being the soundest and the cleverest in the Exhibition. Note the fine, the true effect of lamp light in the sleeping room, *Le Coucheur;* the astonishing force and naturalness of the laughing expression on the faces of the two women in *Gaieté!* Not merely is M. Puyo a master of delineating expression by means of photography, but his power of posing and grouping figures is assuredly the greatest we have met; his pictures are always faultlessly illuminated, his accessorial details correct to the minutest degree. Then what exquisite prints he gives us by the much-discussed Artigue process! To any photographer who desires to inspect some of the finest figure studies in ordinary rooms, M. Puyo's exhibits here, of which we have only mentioned two, should be invaluable as object-lessons.

M. Demachy sends some refined and thoughtful head studies on bichromated gum paper. We have only space to compliment Mr. Craigie, Mr. Hollyer, Mr. Van der Weyde, and Mr. W. Crooke on some very fine portrait work, differing in style and treatment, but all worth studying.

This short notice, the brevity and incompleteness of which is our misfortune and not our fault, by no means does justice to the Salon Exhibition. We may—and indeed we should like to—return it; but in the mean while we can honestly recommend our readers to go and inspect it. After all said and done, the Exhibition, like the play, is "the thing;" and, however much our friends of the Linked Ring may amuse or confuse us with their art writings and theories, they deserve the amplest recognition of the beauty and the variety of the collection of photographs they have just thrown open to the public.

EXHIBITIONS AND JUDGES.

Every year, as surely as September itself comes round, we begin to see in the press expressions of dissatisfaction with the awards made by the Judges at the Exhibition, and comments on the unsuitability of the gentlemen elected to the office. A.D. 1896 appears to be an exception to the rule however, as the criticism on this occasion has been made first, leaving the Judges to act up to it or not afterwards, as they may feel disposed. That this is the case can be seen by reference to the last issue of The British Journal of Photography, in which "Cosmos" deprecates the employment of "artists" and Mr. Maskell that of "painters" as Judges, the two terms being used as if they were synonymous by the two writers.

It is just in this fact that the gist of the whole matter is to be found, and the use of the term "artist" as applying chiefly if not exclusively to painters, might be made the text of an instructive, if humiliating, lesson to photographers. To "Cosmos's" criticism no possible exception can be taken. His objection is based on the experimental ground that they have been tried before and found wanting, and on the experience of past years he is not in favour of their employment at the same task again. This is, of course, a matter of opinion, but still of opinion formed by observation. Another writer, however, is opposed to the judgment of painters on what would be more correctly described as theoretical grounds, and gives at some length what may, I suppose, be regarded, bearing in mind that it proceeds from a high official of the body, the Linked Ring's aspect towards the question.

Like that of many theorisers, Mr. Maskell's position is hopelessly at variance with his published views on a kindred subject. When his object is to decry the sharply focussed, glossy-surfaced, technically perfect print, and to exalt the class of photograph which he appears to admire, we find him persistingly claiming that the technical details of photography should be entirely ignored and left out of consideration altogether. Over and over again, with every conceivable method of expression, the pages of the photographic press have given publicity to the demand of Mr. Maskell, and of those who for one reason or another act with him, that a photograph should be regarded simply as a work of art. That the ability to produce a photograph pleasing to some extent as a work of art may exist side by side with a complete incapacity to master the comparatively easy technical details, we have annual opportunities of seeing in more places than one, and this fact may be taken as supporting their contention. But it is amusing, to say the least, to find that, when it becomes advisable to denounce the employment of painters as Judges, the same writers labour to show the extreme importance of a knowledge of technical photography in a Judge, and that Mr. Maskell has occupied a column and a half of the Journal in advocating the importance of technique. If a knowledge of photographic manipulation is so important in a Judge, how much more so must it be to those who produce the works judged; and, on the strength of his complete conversion to the views held by ninety-nine hundredths of the better class of photographers, I cannot refrain from offering him my heartiest congratulations.

The difficulty under which photographers who are anxious to have their pictures judged as works of art have always laboured has been caused by the absence from their ranks of men who have undergone anything which may be compared with the training of the painter. With exceptions which can be counted on the fingers of one's hand, the photographer's training in this respect has been confined within limits which the man whose life work is painting passed while in the teens. Judged even by the South Kensington standard, I have great doubt whether the ranks of those who use photography as a graphic art could produce a couple of dozen men whose training would admit of the authorities granting an elementary art teacher's certificate. The reason for this is not very far to seek, and does not lie in the absence of artistic ability in those who take up photography, but is rather to be found in the limitations of photography itself. These limitations soon drive the artist to the pencil and the brush, leaving to photography those to whom the lack of time, opportunity, or ability, compel to be satisfied with the camera and printing frame.

It is with no desire to depreciate photography and photographers that I write as I do, and I should be the first to acknowledge Mr. Maskell's boldness in claiming the high ground he does for photography as an art; but the very extravagance of the claim can only damage the cause by exciting the feeling that, where the main claim is disallowed, the minor claims must go also, and no good can come from articles in which the "pictorial photographer" is encouraged to think still more lightly of himself than he does already. Photography may be regarded by some as a short cut to the studio, doing away with the necessity for anything more than the possession of a certain amount of uncultivated taste; but painters, the general public, and nearly all photographers (including "Cosmos"), give an unmistakable verdict by using the word "artist" without qualification as implying painter.

One of the most remarkable features in connexion with photography is the extreme rapidity with which the necessary ability can be picked up; and by turning over the pictorial supplements to the *Amateur Photographer*, which used to appear some years ago, it can be seen that the art training of some of those who pose as authorities is of the most recent and sudden nature. It is to the fact that, with two or three exceptions, the loudest "professors of the system," to use Mr. Maskell's phrase, are the production of the last five or six years, that the poor opinion of the work of ten and twenty years is due. Thus, I notice a writer in a contemporary states that till three or four years ago all exhibitions were little else than exhibitions of technical skill, ignorant apparently that before this time there had been exhibitors named Robinson, Blanchard, Rejlander, Salomon, and many others whose work displayed at the very least as much artistic ability as any now shown in this country. Of course, the prints of ten and twenty years ago look crude and "technical" now, the fashion has changed. But to suggest that these workers and many others exhibited their work simply as technical or topographical photographs, and that their aims were not as high as those of the best present-day workers, is to indicate blindness of a very aggravated type. Photography as an art dates back, as Mr. Maskell has pointed out, to 1845 at the least; and to conclude that because *Bringing Home the May*, for example, is not in keeping with modern ideas, its producer aimed simply at a good technical result, is as erroneous as to imagine that our grandmothers did not dress for effect because they wore crinolines and coalscuttle bonnets. Photographers have always been divided in interest, some inclining towards the manipulatory details, others towards the artistic side. Just as we see now, on one hand, Mr. Robinson complaining that the Photographic Society is too exclusively technical, while Mr. Horsley Hinton, on the other, denounces it for paying too much attention to artistic work, we find in the past similar workers endeavouring to monopolise the attention of the Society to one or other side of photography. The times change, but human nature is human nature still, and a photographic exhibition in 1886 was not so unlike a photographic exhibition in 1896 as many people seem to imagine.

R. Child Bayley.

JUDGING PHOTOGRAPHS.

The very interesting and opportune communication by Mr. Maskell on the subject of *Painters as Judges at Photographic Exhibitions* (see The British Journal of Photography, September 18, 1896, p. 597) is worthy of careful consideration. The subject in question is one of far-reaching importance to all photographers who aim at producing pictorial work, be they disciples of the sharp-all-over, the fuzzy, or any other method of expression. As Mr. Maskell very properly points out, photography "has had time to acquire a status of its own," and he also instances the unfitness of seeking an engineer's opinion in electric matters. But something further may be said upon this topic. The same conclusion may be reached by a somewhat different though partly parallel course.

In the first place, it may be taken for granted as admitted generally, almost universally, among present-day artists, be they architects, sculptors, engravers, etchers, &c., that no thinker or writer has so accurately formulated the great *art principles* as Mr. Ruskin. Not only is his *teaching* very generally accepted—with perhaps here and there allowance made for strong personal predilection—but its effect is being constantly seen in the best *work* of our foremost workers, and in no department more than in that of modern painting.

Now, Mr. Ruskin has laid it down again and again that, while there are certain underlying principles common to all forms of art, yet each has its own special excellences and limitations; that, when work by one art method resembles work by another method, it is a symptom of weakness, showing that the virtues of the material are not known or appreciated, or properly used. The rule of art is "I can, therefore I ought." Furthermore, he says that an art is bare if it does not properly employ the special and distinctive qualities of its materials and methods. For example, methods and results which in drawing are good and highly commendable may be bad and to be condemned in painting. In the same way the water-colour drawing which aims to imitate oil-colour painting is based on wrong principles. In a work the best art is that which has the greatest knowledge of and command over its own peculiar excellences, possibilities, and limitations.

If, now, photographers seek the opinion and decision of any other art workers, *e.g.* architects, sculptors, painters, etchers, &c., who have not practical knowledge of photographic possibilities, methods, and limitation, it would seem *primâ facie* probable, to a degree practically amounting to certainty, that such opinion would be quite unreliable. The opinion would not necessarily be wrong, but it would only be right by chance, and not by knowledge. For how can a man judge of things concerning which he is ignorant?

Practical knowledge is of the essence of adjudication. The real critic is he who makes a *κρίσις*, *i.e.*, a separation or discrimination, and not, as is too commonly supposed, one whose business it is to pronounce *κατάκρισις*, a condemnation. Without knowledge, it is not judgment, but opinion, which very probably springs from guesswork and prejudice. In this connexion it may be well to recall the well-known words of Quilter: "I have given some years of my life to the study of pictures and to the technical processes of art, for experience has convinced me that without practical power of drawing and painting no real knowledge of pictures is possible."

Again, if a man who is a painter only (*i.e.*, without practical knowledge of photographic methods) is duly qualified to judge photographs, it should follow that a photographer who knows nothing of the practical painter should be a competent judge of painting. It would be interesting to know the painter's views upon this aspect of the question.

To return, however, to our starting point, viz., that every method has certain properties, virtues, and limitations, which are essential parts of its existence. For example, the sculptor deals with things on the round, in relief and form is of the essence of his method. Colour would degrade, confuse, and detract from this. Hence attempts at coloured sculpture have always been shunned as base and false methods. Painting, on the other hand, deals with things in the flat by an admittedly obvious optical illusion, but here colour is of its essence, and all else must contribute and not rival the nobility of colour. Similarly the etcher, working with a point giving a line, sacrifices everything to grace and expression in his lines. He stands or falls, as the vitality of his line is or is not.

Coming now to photography, it is not easy to find any *one* word which compresses its unique and unrivalled power of recording the existent, but every practical photographer feels he has a power of presenting what is before him much or little, sharp or soft, which no other at present known method possesses.

As Mr. Maskell says, "It has had time to acquire a status of its own." But we may go farther, and say that the best work of the more advanced pictorial photographers has already shown—examples may now be seen on our Exhibition walls—that not only has it acquired a status of its own, but, further, these results show that modern triumphs have placed in the photographer's hands possibilities which are quite out of the reach of any form of draughtsmanship. Thus photography has its own canons of art, range, and practice.

Photographers generally have in the past made a very serious mistake in endeavouring to make their work always accord with the painter's and etcher's dicta. To a considerable extent this has delayed the exploitation of photography in the pictorial direction. Not only is there no inherent necessity why photographers should, as heretofore, limit themselves to feeble imitations of engravings or drawings, but such a self-imposed limitation is contrary to any logical sequence.

We English folk are essentially, and as a majority, characteristically conservative. What hitherto has been the standard or limit is not easy to displace. This attitude may be safe, and often is commendable, but, when carried to excess, is very apt to strangle originality, and discourage the growth of that most desirable quality, viz., expression of personal feeling. Not that any oddity or extravagance should be admitted as original merely because it is something different from previous practice or results, but what seems especially called for at this present juncture is a more liberal attitude of mind, such as leaves one absolutely free to accept or reject a result entirely on its own merits, without staying to inquire how it was or was not produced, or how it agrees with previous standards of photography. In a word, what we need is that photographs should be examined as photography, and not as the best imitation we can make of something else.

Etchers, sketchers in black and white, and others, have scoffingly pointed to certain examples as palpable imitations of methods other than photographic. But, in reply, two things may be said: Firstly, if the photographic worker *only* aimed at producing an imitation, he is debasing his art method; but, secondly, that a platinotype worker should produce something very like an engraving, or a pigment gelatine print should resemble a wash drawing, does not *primâ facie* prove that the photographic workers were aiming at imitation, and nothing more. The fact that any worker was the first to produce a certain result does not debar every one else from producing a similar result in that or in any other way, provided the result be satisfactory when done.

The early Assyrian who scraped grooves on wet clay, or the prehistoric gentleman who scratched on a bit of horn an Impressionistic sketch of the mammoth, do not debar the wood or metal engraver from cutting their lines. The silversmith, using a brush to polish his goods, does not proclaim against the bootblack producing a polish in a similar way, nor is there any reason in the painter objecting to others using a brush, or producing results similar, and not always pictorially inferior, to his own. Any stick will serve with which to beat a dog, and this dog-in-the-manger cry of "You are trying to imitate us!" is unhappily one which does not leave the photographer entirely free from blame. He has unfortunately thought that the painter's opinions, subjects, and methods were final, and that the nearer he could approach them the better were his chances of securing a comfortable corner in the artistic Walhalla. But the numerous recent successful examples of our foremost workers—English and foreign—have abundantly shown that we need no condescending patronage at the hands of painters, etchers, or others. We have a position and an art of our own, and it is giving ourselves away when we call in others, who know nothing of our practices and possibilities, to tell us what is good or bad.

We are, of course, always glad to know what others think of our results, of the impressions our work gives them; but their opinion, as non-photographers, is only an opinion, and not a judgment. It is exactly of the same intrinsic value to us that our opinion, as photographers only, of their painting is to them.

Every true artist works, first, for himself, as an expression of his own likes and dislikes, feelings, fancies, and ideals; secondly, for those who follow methods the same or very closely allied to his own; thirdly, to all who have artistic knowledge and culture apart from their method of expression; and, consciously or unconsciously, he feels within himself the sentiment which in Yorkshire we express aptly, if not elegantly, in the phrase, "Let every tub stand on its own bottom." F. C. Lambert.

ENAMELLING GELATINO-CHLORIDE PRINTS.

In the general practice of photography the best average of good results in the different processes is obtained by adhering as faithfully as possible to the instructions supplied by the manufacturers. After conscientiously practising these, then individual departures can be indulged in, perhaps more suitable to the worker's special requirements.

It often happens, however, that the maker's directions are of a meagre description, too much being taken for granted. This is apparent in most of the detailed hints issued by manufacturers in reference to the enamelling of gelatine prints. The subject is variously summed up to the effect that a highly glazed surface can be obtained in the usual way by squeegeeing the print on glass, &c. The many little points necessary to success are not entered into, and, as a rule, an amount of unnecessary waste is encountered before the worker settles down into a regular groove. There are many modes, but one will be sufficient for the present.

The absolute certainty of prints, in large quantities, being made to strip from off their polished surfaces, free from specks or blemishes, is required before orders to any extent can be undertaken. A glance at numerous photographers' show-cases and windows reveals at times the erratic nature of some of the modes adopted. Enamelling has everywhere to some extent been attempted, but not always with regularly brilliant results. A tell-tale large print here and there left displayed on the glass support betrays the nervous reluctance to strip it off, lest it should stick like its unfortunate predecessors. This unreliability has in a measure compelled many to abandon enamelling altogether. The whole process has become so distasteful that they completely discard, and then abuse it roundly, as not artistic. The easily worked matt surface is glorified and pushed upon the customer. Personally I infinitely prefer matt surface to enamelled, but a section of the public demand the latter and should be more liberally catered for. The following hints will be found in practice to work well: Attend to the manufacturer's formulæ in washing, toning, and fixing. After the preliminary washings it is advisable to use a stronger alum solution than usually recommended, and also to leave the prints in it a longer time—say double. This will better ensure the hardening of the gelatine, which simplifies matters afterwards. After a thorough washing, make up the toning bath fairly strong, bearing in mind that, should the toning drag, the evil of softening the gelatine commences by a prolonged action of the sulphocyanide of ammonium.

When toning and fixing are finished, the prints should be washed as well and as quickly as possible, certainly not longer than two hours. A prolonged washing softens the gelatine and completely ruins it for enamelling. After washing, drain and spread the prints face outwards to dry on sheets of paper or linen in a room free from dust. A good plan is to leave them all night, and by the morning they ought to be ready. The prints can, of course, be squeegeed straight from the washing water with excellent results; but, if there be any tendency to over-softening of the gelatine, with subsequent sticking to the glass, the plan recommended of drying hard will be beneficial. Various substances have been suggested and manufactured for squeegeeing upon, but the best, undoubtedly, is glass. It must be absolutely free from scratches or blemishes, have a highly polished surface, and be scrupulously clean.

The glass used by makers of dry plates is now of a more superior kind than formerly, consequently waste negatives may be utilised for this purpose.

A most effective mode of removing the film and cleaning is as follows:—

Put into a dish a pound of ordinary washing soda, and dissolve it in two or three pints of boiling water. Place the glasses in one by one, the films all one way, say downwards. If the films are face to face, they will stick and become troublesome. Leave in the warm solution for an hour or so; the films will then be found quite soft and readily removed. Wash well and then place the glasses into a fresh dish of water, say a quart or two, with the addition of an ounce of strong ammonia. Leave steeping a while, and finally rinse well under the tap. After they are thoroughly dried make a soft flannel pad, dab it into powdered French chalk, and well rub both sides of the glasses. At this stage carefully reject any blemished glasses. After a sufficient quantity is piled, get an old silk handkerchief, or other soft material, and carefully clean off all the chalk. It is imperative that every particle be removed, for, if any is allowed to remain, an ugly smear will appear in the finished print. It is advisable to chalk and clean both sides; there is then no fear of an assistant using the wrong side.

A good plan is to have a distinctive mark, say with black varnish, which would save the double labour.

Carefully select the best polished surface, and stack ready for squeegeeing. For this, place the prints, one by one, into a dish of clean water; in two or three minutes they will be sufficiently moist to proceed. Rinse the glass under the tap, or in the dish; take the wet print and place it on, face downwards; slightly drain, and gently use a piece of soft thin indiarubber cloth or flannel to the back of print, rubbing out the excess of water, and dispersing air bells. Then spread out to dry. This should proceed evenly, and not too quickly. Bear in mind the moistened gelatine will run and adhere to the glass if at this stage it is placed too near a fire.

Use the same judgment in drying as with a gelatine negative, and all will go right. When dry, pile them up ready for mounting the backing papers.

It is important to procure a good sample of backing, for with the right kind the prints will strip off regularly and with certainty. It should be stronger than ordinary note paper. Several dealers make a speciality of it in cut sizes under the name of ivory backing. This will be found convenient to use.

For mounting, use freshly made starch. Pile up the backing papers, and, with a broad brush, paste them well, being as careful to avoid lumps as in ordinary mounting. Place the papers on backs of prints on glasses, and rub well down.

Spread out to dry, and, if in a moderately warm room or in the outside air, they will soon be ready for stripping. They dry very well in the open when a good current of air is about. A little experience will enable you to judge with certainty when they are safely ready, and, with the aid of a knife at edge of prints to start the stripping, the whole batch can be rapidly and successfully taken off. As a matter of every-day work, there should be less waste with enamelling than with burnishing. When a print is spoiled by the burnisher it is irretrievably ruined at the final stage, which means the loss of mount as well; whereas, with enamelling, a spoilt print can be, as a rule, restored by reimmersing in water, removing the blemish, and re-squeegeeing.

The trimming is easily effected, but the mounting has proved a pitfall to many. Unless a proper mode is adopted, the superior enamelled surface is dulled, and the result rendered most objectionable.

The backing is used to prevent the mountant from permeating the print and dulling its surface, and the mountant itself is prepared with the same purpose in view.

Melt some ordinary glue with as little water as possible, the less the better. When fully melted, and while hot, add methylated spirit until the mixture is of the right consistency for use, which will be found about as thin as golden syrup. The addition of glycerine is an improvement—about half an ounce to a quarter of a pound of glue. Do not use the mountant too hot, and there will be no fear of its penetrating the backing.

In mounting take the backed print in left hand, and with a thin hog's-hair brush glue round the edges to the extent of a quarter of an inch. Brush it on lightly and in such a manner that none will be squeezed out when the picture is under pressure. Place the glued print on mount, cover with piece of tissue paper, and pile face downwards one on the other, using a flat iron or other convenient weight.

THOMAS M. LAWS.

OBTAINING PHOTOGRAPHS IN RELIEF IN GOLD, SILVER, AND OTHER MATERIALS.

MESSRS. HILL & BARRATT are the patentees of this invention which relates to the making of photographs in true relief, either in plaster or other plastic material, or in metal by electro-depositing.

The process in the first stage depends on the well-known action of light on bichromated gelatine, in rendering it insoluble and incapable of absorbing water, and is to obtain a simple method of obtaining higher relief, and also, in the case of portraiture, to correct the false modelling which in most cases is present.

In the case of side-lit portraits with black backgrounds no preparation of the negative is necessary, nor from copies of wash drawings where the backgrounnd is the darkest part.

In the case of an ordinary portrait false modelling may occur, as light in this process takes more note of colour than form, for instance, a portrait in which the hair is dark; the modelling of the face would be rendered correctly, but the hair would appear in the relief to sink into the head, and the background, if light in colour, would not recede sufficiently to throw the head into high relief.

To overcome this difficulty the background is painted on a print from the negative, with black pigment, and the lights on the hair accentuated with a white pigment. An alternative is to make a thin negative, intensify with uranium, and reduce where necessary with strong ammonia.

The method we prefer to work is to coat a piece of plate glass (which has been well rubbed with talc,) with gelatine, to which may be added proportions of sugar and citric acid to render the gelatine flexible; this is dried gradually to prevent reticulation. The mixture when dry is stripped from the glass, and is then sensitised in a solution of bichromate of potash (preferably two per cent.).

It is then exposed to the action of light under the negative, the gelatine being flexible can be readily examined to watch the progress of printing.

When sufficiently printed it is firmly cemented to glass, with an adhesive which swells in the same proportion as the gelatine. We prefer the use of isinglass dissolved in weak acetic acid, to which is added a small proportion of celluloid dissolved in amyl-acetate.

The plate thus formed is soaked in water, and the gelatine will swell where not acted on by light, and a photograph in very low relief in gelatine is obtained.

When all the bichromate is soaked out, the gelatine relief is plunged into weak acid, preferably citric acid, in the proportion of one part of citric acid to six of water by weight, or citric acid may be well rubbed into the surface, and is then transferred to cold water.

The gelatine not being able to swell laterally, owing to its being cemented to glass, expands vertically, but only when still absorbent to water; when the gelatine has been acted on by the light, the acid will

not penetrate. The increase by this treatment is from two to four times the relief originally gained.

From the swollen gelatine thus obtained, plaster casts may be taken, or copper may be deposited direct if the surface is rendered conductive by the use of any of the well-known agents, such as bisulphide of carbon and phosphorus followed by nitrate of silver solution.

The patentees claim:—

I. The correction of the print or negative as hereinbefore described, or by retouching on the negative.

II. The vertical expansion of a gelatine relief, by means of an acid, preferably citric.

III. Photographs in metal, or plastic material from gelatine reliefs.

THE SOLARISATION PROBLEM.

[Translated from the *Photographisches Archiv.*]

Mr. F. Krohn* doubts if a membrane of metallic silver prevents, in a measure, the penetration of the developer to the back of the film, as I have supposed. Further, he does not believe that the whiteness visible between the silver and the glass is bromide of silver. The first of these phenomena, unfortunately, cannot be so easily proved by drip experiments (see *Photographisches Archiv*, 1896, page 228; *Naturw. Wochenschr.*, 1896, page 353), like the properties of other membranous deposits. For, in the first place, we are not dealing with a jelly, but with a dry gelatine film, when the plate is immersed in the developer. The diffusion processes in such are quite different from those when the film is saturated. Consequently, I am unable at present to do more than draw conclusions from what happens in developing a dry plate as to the truth or untruth of my hypothesis.

In the following I will describe a further observation concerning the appearance of the back of a negative.

A bromide dry plate, prepared for photo-mechanical purposes, with a somewhat thick coating of a slightly ripened emulsion, was exposed in the camera through the glass. Upon development with a normal hydroquinone developer, the picture appeared quickly in full strength on the glass side. The front of the film, on the contrary, did not blacken, even with more prolonged development. In this case the image was of no great depth, because the bromide of silver was reduced only on the surface next the glass. The light had not sufficiently penetrated the film.

A second plate was given a rather longer, and therefore normal, exposure, and then treated with the same developer. The light having penetrated sufficiently, the image appeared on the front as well as on the back. By transmitted light the image was exceptionally vigorous.

In over-exposure an image appears first on the surface. It is comparatively hard. After further development it passes through the film. From the glass side it has a flat to veiled appearance.

With still more exposure, and especially if treated with a strong developer, the negative does not penetrate the film to the back. It may appear there in the nature of a positive.

Further, *the penetration of light* through a coating of emulsion also plays an important part. Transparent chloride plates are traversed by it more quickly than well-ripened gelatino-bromide plates. The opacity has already been used to avoid reflection from the glass (halation). An addition of iodide of silver, for instance, has been utilised. Eder arrived at the conclusion "that the thinner image due to iodide of silver on a gelatino-bromide plate is partly ascribable to the non-actinic colour of the former, which hinders the penetration of light." Or the penetration of light may be counteracted, for the above purpose, by the addition of dyes to the emulsion, as recommended by Eder and Vidal. The former preferred chinoline yellow, the latter picric acid and the picric salts. But it would be going too far to ascribe to this circumstance alone the greater density given by gelatino-chloride and unripe gelatino-bromide, as compared with ripened gelatino-bromide equally rich in silver. The depth to which light can penetrate is to be considered in explaining the effect of Sandell plates. Moreover, as I have shown above, all thickly coated emulsions are capable of yielding, on the one hand, flat, and on the other hand vigorous, images.

But all the phenomena cannot be attributed to the penetration of rays of light. *For the present I have no other explanation to offer for them than the protection of the deeper layers from the developer by a membrane of metallic silver.*

Whether this silver membrane also hinders fixation, or, in other words, whether the whiteness lying between the metallic silver and the glass is unreduced bromide of silver, is another question. The second objection made by Krohn is opposed to this, and I must admit that I was unable to remove the whiteness when *subsequently* stripping the film from its support. I will, however, investigate this matter further.

What can this whiteness be? Gaedicke wrote to me recently, that he had often examined this whiteness and formerly had attributed it to a modification of the metallic silver. Krohn appears to be of the same opinion. This theory would consequently read as follows, that after too much exposure another form of metallic silver is produced in development.

But why is this always formed only between the black, ordinary silver and the glass? Why not, for example, on the surface of the film if the plate is exposed through the back?

Perhaps future investigation may lead to a totally different explanation. But for the present I do not know of any other, although different facts cannot be brought into harmony with it.

That, besides these diffusion processes, purely chemical may also cause the veiling and ultimately solarisation, I will not dispute. Solarisation of printing-out chloride papers can, probably, be caused by the latter only. I only wished to draw attention to the fact, that the phenomena of diffusion should be borne in mind in photographic processes, more than has hitherto been the case.

Physics, in the apparently pure chemical processes of photography, must receive as much attention as in the processes going forward in living beings. Only because the problems were considered too exclusively from the chemical standpoint was it impossible to arrive at a solution sooner.

If my physical theory of solarisation was rather too one-sided in the opposite direction, this was principally to show, for once, how great a part may be ascribed to purely physical processes. R. Ed. Liesegang.

* See The British Journal of Photography, August 28, 1896, page 554.

BYROM'S IMPROVEMENTS IN GRAINED SCREEN PLATES FOR PHOTO-MECHANICAL PROCESS WORK.

Mr. John Byrom states that his improvements consist in making a screen or grating which shall be indestructible, and, at the same time, have a clear plane glass surface at a lower level than the opaque lines or dots.

In making a screen under one modification, a glass plate is first coated with varnish or with printers' ink, or other suitable substance, and afterwards dusted with enamel colour, or such colour may be mixed with the varnish or ink, or other suitable substance when applied.

The plate is then ruled, and afterwards fired in a kiln to fix the colour in the lines or dots.

"If desired, the plate, after being coated with enamel colour, may be fired before being ruled, and in this case, in order to form the lines or dots, I coat the fired plate with a suitable resist, then rule through the said resist to the enamel colour, and afterwards etch through the enamel colour to the plane glass. By this means a plate is produced of which the grained surface is not liable to be damaged by rough or careless usage.

"I do not confine myself to ruling the plate as above described, as various methods of producing the screening or graining may be employed as found convenient, as, for instance, an impression may be taken from a ruled or etched metal plate, or from a reticulated gelatine film or collotype tissue, and such impression applied to the plate, which is then dusted with enamel colour and fired as above described; or I may transfer direct from the gelatine film or collotype tissue, or I may apply the resist above the fired enamel colour in the form of a powder, and preferably in a resin dusting box, so as to obtain a grain, afterwards heating the plate to melt the dust, and fix it, and then etch through to the clear glass.

"Or the enamel colour may be dusted on to the varnished plate so lightly as to form a grain, and thus dispense with ruling or transferring."

Mr. Byrom claims: A screen plate or grating, the screening or graining of which is formed of enamel colour fixed and burned into the glass by firing in a kiln.

RETOUCHING MEDIA.

To the portrait photographer the question of a reliable retouching medium is an important one. For, in spite of all the denunciations of artists and scientific photographers, retouching is more necessary than ever, and as long as human nature is human nature retouching will remain an essential part of every portrait photographer's daily work. Therefore, it is desirable that each should find for himself a medium upon which he can depend. As I make a medium which is put upon the market by a London dealer, I cannot give a formula as desired by your correspondent, but I can point out some differences in various kinds offered for sale. One make which I used for several years, and which appears typical of many, consists apparently of a hard gum dissolved in oil of lavender and turpentine, with the addition of some slow drying substance, which keeps the surface of the negative in a sticky condition for a day or two. My experience of such a medium was, that when the bottle was first opened the medium was too thin, and it was difficult to get sufficient work upon the negative. When about a week old the medium seemed at its best and then soon deteriorated, becoming what painters call "fat," giving a greasy film difficult to work upon, and in a week or two the remainder of the medium was useless. Another disadvantage it possessed was that the negative had to stand at least an hour after the application of the medium before work could be commenced, and it seemed to be in its best condition if applied to the negative overnight.

Still another disadvantage was that it dried so hard that no more work could be put upon it, if left for a day or two. This was very inconvenient if very large heads were being retouched, as the condition of the medium changed entirely before the negative was finished, and, if from any

cause the work had to be put aside for a day, it was necessary to begin again.

My retouchers complained so much, and so much medium seemed wasted, that I made several attempts to concoct some of my own. At first I succeeded in making a small quantity, but when I attempted to make more I failed. At last I started on a new plan, and, instead of using a hard resin and a slow or non-drying substance to make such a combination of hard and soft resins as would give a film capable of taking the lead. After several experiments, I succeeded in finding the proper proportions of various gums dissolved in a simple solvent, with no addition of slow-drying substance, and which gave a film capable of receiving the lead in a similar manner to working upon paper. Instead of working the lead *into* a more or less sticky film, I now had a film I could work *upon*, for which I claim several advantages. It is ready to work upon as soon as the solvent has evaporated; the film, when once spread, does not alter, as it is quite dry before work is commenced, and at the end of a week will take the pencil as well as at first; and, lastly, the medium will keep in good condition to the last drop in the bottle. This, I admit, is a distinct disadvantage from the maker's and dealer's point of view.

With regard to spreading, I prefer the finger. I cannot get the film even or thin enough if I use rag.

A favourite medium with some workers is the fat oil which is a residuum of turpentine. I tried it once, but only once. It was to me a filthy mess. Others recommended castor oil thinned with turpentine, but I could never do anything with it. I have also tried roughening the film with cuttlefish and resin, and resin alone, but I am like Mr. W. S. Gilbert, who, when an actor introduced some "gag," told him it was very funny, but he added, "I like my own best." HAROLD BAKER.

THE LATE MR. WILLIAM ENGLAND.

THE gentleman whose name is at the head of this notice, and whose loss old photographers must deplore, was one of its earliest workers, having been a most successful Daguerreotypist. Some of his instantaneous examples in that branch would surprise many in the present day. He was the first to take photographic views in America and Ireland. Those of the Exhibition of 1862 were taken solely by himself.

His reputation was not confined to this country, he having been nominated as Juror at the Paris International Exhibitions of 1878 and 1889. In the latter he was chosen foreman of the British Photographic Section, on which occasion he received the thanks of H.R.H. the Prince of Wales, and, although the recipient of many medals, this was his most prized recognition. At the same time he received the French decoration of Officier de l'Académie. He was connected with the Royal Photographic Society for over thirty years, more than half of which he sat at the Council board. Although a man of very retired manners, his vast knowledge of the art he loved was always at the disposal of any one seeking it.—*Communicated.*

THE LATE DR. JOHANN PAUL EDWARD LIESEGANG.

THE following particulars of the life of Dr. Liesegang are given in the *Photographisches Archiv*.

He was born on June 26, 1838 at Elberfeld, and began his studies at the intermediate school there in the year 1843. After studying natural science, chemistry in particular, at the universities of Berlin, Giessen, and Jena, he received the degree of doctor in 1859.

His first impulse to photography came in his fourteenth year, when the photographer, Emden, whom he helped for amusement, erected a studio in the large garden belonging to his father. The outcome of this was, that he published in his sixteenth year a "Guide to Photography," which afterwards by degrees grew into his large "Handbook."

After leaving the university, he founded in Elberfeld a manufactory for albumenised paper and a photographic apparatus factory. These were transferred to Düsseldorf in 1873.

The manufacture of albumenised paper was subsequently superseded by gelatino-chloride paper (aristo paper) which he was the first to place upon the market.

He was the first to introduce into Germany the collodio-chloride process invented by Simpson. From his mechanical workshops the most divers apparatus were sent out, amongst which may be mentioned his own special panoramic camera, and his apparatus for enlarging and optical projection.

At the same time his activity as a journalist and publisher became more extended. In 1860, he founded at Elberfeld the *Photographisches Archiv*. Shortly after followed the *Moniteur de la Photographie*, the editing of which he shared with Ernest Lacan. His *Amateur Photograph* was started in 1887. The quarterly publication, *Lanterna Magica*, was devoted especially to optical projection. The Italian paper, *L'Archivio Fotografico*, was also produced for some years under his direction.

The Inquirer.

*** *In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

CHROMATE OF POTASH.—J. H. F. asks: "How can I make neutral chromate of potash from the bichromate? I have plenty of the latter, but cannot get the former here. I have tried adding caustic potash, but the result, so far, has not been much to speak of, certainly not to boast about. I shall be thankful for any help."

"PERISHED" INDIARUBBER.—COLLODION says: "I have a pneumatic holder that is some years old, and the ball as well as the disc have both gone wrong. The disc is all cracked and hard, and the ball stiff and inflexible, although it does not show any cracks. Can I do anything to soften them? I am told I can get a new disc, but I suppose the ball will prove a different matter.

DEVELOPING KINEMATOGRAPH FILMS.—CINEMATO says: "I would be glad if you can inform me, through THE BRITISH JOURNAL OF PHOTOGRAPHY, as to the best way of developing the long kinematograph films. I have two or three ways of my own, but, as it requires the assistance of two more besides myself, it is not so satisfactory as I could wish. By starting a discussion in THE BRITISH JOURNAL OF PHOTOGRAPHY on this matter, I feel sure many others besides myself would be interested."

INVERTED ALBUMEN.—F. HAROLD writes: "I have read the correspondence on this subject, and I think E. Freeman's failure with the formula he mentions arises from the use of diluted albumen and too weak soda solution. The formula I have always used—I think I got it originally from Watts's Dictionary—consists of albumen pure and simple and caustic potash dissolved in as small a quantity of water as convenient. With this I don't think E. Freeman will find any danger of the product *dissolving*, but it may be difficult to wash."

SPOTTING PRINTS AND NEGATIVES.—BEATEN says: "Will any one tell me how negatives and prints are 'spotted'—whether the 'art,' if any, lies in manipulative skill simply, or in the use of some special spotting material? I use the best and finest sable pencils, and water colour mixed with a little gum water. With prints I can get on fairly well, as the extra colour does not show much; but with negatives, when I operate on a pinhole, I get enough stuff on to cover a dozen, and, if it is a bigger hole, the colour will not stick at all. I do not know that my sight is defective, but I find great difficulty in getting out the right spot, especially in negatives. Some of your readers may be able to throw out a hint or two, for which I shall be deeply thankful."

PURE WATER.—W. FINLAY writes: "I am greatly troubled with bad water, which comes from a well which is not itself foul, but which is supplied from surface water, and now and then, after heavy wet, we get the benefit of all the filth in the neighbourhood. Of course, for domestic purposes, we have to boil and filter all we use, but this is beyond my power for washing prints, &c.—at least, up to the present. I write now to ask if any reader can recommend me a *cheap* method of filtering large quantities quickly—in fact, a cheap home-made filter. I do not need for this purpose perfectly pure water, as for drinking, but sufficiently so to stand the silver test, and, above all, free from grit."

SULPHOCYANIDE AND THE DOUBLE FIXING OF PRINTS.—J. H. HEMSLEY writes: "I notice that a week or two two ago a correspondent in this column mentioned the use of sulphocyanide as a second fixing bath for prints. I should say to him, Don't use it. With albumen or collodio-chloride it may be no worse than useless, but with gelatine it would prove utter ruin if sufficiently strong to do any fixing at all. Besides fixing the prints it would make them fix themselves to anything they came in contact with. In fact, to be of any use in fixing, the sulphocyanide must be very strong, and then its softening action on the gelatine makes the prints as adhesive as a 'fly-catcher.' They are bad enough when only fifteen grains to the ounce are used in the toning bath."

A Retouching Surface for Negatives.—A Country Professional says in reply to J. C. in last week's column: "I some time ago made a number of experiments on the lines suggested in an article I saw in your columns, with the result that I succeeded fairly well in getting a matt surface on the gelatine film, though sometimes it is accompanied by a slight grain, not sufficient to interfere with printing, but rather awkward in delicate retouching. I need not recapitulate all my experiments with different substances, for fortunately I succeeded best with materials at hand in every studio or dark room. The following is the plan I adopt: Let the negative dry after fixing and washing, then lay it for five minutes in a rather weak solution of alum. I cannot give a very definite strength, as plates vary so, but I use five grains to the ounce with some, and as much as ten grains with others. Take it out, and, if the solution does not drain evenly away without leaving drops, blot it off with a clean cambric handkerchief, and allow it to stand until the film has become even and glossy. Then dip it into a dish of dilute ammonia 1 : 10, and leave it for a few minutes, then wash well and allow to dry. It will then have a delicate matt surface, perhaps a faint opalescence, like fine ground glass, and a beautiful tooth for the pencil."

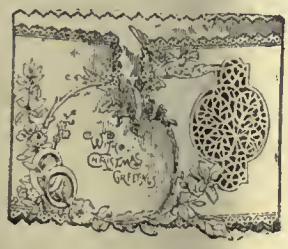
Our Editorial Table.

Houghton's Christmas and New-year's Mounts.

G. Houghton & Son, 89, High Holborn.



Some specimens of mounts suitable for bearing Christmas cards have reached us from Messrs. G. Houghton & Sons. They comprise the folding slip, the plain embossed folding, the plain embossed, plain gold bevelled, fancy gold bevelled, the "frame" slip, and

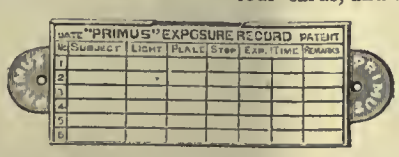


other distinctive varieties. The designs are singularly elegant and refined, and we are sure that photographers and the public will very highly appreciate them. The cuts show three varieties that struck us as being not the least charming of the many submitted to us.

"Primus" Novelties.

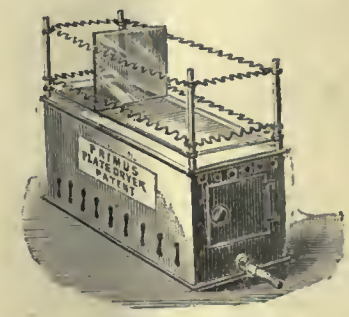
W. Butcher & Son, Blackheath.

"Primus" Exposure Record.—This consists of a neat metal frame provided with screw holes, by which it is attached to the camera. This frame holds three or four cards, and upon these the



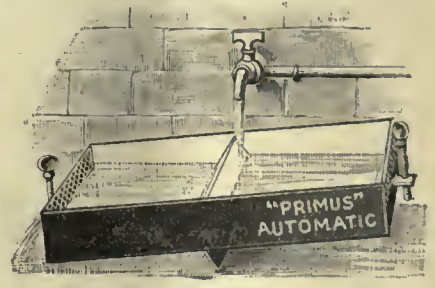
details of the exposures may be recorded. The card is printed front and back, and will accommodate the particulars of one dozen exposures. Fifty cards are supplied with each frame. It is a convenient way of recording exposures.

"Primus" Plate-dryer.—As indicated by the illustration, the plates are supported in wire grooves on the top of the heating plate. Underneath the plate is a box, which forms the heating chamber, through which an atmospheric gas burner runs, and is connected



with the house gas by a piece of indiarubber tubing. It is claimed that plates may be dried by this method in ten minutes, and, intelligently used, it is one that should be found very acceptable when an amateur desires to quickly dry a negative.

"Primus" Washing Tray.—This is automatic in action, and may be used for either negatives or prints. The tray is placed



under a stream of water, so that it falls *on* the pyramidal division, and into the half of the tray which is off the ground. This half, when full, tilts up the other half, and so causes the stream to fall into the other half. The rise and fall—in other words, the rocking—is adjusted by means of the screws at each end. We can speak from practical experience of this tray as a very useful little bit of apparatus.

The "Traveller" Developing Set.

R. & J. Beck, Cornhill, E.C.



This is a handy little set, that packs up into an extremely small compass, which should be found very useful to those who, when travelling, have little space to spare for their photographic impedimenta. It consists of a ruby lantern, the protecting covers of which serve as developing trays. A partitioned case carries a measure, night-light, and granulated hypo. Concentrated developers in dry powder are given. The trays are coated with a tough enamel, which is

proof against acids and alkalies. The measure is of a convenient form for dissolving the developer. The developer is contained in two small bottles with screw caps, which serve as measures when mixing a solution for use, no weighing being required. The hypo-sulphite occupies the minimum of space.

It is a compact little set, and capable of being very useful to the traveller. The size of the closed packet is about 5×4×3 inches.

News and Notes.

MESSRS. ELKINOTON & Co. have removed from Church-street to 115½, Abbey-street, Nuneaton.

MR. ALEXANDER FISHER has had the honour of submitting his enamels for Her Majesty the Queen's inspection, who has been graciously pleased to give him a commission to execute one for her.

As already announced, the Annual Meeting of the National Association of Professional Photographers will be held on Monday next, September 28, at Anderton's Hotel, Fleet-street. The President will take the chair at four o'clock. The dinner will take place at seven o'clock the same day at the same hotel.

THE LANTERN-SLIDE EXCHANGE CLUB (ESTABLISHED 1889).—Mr. A. J. Richardson, of Summerville Dore, near Sheffield, who has, for the last four years, been the Hon. Secretary to the above Club having resigned, the vacancy has been filled by the appointment of Mr. J. S. Hawker, of Mutley House, Plymouth. Mr. Hawker will be glad to hear from any gentleman desirous of joining the Club. The subscription is nominal.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, September 30. First Travellers' Night, and Mr. H. Snowden Ward will deliver a lecture, with lantern illustrations, and entitled *Shakespeare at Home*. Visitors are welcomed upon the personal introduction of a member, or an invitation card can be obtained from the Hon. Secretary, Mr. F. A. Bridge, 55, Dalston-lane, London.

A GIRL who can see the Röntgen rays has been found by Dr. Brandes, of Halle, who discovered her. Starting from the fact that the rays do not penetrate lenses, he hunted for some one the lens of whose eyes had been removed, an operation performed not rarely for extreme short-sightedness or for cataract. The girl, who had had the lens of her left eye removed, was able to see the light with it, though the right eye, which retained its lens, could see nothing. Dr. Brandes asserts that the rays affect the retina of the eye, and, if any one's head is enclosed in an opaque vessel near the source of the rays, the light can be seen even with closed eyes.

KITE PHOTOGRAPHS OF BOSTON.—Mr. William A. Eddy, of Bayonne, N. J., has succeeded in making several distinct photographic views of Boston from a great height by means of a camera supported from kites. The kites were of the tailless type used at the Blue Hill Observatory, where an altitude of 7441 feet was obtained, and were six and seven feet in diameter. Four to eight of these kites were required to support the camera, depending upon the strength of the wind. Distinct views were obtained of the Common, Beacon-street, Commonwealth-avenue, Charles River, and the outlying suburbs, and Mr. Eddy estimates that in one of the views the camera was, at the moment of xposnre, 1500 feet above the pavement.

LEWISHAM CAMERA CLUB.—An Exhibition of Members' Work will be held on Monday and Tuesday, September 28 and 29, 1896, in the Lecture Hall of the Lewisham High-road Congregational Church. Numerous examples of work in the various processes of photography will be shown, including a unique exhibit by Mr. A. L. Henderson of early and present photographic work, including a splendid collection of ceramic enamels. On each evening there will be a demonstration of *Platinotype Printing and Development*, by Professor Carlton J. Lambert, M.A., F.R.A.S.; *Printing and Enlarging on Bromide Paper*, by Mr. H. L. Davis. A choice collection of lantern slides will be shown on the screen. Selections of instrumental music. The Exhibition will be opened on the first day by the President, Mr. B. Davidson; on the second day by Mr. A. Horsley Hinton. Doors open on Monday at seven p.m., and on Tuesday at three p.m. Admission by ticket, price 6*d*. each.

THE PHOTOGRAPH OF TYNAN AND HOW IT LED TO HIS IDENTIFICATION AND ARREST.—Mr. Hemery, of Hanover-street, Peckham writes: "Shortly before the assassination of Lord Frederick Cavendish and Mr. Burke, Tynan was a frequent visitor to my studio, he living only three or four minutes distant, remaining in conversation often for an hour or more to talk about distressed Ireland. Close to him lived another irreconcilable, Frank Byrne, and the police from Scotland Yard, taking advantage one day of his absence from home, made a raid upon the house, and, finding there a photograph of a gentleman in the uniform of the Queen's Westminster Volunteers, brought it to me, asking if I knew who it was. I replied, 'Certainly I do. I hope there is nothing wrong with him.' After some conversation, I began to think—recalling other circumstances, and knowing that Tynan was in Dublin on the fatal 6th of May—that it might, perhaps, be none other than the mysterious 'No. 1,' about whom there was so much mystery. Having hazarded that opinion, I lost no time in seeing Mr. Williamson (Head of the Criminal Investigation Department), and, after a private interview, at which I gave my reasons for the suspicion, the photograph was sent to Dublin Castle, where it was at once identified by Carey and others as the man, 'No 1,' who controlled and directed their movements. 'And a very good portrait too,' said Carey. After that there was no difficulty, as my book supplied the name and address of the unknown, and, the warrant filled up, 250 copies were printed and distributed at every seaport in the Kingdom within twenty-four hours. But the bird had flown. The portraits were taken about ten days previous to the dreadful event in Phœnix Park, and it seems evident that the man desired that his family should possess a memento of him in case he was caught and condemned for the crime so soon to be committed."

Patent News.

THE following applications for Patents were made between September 7 and September 12, 1896:—

SCREEN KINETOSCOPY.—No. 19,716. "Improved Apparatus for Enabling Photographic Images to be Taken, Projected, or Viewed in Rapid Succession." F. W. TAYLOR and A. LOMAX.

DEVELOPING APPARATUS.—No. 19,726. "A New or Improved Apparatus for Developing, Fixing, and Toning Photographs." Complete specification. W. GRUNOW.

CERAMIC PHOTOGRAPHY.—No. 19,917. "Improvements in and connected with Ceramic Photography as applied to Watches and Time-piece Dials having a Ceramic Base for the Figures." H. NICHOLLS and R. CROWE.

FILM-HOLDER.—No. 19,923. "An Improved Mechanical Appliance for easily Attaching and securely Holding Photographic Films Flat to Rigid Supports." W. KIDSTON.

FILMS.—No. 20,080. "Improvements in Means or Apparatus Employed in the Manufacture of Photographic Films." Complete specification. A. C. EDWARDS.

DRAINING RACKS.—No. 20,179. "Improvements in Photographic Washing and Draining Racks." O. F. LEHMANN.

CAMERA STANDS.—No. 20,251. "Improvements in Attachments for connecting Photographic Cameras, Surveying Instruments, and the like to their Stands or Tripods." Complete specification. D. H. T. PEPLOE.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
28	Bradford	Smoking Concert.
28, 29	Lewisham	Exhibition of Members' Work.
28	National Association of Professional Photographers	Annual Meeting at Anderton's Hotel, Fleet-street. 4 p.m. Dinner at 7.
28	North Middlesex	*Lantern Slides and their Production.* E. Dockree.
29	Hackney	*The Half-tone Process.* W. Gamble.
30	Birmingham Photo. Society	Last Day for sending in Competition Pictures, August Excursions, Lill es-hall and Worcester.
30	Borough Polytechnic	Annual General Meeting.
30	Croydon Camera Club	Excursion: Chaldon. Leader, J. Smith.
30	Leeds Camera Club	Beginners' Lecture.—1. *Choice of Apparatus.* C. C Vevers.
30	Photographic Club	*Shakespeare at Hame.* H. Snowden Ward.
October.		
1	Liverpool Amateur	Smoking Concert.
1	Woodford	*Intensification and Reduction of Negatives.* Mr. Malby.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 17,—Mr. A. Haddon in the chair.

Mr. W. F. Slater brought up and subsequently presented to the Association a couple of mechanical prints, and a discussion ensued as to the method of their production. Mr. Slater remarked that they could be printed off as quickly as letterpress, while their cost was very low, and he thought they might be a serious competitor with photogravures, to which process they bore a marked resemblance.

Mr. MACKIE said there was a photogravure process in which there was a grain of a network character in addition to the ordinary powder grain, and he thought the prints shown might be by that process. On examination there was a distinct appearance of cross lines.

MOUNTING P.O.P.

Mr. BAYSTON opened a discussion on the best way to mount gelatine papers. From their first introduction he had found it a very different thing to albumenised paper, but he had adopted the following plan, which, however, he did not assert was necessarily the best, but it was still very good. The prints, after being trimmed, are soaked for a short time in water and drained, and then placed face downwards, one upon another, to any number, upon a piece of glass. The surface moisture is then dabbed off the top one, and starch paste or Higgins mounter, which answered as well, applied with a brush. It is then transferred to the mount, if possible avoiding handling the corners, and is rubbed down with a wet cloth or sponge. He did not use alum with the prints.

Mr. MACKIE said the whole secret of mounting P.O.P. prints consisted in rubbing them well down.

Mr. HENDERSON had saved much trouble by rolling the prints with a rubber roller, with a piece of waxed paper between it and the print. Cloth or paper would stick to the surface.

Mr. MACKIE had mounted a large number with the aid of a cloth and roller, and did not find the cloth stick, and any impression left by it would dry out.

Mr. HENDERSON showed a print toned with the combined lead and gold bath, originally mounted in the year 1859 with starch, and which he had occasion recently to remount. He experienced great difficulty in removing it from the mount, and then only with the aid of such hot water that the whites were yellowed.

PHOTOGRAPHIC CLUB.

SEPTEMBER 16,—Mr. H. P. Smith in the chair.

Various objects of interest were shown. Mr. Charles Wallis showed some of the photographs he had made whilst upon his holiday tour at Fécamp. He promised to give the Club an evening, entitled *My Holiday Trip*, on December 9, illustrated with lantern slides.

The subject of the evening was—

FIXING PRINTS.

A member stated that he had recently experienced a liability with certain samples of hyposulphite to reduction of the image. This was most noticeable with a freshly made fixing bath, and the reducing effect apparently wore off after the bath had been used a little. He had subjected the salt to examination, and found it to be a reasonably pure commercial article, and without trace of free acid. He added that a bromide print placed in the bath made with the hypo to which he referred would turn to a brown colour after about thirty minutes' immersion.

Mr. BRIDGE said he had once left a print for four days and nights in an old hypo bath; it had turned to a beautiful purple, and he thought he had accidentally discovered a new process, but he could not repeat the experiment with success.

Mr. MACKIE said that twelve or thirteen years ago Mr. Garrett had shown some beautiful lantern slides at the Club. He said he (Mr. Garrett) had toned them by leaving them in the hypo all night. This effect was probably due to the silver dissolved in the bath rather than to any direct action of the hypo itself. He added that he (Mr. Mackie) thought it probable that the liability to fade in silver prints may often be attributed in part to this cause.

Mr. BRIDGE raised the question as to whether Professor Haddon's experiments were on all fours with ordinary practice.

Mr. MACKIE thought they were. He believed that Professor Haddon's original experiments had been made with pieces of paper cut from the white skies of landscape prints. Professor Haddon demonstrated that there was always silver left in the whites of a print, and possibly this was due to the cause he (Mr. Mackie) had already referred to, viz., the presence of a salt of silver in the hypo bath.

Mr. WILLIAMS asked if any member could tell him how to prepare a print so that it would certainly fade. Some time since he had been very anxious to produce a print which would not last, and he had purposely left much of the hypo in the print; to his surprise, this picture had not faded twelve months after it was made.

THE ANNUAL OUTING.

Members and friends of the Photographic Club, to the number of thirty persons, proceeded, on Saturday, the 19th, to the Bull and Bush, at Hampstead, to enjoy what has been for some time regarded as an Annual Tea. Some of the members met earlier in the afternoon and rambled over the Heath and surrounding country. At six o'clock Mr. Frank Haes took the presidential chair, supported by Mr. A. Cowan, in the vice-chair, and a substantial tea was done full justice to.

Gospel Oak Photographic Society.—On September 15, Mr. Ramsay gave a demonstration of

SOLIO PAPER.

He commenced by a reference to combined baths, which he condemned, on th ground that the prints toned in this manner were not permanent. The bath he was going to use was in two solutions, one a solution of sulphocyanide, and the other a solution containing acetate of soda and gold chloride. Treating of the defects in prints, he said that a pink or green tinge in the half-tones and high lights was due either to heat or to an excess of sulphocyanide. He then proceeded to tone some prints which he had brought to the meeting, and said that, on putting them into the bath, they became covered with a sort of bloom which appeared on the surface, and which would make them appear, by reflected light, over-toned, before the actual toning had commenced. The proper way to judge the progress of toning was to examine the prints by transmitted light; and, for warm tones, they should be removed from the bath whilst there were still some traces of warmth in the shadows; but for cold tones, inclining to purple, they were not to be removed until all traces of warmth had disappeared. He also said that, the longer a print was to be toned, the further the printing must be carried; and, further, that the temperature of the bath should not exceed 65° to 70° F. The prints should be handled as little as possible, since perspiration produces a red stain, particularly with matt Solio.

Hackney Photographic Society.—September 15, Mr. E. Puttock in the chair.—In reply to a question raised as to the darkening of a solution of potassium chloro-platinite, opinion was expressed as to the effect that such darkening did not practically interfere with the toning power of the solution providing that the metal was not precipitated. Mr. HENSLER advised the addition of a few drops of nitric acid to the solution when first made up; it would then keep clear. Mr. WESTCOTT said that, if precipitation took place, an addition of a little nitric acid would redissolve the precipitate. A question was asked as to the best method of reducing over-printed prints. In reply, it was said that both Farmer's and Belitzki's reducers respectively could be used, but that, unless the original negative were not in existence, it were better to make a fresh print.

North Middlesex Photographic Society.—September 21, Mr. H. Smith in the chair.—Mr. J. W. MARCHANT gave a demonstration on—

THE PLATINOTYPE PROCESS,

especially intended for beginners. He dwelt on the simplicity of the process, and said the main thing to guard against was damp. He developed a number of prints, some from negatives supplied by a few of the younger workers, and they included a few very fine prints, supplied by Mr. Humphries, of the Platinotype Company. He showed what could be done in the way of getting out detail and keeping back too dark shadows by means of glycerine and local development with different strengths of developer. A very able demonstration was brought to a close by a few words from the PRESIDENT (Mr. Mummery), in which he said he hoped to see some result from this on the walls of the annual Exhibition, by members who have not used this process taking to it in place of silver printing.

Ashton-under-Lyne Photographic Society.—Aquarius emptied all his watering pots upon the unfortunate photographers who went to Bolton Wood on Saturday, September 12, under the leadership of Dr. Hamilton. Other excursionists can make a tolerable shift whatever the weather may be. They can take their ease at an inn, and, if mere sightseers, they can even plod along in spite of the pelting of the rain, and enjoy themselves to a moderate extent. But photography is always associated with a fair amount of daylight and not a small allowance even of sunshine. The annual trip of the Ashton Photographic Society, under the guidance of the President, is looked upon as an occasion for establishing a new record in the number of plates usually exposed. On such a day as Saturday was, with all the usual essentials at a minimum, there was little to be gained by attempting to get pictures,—

> "From mid noon the rain
> Had fallen in torrents, all the mountain tops
> Were hidden, and black vapours coursed their sides."

Everything wore a dismal and bedraggled look. Mist and darkness accompanied the heaviest downpours. If the day had been alike all through, it would have been about as bad as it possibly could be; but then there were intervals of comparative illumination, which rendered photographic work not altogether impossible. The noble old Abbey looked almost dark and frowning, if such lovely places ever can wear a forbidding aspect. One cannot help deploring that the Reformation should have been accompanied by the dismantling of so many of these ancient structures, necessitating the erection of a great many inferior religious houses. It was thought the rookeries must come down to disperse the crows, but one now sees that no such necessity really existed. We see at Bolton Abbey, side by side, the preservation of one part as all might have been preserved, and the ruin of the rest, which, at no great expense, might also have been preserved for religious or scholastic uses. Some of the men of that old destructive time have left on record similar sentiments; but, in great national movements, the most violent course is commonly adopted and afterwards repented. However, the very hand of the destroyer has only made these old places more revered and admired than they would have been had they come down to us intact. A stately ruin comes almost to be worshipped by the poet and the painter, who would have seen nothing in the original building to inspire raptures such as Sir Walter Scott's over Melrose seen by moonlight. A ruin, in like manner, attracts the photographers with a subtle magnetism. Why should it be so? Various people have their interpretations. "Age, like distance, lends a double charm," says one; but a building quite as old that is entire excites no such feeling. Some absurd conclusions, we think, have been drawn, such as this:—

> "Thinkest thou the thousand eyes that shine with rapture on a ruin
> Would have looked with half their wonder on the perfect pile?
> And wherefore not—but that light hints, suggesting unseen beauties,
> Fill the complacent gazer with self-grown conceits?"

This is a very imperfect analysis of one's feelings. The sentiment of pity is stirred in the breast, as it would be by the spectacle of an "archangel ruined," or, for the matter of that, by some poor man who has ruined himself and become a miserable wreck. The mind is carried back direct by the ruin of to-day to the far-off time when the building was in use. It is not now associated with any modern purpose, and is looked upon as a sort of miraculous survival, wonderfully preserved from a lost antiquity. It looks desolate, forlorn, and neglected, and one's sympathy naturally flows out to it. Nature does its part to beautify the old pile by methods which are carefully battled against in modern structures; and Nature, having her own sweet way, clothes the rude stones with a more delicate vesture than ever covered the "perfect pile" in all its glory. It is a true sentiment, which resents anything like "restoration" applied to a ruin. No ruin can be restored. The only thing that can be done is to protect it from too rapid decay, and this duty is now better discharged than it used to be in England and elsewhere.

1896. FORTHCOMING EXHIBITIONS.

Sept. 25-Nov. 7	Photographic Salon, Dudley Gallery, Piccadilly. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 28, 29	Lewisham Camera Club. H. M. C. Sprunt, 192, New Cross-road, London, S.E.
,, 28-Nov. 12 ...	Royal Photographic Society. R. Child Bayley, 12, Hanover-square.
December 3, 4.....	Aintree Photographic Society. E. P. Heron, 2 Tilney street, Orrell Park, Aintree, Liverpool.
Dec. 1896-Jan. 1897	Bristol International.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

MR. CHILD BAYLEY (AND OTHER AUTHORITIES) ON ART.

To the EDITORS.

SIR,—I think very few recognise what an extremely clever joke was that paper of Mr. Child Bayley's on *Photographic Societies and Photographic Art*. That our dear old friend Robinson should have gone into hysterics over it is hardly evidence of the fact, for a baby might deceive him, but that such wary birds as Davison, Maskell, and Horsley Hinton should have allowed their tails to be salted in such a simple manner I am surprised at.

Mr. Bayley knows nothing about art, they one and all tell us. Perhaps not, but he has, undoubtedly, a considerable knowledge of human nature, and he has used his knowledge with the most admirable judgment of the weakness of his victims.

Blood and thunder! is this upstart minion of an institution which has dared to succeed, when we have pronounced its extinction, to question our self-constituted authority to decree the fashions in art? No! Let us go for him.

And they go, which was just what he wanted.

The "veteran photographer," let us give him the title he loves, leads the attack, if attack it can be called, for his playful fancy disarms his pen. His heavy artillery are but firework bombs, which, with a loud explosion, burst into a radiant display, then fade into nothingness. His small arms are as dangerous as the confetti of the carnival. Life, to him is one long carnival. He takes nothing seriously, and no one takes him seriously.

The saturnine Maskell treats the matter in an entirely different manner. He evidently recognises the difficulty of the position, and, finding it unassailable, and to make a demonstration, fires bullets into the air, and they fall amongst his allies.

Davison endeavours to make us think he despises his enemy, and, assuming calmness, apostrophises the clouds, but he betrays his agitation. What a childish evasion of the point that was to suggest that Mr. Bayley should produce a work of art as an example. Mr. Bayley was not discussing art as Mr. Davison and they all pretend to infer. He was denouncing the tommy-rot that is inflicted upon us as art-teaching.

Perhaps the most amusing record is that of Horsley Hinton. He flings himself about something after the fashion of a Drury-lane termagant, who, after a night of excess, is being conducted to the police station. There is no beating the hush about him. The matter is a too serious one to him to stand upon punctilios, as he carefully misquotes the paper and the discussion which followed it, and then demolishes the phantoms he has raised.

In congratulating Mr. Child Bayley on his successful production, we ought not to omit to thank the four gentlemen who have played as comedians in the piece. We have enjoyed a hearty laugh at their expense, for which I am sure we all hope they will forgive us.

Secondly, they have all done more than a little towards the advancement of photography in its artistic application, and we appreciate their services in this direction. We may smile at their vanity, but none the less we recognise that in many ways they are worthy of admiration.

In order to give the dear old boy an opportunity of slaying me with his quill, may I sign myself ANOTHER OLD MEMBER.

PHARMACEUTICAL EDUCATION.

To the EDITORS.

GENTLEMEN,—The following conversation between a young Pharmaceutical Chemist and a customer shows the extent of their English.

"A customer asked the chemist if he had any good vinegar, as where he got it last it was poor, although called 40's. The chemist assured him his was very good, being elevens. The customer, knowing a little about specific gravity, could not understand how a vinegar of specific gravity 1·015 could be better than 1·052, but took it and found it very good; next time he asked the chemist if he was sure it was elevens, and he said yes, quite sure, he would show him the invoice, and, lo and behold! on seeing the invoice it was by Hill Evans, the well-known makers—a good specimen of silent H." *Chemist and Druggist*, please quote.

MEDICO.

THE POISONS ACT.

To the EDITORS.

GENTLEMEN,—Will you allow me to point out one or two inaccuracies in your leader in this week's JOURNAL?

1. There is no law "compelling the vendor (of poisons) to be a pharmaceutical chemist." I am not one, and yet am legally qualified to sell any poison on the schedule.

2. No one can sell, as you seem to suggest, methylated spirit in *any* quantity, or of *any quality*, either "old" or "new," unless he be an authorised methylator or licensed retailer.

3. The Pharmaceutical Society does not allow widows of chemists, as such, to carry on the business of their deceased husbands, nor is the widow legally entitled to carry on the business in partnership with a qualified chemist. My mother was a chemist's widow, so I can speak from personal experience.

4. You sneer at the idea of the "safety of the public" being the *raison-d'être* of the Poisons Act. Might I call your attention to the fact that the number of deaths, accidental and otherwise, from unscheduled poisons is on the increase, while those from scheduled poisons are decreasing every year? Take carbolic acid for instance. This article is sold indiscriminately by grocers and oilmen, and the number of deaths caused by it alone averages at present one per day. Is it too much to suppose there is some connexion between the unrestricted sale of this poison and the number of agonising deaths produced by it? Incidentally I may remark that the Pharmaceutical Society have done their best for many years past to get carbolic acid put on the schedule; but you, in the interests of free trading, will be glad to know, without avail. And so victim after victim (some innocently, some with fixed intention) go to their doom, and undergo one of the most horribly cruel deaths it is possible for poor humanity to endure, and all in the name of liberty.—I am, yours, &c., A TRADES UNIONIST.

THE POISONS EXCITEMENT.

To the EDITORS.

GENTLEMEN,—The numerous paragraphs and communications appearing in your last number upon the subject of poison-vending, are calculated to provide considerable amusement for a section of your readers.

Chemists *are* frequently prosecuted by the Medical Defence Association for prescribing, even as photographic dealers are prosecuted by the Pharmaceutical Council, for selling poisons. But I never yet heard of a chemist so legally prosecuted and fined, writing to his trade periodical and kicking up such a ridiculous hullahaloo because the law would not allow him to do just as he pleased.

A chemist on the Continent has a higher status and greater privileges than a chemist in England, but even in England he has a status, a charter, and a title, so that no photographic dealer, not being a legally qualified chemist, may assume the title of "chemist;" neither may the chemist assume the title, not having earned it, of "doctor," without rendering himself liable to prosecution and fine.

But what *is* a "Photographic Dealer?" We find tinkers, tailors, ironmongers, haberdashers, furniture brokers, Jacks-of-all-trades, limited liability riggers, *et hoc genus omne*, cheerfully innocent of chemistry, optics, mechanics, and other collateral sciences, and with a smattering of photography, "going into" the photographic trade on the celebrated "sell-the-goods" principle, as exemplified in the Law Courts, announcing themselves as photographic dealers, and clamouring for the privileges of the chemist without paying the fees, passing the examination, or proving their efficiency in any way whatever. These gentlemen modestly suggest that it may be necessary for such an inferior person as a chemist to be placed under legal restrictions in the vending of poisons, but that such a genius as a photographic dealer ought not to be subjected to the same laws. A photographic dealer is so entirely satisfied as to his own immense personal superiority that to request him to pass an examination would be an outrageous insult.

Your correspondent "Medico" relates an interesting anecdote of a "cutting" chemist who sold a Frena camera at a discount to a customer, but could not show him how to open it. If your correspondent would be kind enough to write and relate the incident to Messrs. Beck & Co., of Cornhill, the proprietors of the Frena camera, they will have a little matter of business to adjust with the "cutting" chemist, who will find that this time he has been so sharp that he has "cut" himself.—I am, yours, &c., PHARMACIAN.

TAKING PHOTOGRAPHS FOR NOTHING.

To the EDITORS.

GENTLEMEN,—What's all the pother about? A firm sending out circulars? Some who choose to accept are forthwith to be held up to scorn, black-listed, or hung right off. By whom, pray? First, your noble selves say they deserve the reprobation of their fellows. For what, Mr. Editor? Why, conducting their own business according to their own lights. Now, what in the world, Mr. Editor, have you got to do with me or my business, I would like to know? Then follows friend "Cosmos," inventor-patentee of the black-list. I rather like "Cosmos," you know; so leave him and his bunkum severely alone. Another growler is the son of the member of a firm who make a practice of placing show-frames in surrounding towns, filled in with a very few choice specimens, which are well worth 21*s.* cabinets and 10*s.* 6*d.* *cartes*, and then how well the party in the town obtains that price for similar work, but they place a very small frame, and very large cabinets 12*s*, *cartes* 5*s.* per dozen. Looks very like throwing stones and

living in glass houses, don't it? Then, a short time ago, friend Robinson was at us, poor d——s, for not joining the Convention or some such gushing so-called outing, for we must be doing poor business, not able to afford a spree once a year; but whisper says, Some of those might have paid their stock-dealers' account, ay, and some of the mashers with snaps in hand paid the tailors. Now, I try to "Mind my own business," "Never find fault with amateurs," but oblige them by turns; pay my way and have an outing when I require one on the quiet.—I am, dear Mr. Editor, ONE OF THE POOR SLAUGHTERED ONES.

P.S.—For your information and the publishers, who have caused the commotion, if the coupon-holder or they expect to get a cabinet for what I charge and get 4*s.* 6*d.* for, why then I take them for——

ABOLISH THE PATENT LAWS.

To the EDITORS.

GENTLEMEN,—Having always considered the technical press an educational force, I feel that those who use that medium to ventilate their ideas should restrain themselves within an educational limit. "Personalities," or "Whose the first foot?" are not instructive, and should have no place in the pages of our technical journals.

Your correspondent, in replying to my cry, *Abolish the Patent Laws*, in last week's issue, has propagated a conundrum I cannot solve. He admits the Patent Law is a fraud—a devics to catch inventors and land them into serious law expenses!—and then he charges me with the nefarious opinion that I advocate stealing other people's brains! and with a barefaced inconsistency advises all inventors to be careful to secure their inventions by patent; for what?—that they may become a prey to the lawyers.

The absurdity of stealing brains! why, one cannot steal brains unless you cut off the head and run away with it; and, as for ideas, they are not a commercial article of property, and, therefore, they are *pro bono publico*—not patentable.

If your correspondent will refer to the opposite page of the JOURNAL, same issue, *re* "*Who Invented Kinetoscope?*" he may learn, practically and personally, a confirmation of what I advanced, urging the removal of all restrictions on progress. I again reassert that the time has come when we must blot out of our dictionaries the word *inventor*. There is, in the present day, no such person possible as an inventor who can truly claim that he arrived at his discovery through the exercise of his individual thought, or that he had not been coached to it by what he had read, or had seen or been told, probably conveniently forgetting all about it. Where, may I ask, does the "stealing" come in? Most certainly with the patentee.

Your correspondent admits logically that the publication of the specification of a patent affords the opportunity to thousands of thieves dodging around to see how much of other peoples' ideas they can appropriate, without getting *run in;* yet, after all, he advises the inventor to have his specification published.

Oh, innocent student of the higher intelligence, you must indeed be very much so, to descry against what we all know to our cost (and some to their profit) is rampant at every hand's-turn; why, the whole population of the entire world are copying or stealing, if you will, from one another whatever they can appropriate profitably.

If we had not our Shakespeare to fall back on, most of our orators would prove very shallow brained indeed, and if it were not for the wide-spread existence of a public press, which has produced this higher intelligence of which my friend complains, there would be fewer patentees of the mushroom hot-bed sort.—I am, yours, &c.,

Dublin. JOSEPH LEWIS (a plural patentee).

COLE'S RISING AND FALLING FRONT.

To the EDITORS.

GENTLEMEN,—After considerable trouble and expense to me in bringing out and perfecting the patent (both English and American) of my flexible rising and falling front for cameras, and after the eulogistic opinions of the same by the whole of the photographic press, I need hardly tell you how astonished I was at reading the statements contained in your issue of January 17 last (which apparently was attributable to Mr. Foxlee, when he showed the model of a camera front which had been made by Mr. Hare), 'that it included all the salient features of a new patent camera which had been recently exhibited at the Club;' and, again, in your issue of February 7 last, that this same model, which Mr. Hare then presented to the Club, 'contained the principle of a newly patented camera which had been recently shown to the members, and for which claims of originality had been made and contested by certain members.' These remarks applied to my patent, and I felt at the time that they were most unjust, as the model referred to does not, in any way, contain any of the principles of my camera, but I took no further notice of it until it was drawn most clearly to my attention that the statements made were doing me irreparable injury, as I found than certain manufacturers before whom I placed the camera for sale had stated that "the idea had been played out for a number of years," and refused to entertain my application to them, giving as their authority and reasons the statements before mentioned, *which they believed to be true*, and *that Mr. Hare's model was identical with my flexible front.*

This being so, I then took steps to bring the matter before Mr. Foxlee, and also wrote to the Hon. Secretary of the Photographic Club on the subject, who read my letter to the members of the Club at a meeting held on August 5 last, with the result that the members (including Mr. Foxlee himself) unanimously came to the conclusion that Mr. Hare's model *was not* the same as my invention, and the Hon. Secretary of the Club wrote me a letter in these words: "I was instructed to write you that it was the unanimous opinion of the members present that the rising and falling front model presented to the Club by Mr. Hare is *not* the same as your invention."

This, to an extent, was satisfactory to me, as showing that a mistake had been made, although it has not, up to the present, removed the damage done me, as any statements emanating from such a Club (bearing the highest reputation, as the Photographic Club does) are naturally taken for granted by the rest of the world (who have not an opportunity to judge for themselves) to be correct and well founded; but I hope, by the publicity that has been given to the contradiction, that I may have the benefit due to me for the *originality of my patent* and the labour bestowed upon it. I was very pleased to note in your issue of August 24 last that Mr. H. C. Rapson had called attention to this subject, for which I thank him.

I may mention that the Judges at the Stanley Show of 1895 recognised its value and awarded it the silver medal.

Thanking you for having allowed me to take up so much of your valuable space, I am, yours, &c., JAMES COLE.

FREE LANTERN LECTURES FOR SCHOOLS, &c.

To the EDITORS.

GENTLEMEN,—Last year, through your courtesy, we were able to draw the attention of your readers to an effort we were making to provide Board and National schools, evening classes, temperance and religious societies, Y.M.C.A.'s, Colleges, &c., with lantern lectures. As a result, we had many applications from teachers and others anxious to use these lectures and slides. Knowing the difficulty which many teachers experience in finding subjects likely to be of interest to their pupils, &c., we have been encouraged by last year's experience to once more make the same offer. This season we are sending out two new lectures, respectively entitled *Behind the Scenes of Popular Journalism* and *Popular Authors and their Work*, each of which, we think, will provide a pleasant evening's entertainment. Both subjects have a distinctly educational value, and, whilst being amusing, the lectures have in them nothing that could offend the most fastidious taste.

Will you permit us to say that we shall be happy to loan these lectures and slides to any of your readers who may like them during the coming season. We shall be delighted to send conditions and full particulars on receipt of a stamped, addressed envelope.—We are, yours, &c.,

GEORGE NEWNES, LIMITED.

9, 10, *and* 11, *Southampton-street, Strand, W.C., September* 16, 1896.

A CORRECTION.

To the EDITORS.

GENTLEMEN,—I find that, when criticising R. E. Liesegang's article on *The Solarisation of Dry Plates* in your issue of August 28, 1896, p. 554, I did not quite grasp the correct meaning of one of his statements, and regret that, in consequence, I misquoted him, and made one or two unnecessarily sharp remarks.

In the translation which I was using (THE BRITISH JOURNAL OF PHOTOGRAPHY, June 12, 1896), the sentence in question is rendered: "It is impossible to prove or to controvert this theory of solarisation, in the development of dry plates, by experiment, either by exposure through the back or by stripping the gelatine film from the glass before development." On comparison with the original, I find that a rather clearer rendering of the meaning would be as follows: "The experiment of exposing the plate from the back or of stripping the gelatine film from the glass before development will not prove or disprove the correctness of this theory of solarisation."

My misquotation does not affect the line of argument I was using.—I am, yours, &c., F. KROHN.

Wealdstom, R.S.O., September 21, 1896.

A WARNING.

To the EDITORS.

GENTLEMEN,—A man, described as about five feet ten inches high, with brown hair and sandy whiskers, wearing a black coat and waistcoat, and brown trowsers, carrying a flat case, covered with oilcloth, similar to an ordinary club-picture canvasser, has been going around Aberdare and suburbs, from house to house, inquiring if any one had any photo-

graphs they would like to have copied. The price to be 1*s.*, and the work would be brought in one week.

He would ask for prepayment, and, on being asked his name and address, he said he was agent to Lendon Berry, & Co., of Commercial-street, Aberdare, but did not give his own name and address. He obtained 6*d.* each from two different persons, who have applied to us for the work, as the man has not brought it to them according to his promise, and they were very much put out on finding that we had no such person in our employ.

As it is likely this swindler is still pursuing his nefarious occupation in this or neighbouring districts, we have no doubt, if you will kindly insert this letter in your paper, it may stop his little game by drawing the eyes of professionals to any one answering the above description, and, if we can get on his track, we will most certainly prosecute him for using our name for such a purpose.—We are, yours, &c.,

LENDON BERRY & Co.

The Globe Studio, 47, Commercial-street, Aberdare, South Wales.
September 15, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Albert Georga Lewis, 62, Shaw Heath, Stockport.—*Photograph of Stockport Rugby Football Club mounted on advertisement sheet.*

Charles Henry Evans, 12, St. Helens-road, Swansea.—*Six photographs of children.*

Thomas A. Moryson, Montagne-place, Dumfries.—*Photograph of Robert Burns's tomb, called mausoleum, at Dumfries, Scotland.*

RECEIVED.—PHARMACIAN; J. LEWIS (Dublin); H. WRAGG; and others.

STUDIO BLINDS.—R. STOCKER. The lighter material of the two sent will be the more suitable for blinds during the winter months. For the summer the darker would be the better.

ROYAL ARMS.—S. E. G. The photographs being accepted, and a note of approval and thanks received in return, does not entitle you to the use of the Royal Arms, even on your circulars.

PORTRAITS AT NIGHT.—S. STEPHENS. If the current is laid on in your street, by all means adopt the arc light in preference to a number of incandescent gas lights. It will cost more to instal, but that will be amply repaid by the extra convenience and utility in working.

BLOOD ALBUMEN.—W. COX. Blood albumen is largely used by calico printers, and it is usually supplied by the makers in large quantities only. It is, however, to be had of many drysalters in London. Skilbeck Brothers, Upper Thames-street, will probably supply you with a few pounds at a time.

PRINTING BY ARTIFICIAL LIGHT.—T. MICHELL. Printing-out papers can be printed by the electric light, but the exposure will be very long, which will, of course, make the work very costly. Still, it is possible. If the work must be done by artificial light, will not one or other of the development methods answer?

LENSES.—PIE RAPRONE TE. All the lenses named are good. That numbered 2 is slower in action than the others when they are worked with their full aperture. The maker whose lens you have returned also has a good name. It is against our rule to recommend any particular maker's goods in preference to any others.

PROCESS WORK.—EXPERIMENT. Although wire gauze, muslin, crape, netting, &c., were used by the early workers, or rather experimentalists, they have now all been discarded for the ruled screen. You had better obtain a properly ruled screen for your experiments. A small one—say the half-plate size—is not a costly affair.

PROCESS NEGATIVES.—S. WARMAN. The sale of collodion is not prohibited, and there is no difficulty in getting it, for negatives, for process work. Indeed, few negatives are taken, for that process, that are not on collodion. Apply to Mawson & Swan; they will supply you with any quantity. There are some restrictions as to its carriage by railway, but they are not great.

WETTED NEGATIVE.—C. WHITE. If the wet negative, with the paper in contact with it, was allowed to remain for several days, and become dry, there is little doubt the negative is utterly ruined. The paper may be got off by soaking in water, and then carefully rubbing it off; but the stains on the negative, we fear, are not to be got rid of. A solution of cyanide of potassium may be tried, however.

SHUTTER. T. TODD sends us a drawing of an instantaneous shutter, and asks us if it is sufficiently novel for him to secure a patent for it. He can certainly obtain a patent for it, supposing no one opposes the sealing of it; but we should be sorry to express any opinion as to the validity of the patent in face of the hundreds of shutters that have from time to time been described or patented.

PROCESS WORK.—EXPERIMENT. If the example sent is the sharpest negative the lens will take with *f*-48, it is no use for process work. The screen is only sharp for a few square inches in the centre of the negative. You might try with a still smaller stop, and focus more towards the margin of the plate; but, any way, you cannot make it cover the size of plate you desire. You must get one with longer focus and a flatter field for process work.

CARBON PRINTING.—CARBON NOVICE. We cannot understand the tissue being insoluble immediately it is dry, when it was dried "within the space of seven hours in a perfectly pure atmosphere." It certainly should not be so. The only thing we can suggest is that there was something wrong with the bichromate—perhaps unduly acid. Try the addition of a drachm or two of liquor ammoniæ to each pint of the solution, and do not let the temperature of the drying room exceed 70° Fahr.

ENLARGED NEGATIVE.—J. A. T. asks: "Can you inform me how to make a large negative from a small one?"—Make a transparency from the small negative, either by contact printing on a dry plate or on carbon tissue, and from that make the negative the size desired in the enlarging camera. Any elementary work on photography will give the working details. We should have thought the firm on whose memo paper you put the paper would have given you the desired information.

STAINED NEGATIVES.—J. C. DUNK. The occurrence is by no means uncommon with much-under-exposed plates when they are much forced in the development and a large quantity of ammonia is used, as in your case. The stain is exaggerated if the dark-room light is not perfectly safe, and the negative is frequently examined by it. So it is if, between the development and fixing, it is exposed to white light. Nothing can be done to improve the negatives now except by reproducing them; then, if all the detail is there, quicker printing ones may be obtained.

INSTANTANEOUS WORK IN WINTER.—THOS. WADE. The quickest lenses for winter would be the portrait combination, of which there are different grades of rapidity. The quickest series is that known as "baby lenses," and have an aperture of nearly *f*-2. The next is the *carte* series, with an aperture a little less than *f*-3. The ordinary portrait lens comes next, with an aperture of about *f*-4. All these lenses are bulky for the size of plate they cover, and have little "depth of focus" when worked with the full aperture. Still, they are useful tools when rapidity is the main thing to be considered.

PHOTOGRAPHING BY ARTIFICIAL LIGHT.—B. & Co. write: "We have the opportunity of taking photographs of a very important meeting to be held in the Town Hall here. The Hall is lighted by half a dozen arc lights, and, from experiments we have made, we anticipate no very great difficulty, except in one corner, which the light does not fairly reach, and it is here that some of the most notable people will be. Can you give us a hint or two?"—If it is impossible to add temporarily another arc light to illuminate that portion of the building, the only thing we can suggest is to use a flashlight at the end of the exposure, directing it by a reflector in the direction required. If you adopt this plan, take care to intimate to the meeting what is going to be done, or the flash might create a panic in the building, with serious result.

YELLOW STAIN.—E. J. W. says: "During the last fortnight I have toned three times, and each time about a quarter of the prints have had a yellow tinge on them; the treatment has been exactly the same as previously using Ilford formulæ. Can you suggest a remedy? Would the damp weather be the cause? I enclose photo showing the defect?"—It is difficult to say the cause without seeing the work carried out. As a fourth of the prints only are stained, it is clear that it is not the fault of the paper; hence, it must be due to the manipulation, but in what way it is impossible to say. Possibly it may be the use of too weak a solution of hyposulphite or too little of it; or the prints, not being kept in motion while in the fixing bath, may account for the trouble. We do not suppose the damp weather has anything to do with the trouble.

SPOTS ON ALBUMEN PAPER.—PERPLEXED writes: "Will you please tell me what you imagine to be the cause of black (apparently metallic) spots on enclosed sensitised paper. I have been greatly troubled with them lately. They do not appear on the paper at all till after it is sensitised and before it is printed. The sensitising room is kept as free from dust as possible. Do you think it is caused in any way by the blotting-paper used after paper has been floated? By giving your valuable opinion on the matter you will very greatly oblige."—The spots are due to reduced silver. Metallic particles in the paper itself would produce similar spots, but these are not due to that cause, as they do not show strongly enough on the back. They appear to be rather due to a particle of some pernicious matter coming in contact with the albumen surface after it is sensitised and while wet. Dust from sulphate of iron, pyrogallic acid, or similar reducing agents, would produce similar spots, so would metallic particles in the paper with which the albumen surface is blotted. We should advise a change in the blotting-paper. Get a sample of chemically pure paper from some of the operating chemists. Commercial blotting-paper is rarely suitable for photographic purposes. Marion & Co. supply an excellent blotting-paper.

*** Several answers to correspondents unavoidably held over.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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EX CATHEDRÂ.

The Research Fund of the Photographic Convention of the United Kingdom has so far not been availed of, and the scheme seems virtually a dead letter. There is a feeling that this is due to the fact of the rules governing the administration of the Fund being unsuitable. At present, application for a grant in aid has to be made by the person proposing to take up a certain line of work, and, though in theory this arrangement seems a good one, there are cases in which a natural reluctance to make application will render the rule unworkable. We believe the Convention executive is to be invited to amend the rules relating to the Research Fund so as to place in the hands of the Council the power of making bestowals of grants, instead of waiting for applications. By giving the Council a free hand in this matter, it is felt that the scheme will work more satisfactorily than hitherto.

* * *

As already announced, the Annual General Meeting of the Photographic Copyright Union will be held on Thursday, October 8, at eight p.m., at St. James's Hall (French Salon). The entrance is in Piccadilly. We hope that a large number of members will attend and demonstrate by their presence their interest in so useful a Society as the Copyright Union.

* * *

A pleasant reminder of the Leeds Convention reaches us from Messrs. Wellington & Ward, of Elstree, who send us a number of photographs of Bolton Abbey and York Minster. These were taken by Mr. Wellington himself. The prints, which are excellent, are on the firm's matt bromide paper. The chief point of interest, however, lies in the fact that all the negatives (which, with so able a worker as Mr. Wellington, are, it is needless to say, of exceptionally good quality) were taken on negative bromide paper. Critically examined, the definition appears to be exceedingly crisp, which is a strong point in favour of the paper; indeed, but for the knowledge that negative paper had been employed, it would be difficult to tell that the beautiful views of York and its fine old Minster were not made on glass plates.

* * *

Our daily correspondence indicates the existence of so much interest in the alleged discovery of photography in natural colours by Mr. J. W. Bennetto of Newquay, that we here give an account of the present position of the controversy. It may be remembered that a fortnight ago the subject was extensively referred to in our columns. We criticised the test to which Mr. Bennetto had been subjected, and not only termed it unscientific, but doubted the qualifications of the Committee appointed to conduct that test and to judge of the results. The last number of our Newquay contemporary, while making other extracts from our columns, overlooks this criticism, and takes occasion to "regret" that we did not accept a strange challenge that was made to us, and that has absolutely no bearing on the question whether Mr. Bennetto has, or has not, discovered photography in natural colours.

* * *

An old contributor to these pages, Mr. G. R. Baker, writes to our contemporary in a favourable strain of the quality of Mr. Bennetto's projected transparencies, and characterises the results as beautiful. We obtain no clue, however, as to the details of the process. The mere inspection of coloured lantern slides projected on to a screen is not sufficient to validate the remarkable claims that have been made by and on behalf of Mr. Bennetto. The very latest development of matters is to

be found in the letter, a copy of which we append, that was addressed to us personally.

* * *

The writer, Mr. A. Bluett, of 3, Dereham-terrace, Truro, says: "Mr. Bullmore tells me that you have shown some interest in Mr. Wallace Bennetto's alleged discovery of colour photography. As representative of the *Western Daily Mercury*, I have made an appointment with Mr. Bennetto to see his productions on Monday evening. Perhaps you will consider it worth your while to ask one of your representatives to meet me in Newquay on Monday with the idea of our making a joint *investigation*."

* * *

To this courteous letter the following reply was sent: "If you are to have an opportunity of examining the photographs in natural colours, and of witnessing and having explained to you the actual process by which Mr. Bennetto produces his results, I have no doubt that either Mr. G. G. Bullmore, of Newquay, or Mr. F. Waren, photographer, of the same town, would be pleased to join you on my behalf. Will you, if necessary, present this letter to one of those gentlemen? If, on the other hand, you are simply to witness a series of projected transparencies, no useful purpose can be served by my being represented."

* * *

We continue to receive copies of West of England newspapers, and communications from other sources, containing descriptive accounts of the beauty of Mr. Bennetto's transparencies in "natural colours;" but we look in vain for any information bearing upon the details of the process by which these results are said to be obtained. Until that information is forthcoming we shall maintain an attitude of what Mr. Bennetto himself has termed "reasonable scepticism" towards claims which, however persistently urged and reiterated, are at present lacking in the not unimportant essentials of independent verification and substantiation.

* * *

Mr. E. Cecil Hertslet, a well-known member of the Royal Photographic Society, upon the Council of which he was elected some few months ago, has received the appointment of Consul General of Her Britannic Majesty at Havre, France. While we congratulate Mr. Hertslet upon his appointment, we shall be sorry to miss his presence at the Society meetings, at which he was a regular attendant. He will leave this country in the course of the next few weeks.

THE CARRIAGE OF PHOTOGRAPHIC GOODS.

A letter which we recently published from a correspondent who had, he believed, a cause of complaint against a railway company for damage to a parcel of plates has led us to make some inquiries to enable us to put before those of our readers who have not much experience of the commercial aspect of photography, some useful information on the subject. Many of the railway charges seem exorbitant and often unjust, which, upon explanation, may prove to be both just and reasonable.

We will take, at the outset, the particular case in question. There is first to be considered which is the aggrieved party when damage is done? It is generally understood that, if a claim lie at all, it is by the person who makes the contract, and that is assumed to be the one who pays, or is to pay, the carriage. The next point is, When a claim can be made. This depends upon the way the goods were delivered to the company. The carriers have two classes of charges for most goods—goods carried at owner's, and those carried at sender's risk—the latter being considerably cheaper than the former. The essence of this understanding is that, when the carrying is at owner's risk, no claim can be entertained unless there is clear proof of improper treatment by the carriers; and there is rarely any clear enough case of the kind, unless the package bears external marks of violence, in which case there is little doubt that the company interested would make good any injury to a package or its contents, if it could be shown that they left the sender in good condition.

When the carrying is at company's risk, any damage that the goods receive may be claimed for, if it can be shown, without reasonable doubt, that the goods left the sender in good condition and properly packed.

There is an important point to bear in mind. There are about seven different classes into which goods are divided by the railway authorities (and it may be noted that all have the same rules and the same classification), and it is most desirable that, when the contents of a case or other package are of a fragile character, the fact should be notified, for in the case of a breakage all redress would be refused, and justly, if the goods are of a more risky character than they are declared to be. We believe it is a common practice with many, when sending single glass pictures, or a few negatives, by passenger train, to omit marking the wrapper with the word "glass." This involves an increased charge of twenty-five or fifty per cent., so the risk is taken; but, if there be damage, and there be no indication of the nature of the contents, no claim for damages will lie, because the carriers were not warned, and so took no extra precautions to ensure safe carriage.

We have spoken of sending by "passenger train;" there is, however, another mode, namely, by "goods train," and many people are puzzled as to what the difference is. It consists mainly in the facts, firstly, that there is usually only one goods dispatch in the day, while passenger-train parcels go by almost every passenger train during the day; and, secondly, goods dispatch is usually cheaper. It is, indeed, considerably cheaper for large parcels; but there is a fixed minimum charge, which may exceed the passenger-train rate for parcels of few pounds' weight only, and it is in such circumstances that complaint of over-charge is often made. Further, a consignment may often take twice as long to deliver by goods dispatch as by passenger.

Some of the differences in practice may here be noted. The railway companies require an invoice delivered to them for goods, but not for passenger parcels; and, so long as a recognisable distinctive mark is placed on the cases, it is immaterial whether they are addressed or not, so long as the invoice contains the address for "goods.' Again, when several packages of a kind are sent at one time to one consignee, their united weight only is charged by goods dispatch, while with passenger parcels each parcel or packet is charged separately.

It may have been noted that, when questions of claim for damage arise, both services are alike in the fact that no claim is allowable without insurance if the consignment exceed 10*l.* in value, unless under certain exceptional conditions.

Insurance varies from sixpence to half-a crown for 25*l.*, value according to the nature of the articles. From them we may

extract negatives which come under Class II.; pictures and paintings, and "glass of all kinds," except certain special articles, Class III.

There is, finally, the question of "empties" to be considered, and a subject that is frequently the cause of much heartburning and annoyance. Primarily, the sender of an empty has to pay the company, but sometimes, to regular customers, they will consent to claim the carriage from the consignee. If, however, he is unwilling to pay, he should simply decline to do so, and refer the carrier to sender. Carriers have a lien upon goods for the value of the carriage charge, but, as empties are often of little value, they prefer the system of requiring the sender to pay. It may be noted, as a very vexatious system, that for empty crates, so often used by photographers for parcels of frames, &c., the companies make besides a minimum charge of one shilling, whether the distance be small or great.

We think we have now exhausted all ordinary questions, and we trust our readers may find our compilation of some practical benefit.

The National Gallery.—From last Sunday, it is announced, the National Gallery and the National Portrait Gallery will be closed on Sundays during the winter months. A special meeting of the Sunday Society was held on Saturday to memorialise the Trustees on the subject. The reason assigned for the Sunday closing for the winter is the absence of artificial light in the buildings. Although the attendance at both Galleries has been good since the Sunday openings, we doubt if the Trustees will consider that it has been sufficient to warrant them in installing artificial light simply for Sunday visitors during the winter months, the more especially as they did not take altogether kindly to the project in the first instance.

Shutter Patents.—We have been asked several times during the past few weeks to express, in the Answers column, opinions as to the originality of shutters, descriptions of which accompanied the queries. Of course we have declined, as we always do, to give opinions on such points. If we did so, it would involve an immense amount of research at the Patent Office. It may, however, be interesting to our readers, especially to those who have written on the subject, to know that reference to the "subject-matter" index at the Patent Office shows that, during the period 1885-91 inclusive, no less than one hundred and thirty-seven patents in connexion with photographic shutters were taken out. This is exclusive of the provisional protections which were granted and the patents not completed, or the descriptions of others in the journals, and for which no patents were sought. In the seven years named, the number of patents mentioned above were actually sealed.

Process Block Illustrations.—Our facetious contemporary, *Punch*, has always been noted for the excellence of its illustrations, as well as the artistic merit connected with them. The drawing of the current artists—Tenniel, Du Maurier, and others, as well as J. Leach and others in the past, are evidence of that. A few weeks back *Punch* made a new departure, and introduced two or three half-tone process blocks from wash drawings, amongst its other, and old-style, illustrations. The contrast was striking. How they were appreciated by the readers, it is, of course, impossible for us to say; but, as this style of work has not appeared since, we conclude that it was only introduced as an experiment. If our contemporary intends, successfully, to adopt half-tone process blocks in place of its well-known sketchy line illustrations, it will have to adapt its printing department—machines, paper, ink, &c.—specially to suit that class of work, to say nothing about the artists' original drawings.

Exhibition of Miniatures. — The Society of Miniature Painters, to which we referred a few weeks back, has opened its inaugural Exhibition at 175 New Bond-street. Photographic portraitists will do well to pay it a visit to see what is yet possible with miniature painting. There are some two hundred and fifty exhibits, some of which are of exceptional merit. Although there are not any Cosways, Shellys, Collinses, &c., there is sufficient good work, including that of some by R. A.'s, to prove that miniature work is by no means the lost art that some have imagined. Photography, and the high-class coloured photographs once obtainable, no doubt, killed miniature painting or, at least, that of the "Miss La Creevy" type; but what, it may be asked, caused the practical demise of the high-class coloured photographs which have now become as rare as miniature paintings?

The British Association. — The 1896 meeting of the British Association is now a thing of the past. At Liverpool nothing relating especially to photography took place, nor has photography, except as an adjunct to other matters, figured at any of the meetings for some years past. We were somewhat surprised that the metric system of weights and measures did not find the support we should have expected it would from a scientific body. We expect that not much of real value is to be accomplished at the meetings of this Association. It is practically a fashionable pleasure outing, and "science and learning" are an excuse for holding them. It is true that papers are read, and others are taken as read, but, in a sense, the meetings are very much like those of the Photographic Convention — excursions are generally better attended than the meetings. The next meeting of the Association is to be held at Toronto, under the presidency of Sir John Evans.

Processes at the Exhibition.—The annual Exhibitions of the Royal Photographic Society are generally looked upon as indicating by the pictures shown, and the printing processes by which they are produced, the direction in which photographic taste and ideas are running year by year. With regard to the processes, they must by no means be taken as indicating what is being done commercially in photography. This year there are 346 frames shown, as against 459 last year, roughly a hundred less—practically one-fourth less. This year there are, according to the catalogue, when the process by which the pictures were made is mentioned, 146 platinotypes, as against 176 last year, practically the same proportion; in carbon, 92, as against 110, a slight increase; bromides, 27—last year there were but 26, hence there is a material increase in them. Last year there were 41 gelatino-chlorides, but this year only 8. Of "silver," which are supposed to include albumen, "platinum-toned," and other silver methods, not including gelatino-chloride and bromide, there are 13 as against about double that number last year. There is a very marked falling off in photogravure exhibits. Last year there were 22, while this year the number can be counted on the fingers of one hand, and yet have some to spare.

As mentioned above, the proportions of processes one to the other, as represented at the Exhibition, must not be taken as at all showing what is done commercially in every-day work. In the Exhibition the largest proportion of the work is in platinum, and next comes carbon, while gelatino-chlorides and "silver" are but feebly represented; yet we know that each of these methods is far more largely worked than are the other two put together, and the makers of these different papers tell us that the sale of them was never greater than it is now. Collodio-chloride is not even mentioned in the catalogue, but every one knows that that is now commanding a large and increasing sale. Bromide, again, figures less prominently than platinum in the Exhibition, but the quantity of the former paper used, as against the latter, is immeasurably greater, so, also, in the case of carbon, where the difference is still greater. We mention this as, from the catalogue, foreign photographers and those in out-of-the-way places in this country might imagine that the ordinary methods of silver had almost become extinct in this country.

DIGRESSIONS.

X.—From a Window at Broadstairs.

At this delightful little watering-place, between Margate and Ramsgate—yet not of them—are three objects, beloved by photographers as subjects. One is an arch, in a narrow street going down to the harbour; the next, not far off, is the jetty and the boats; and the third, the little curved bay, with its fringe of tents under the cliffs, its bathing machines, niggers, the photographer who, by the courteous manner of his touting, makes the lower rank of the profession honourable, and the holiday crowd, always there in the season, from early morn till dewy eve, no matter the state of the tide. This foreground is backed by the picturesque part of the town, the jetty, and the harbour, surmounted by Bleak House, which was once the home of Charles Dickens. This charming view is seen from the terrace on the edge of the cliffs, which does duty as a promenade. On this terrace is a handsome band stand, in which plays, much too often, a by no means proficient town band. This, I hear, is to be remedied. In the intervals of exhaustion of the band, the musical riot is continued by barrel-organ fiends. My window is near the stand, and, as I write, I confess to wishing that, when "Music, heavenly maid, was young," she had gone for a bathe, and got out of her depth.

But everything has its compensations, good or bad, and my window looks out upon the standpoint, on the terrace, from which the grand view of the place is to be had, and affords me much to cogitate upon. It shows me these curious and gratifying facts, among other things: That the new boom in cycling has not quite extinguished amateur photography; that hand cameras do not yet equal stand cameras in number, at which I am surprised; that 10 by 8 and whole-plate cameras are still used, but sparingly; that the half-plate is not so popular as it was; and that the average number of those who take this particular view, at this time of the year, is about a daily dozen. One day I counted twenty-three, and there must have been some who escaped my notice.

The methods of working vary as curiously as did Garrick's face when he sat to Gainsborough, but there are few exceptions in the practice of the photographers in one important particular, nearly all show that excessive care and fidgetiness which come from doubt and want of knowledge.

Our view is an obvious picture; there is very little to choose about it. It is difficult to make a mistake in selection. Yet few are able to "see" it at once; and none appear to have that assured confidence which enables a man to "come, see, and conquer." Many put up their cameras on their stands as if they enjoyed dallying with their apparatus, look at the focussing screen, shift a foot or two (or perhaps a few yards), are very careful to get the right amount of foreground, still more careful to see that the camera is level (by instrument), consult a friend, adjust the shutter and the stops, and then give it up and go away. All this trouble is part of the holiday, but confidence does not run to the price of a plate. They come again another day, and go through the same performance. I have seen one man do it four times. The last time he did venture to expose, then out came the note book, and the whole history of the case was written down.

Now, I like a photographer to think over his work, but I do not care to see him puzzled, fuddled in thought, for want of knowing how to think, or apparently wanting in knowledge of how to use his material for thought. The artist will see his picture without any reference to his camera, until he wants it for use, and only looks at the ground glass to make the necessary adjustments.

I mentioned the note book. This taking of notes is very praiseworthy, if it is not carried too far and made to interfere with essentials, but it is the second barrel that often brings down the bird, and this opportunity is sometimes lost in writing down the true and particular history of how the first shot was missed. A photographer once showed me a large volume in which the whole history of every plate he ever exposed was carefully entered on business principles. This was the ledger into which the day book was posted. It was as particular and minute as Pepys' *Diary*. (How that learned F.R.S. would have revelled in photography! He would surely have spent another annual guinea, and become F.R.P.S. as well!) My friend was more proud of this book of his than of anything else he had ever done, and rightly. It was a monument of patient, if useless, industry; it was the best of its kind. His photographs were never known to exceed the "usual thing."

Before leaving our bay as seen from the terrace, I should like to mention that one of the most lovely sights I know is this view as seen in the gloaming on a suitable evening. It is a fine example of what is meant by the word "tone;" of the variety and harmony there can be in greys. The jetty is the dominant note; it is a picturesque mass, jutting out into the sea, tarred, and therefore black, but put up your hat before it, and you will find that distance and the fading light have ethereal ised the black into a lovely dark, rich purple colour, surrounded by the varying yellow greys of the sea, in which are streaks and masses of cold blue; the sky has been of a cool grey tone, but is now turning to a misty warm grey over the horizon. The powerful dark of the jetty is repeated, but of a greener tint, in the trees mingled with the warm brick houses of the town, the lighter cool grey of the chalk cliffs gives value and breadth; Bleak House, an ordinary brick building in daylight, seems in the fading light like a grand mediæval tower protecting the harbour, and the fine breadth of life-deserted sands, with their beautiful pattern of seaweed fringing the margin of the tide limit, repeats and echoes the numberless tones of the rest of the picture, and completes the harmony; and now, as the evening deepens, the half moon becomes visible in the south-west, and the jetty lights appear. The dying after-glow throws a mellow tone over the effect and gives a fairy-like aspect to the scene.

I don't know if this is photographic. I have not tried a plate upon it, because I have not quite mastered the two-years'-studied time arrangement of my camera, but if you will seek the causes which produce such effects, and try to appreciate them at their artistic worth, you will become a better photographer.

Others of those who entertain me unawares have their own peculiarities. Some are content with a view-meter, or a brilliant finder. Last week one seemed to be exposing a long time, and curiosity led me to run down from my observatory to see what he was doing. He was photographing a holiday crowd with a pinhole! I ran away for fear of being offensively hilarious. I know there are those who believe in the formula *f*-64, $\frac{1}{100}$ *s.* (I regret I have forgotten the H. & D. number), for snap-shots in a dark cathedral. How can you catch the fleeting smile of the marble angels if you are not quick? Perhaps it was Mr. Nicholson, whose brilliant imagination conceived *The Cricketer* last year, and whose skilful fingers executed it. He must have been working for the Salon. I could easily believe this to be his method. He looked like a humourist.

With the exception of this last, the prevailing characteristic of the holiday photographer is certainly "doubt." He dreads bowling wides and no balls, and will take no risks on the off chance of getting a wicket. He seldom seems to know when he has got a subject, still less does he know what to do with it when it dawns upon him, possibly because our view is not a church, a castle, or other bit of architecture. One of the other of our three subjects is much more patronised. This is the arch. This arch is neither picturesque nor particularly interesting, architecturally or historically, but it is an "object" of the familiar kind, and he is safe. It spans the street leading to the harbour, and I never go through it without getting in the way of a photographer.

One day I ventured to open a conversation with one of these "bold camera-wielders," as the scoffing Gleeson White, who "sins against knowledge," calls the much critic-enduring photographer. He had more workmanlike tools, and seemed more experienced, than the others; still, he appeared to have much difficulty in making up his mind. I was glad to find he had practised our art in the "wet" days, and had never severed the continuity. He seemed pleased to show that, though an old photographer, he was up to date. He told me that he still attended lectures on the science at a great institution. He gave me the names of his teachers; they were all scientists. He talked to me of things as connected with photography of which I knew nothing—eclipses and Röntgen rays, as well as of the brilliant defining power of the latest developer on which his Professor had lectured, and he seemed to know an unreasonable lot about

lenses, of which he carried a battery; but he had never thought picture-making worth a lesson, although picture-making was his object.

There ought to be a moral, and I think it is clear. This *doubt*, with which most photographers are troubled, comes of ignorance. They are full of knowledge up to the throat, but of a useless sort, very little indeed of the kind being required on the mission on which they are bent as they roam the country. Their object may not be to produce the highest class of work, but they certainly desire to make their photographs as like pictures as possible; yet they study almost everything systematically, except the one essential—picture-making—and cannot *see* a picture even when the materials are hitting them in the eye.

As I have hinted above, there is one part of my present camera that I don't understand, but which is a source of perpetual intellectual diversion to me. The study of it is as interesting, and about as useful, as endeavouring to learn art from photographs without any aid from books or other teaching, as recommended by a scientific lecturer connected with the Royal Photographic Society a few months ago—a method which was actually backed up by one or two other scientists, which possibly may let some light on to the quality of their results—when any.

Besides all the other ingenious contrivances in my camera is an arrangement for time exposures. Time exposures with a hand camera are not likely to be of very much use to me; but I am so far a scientist that I like to "know you know" to a moderate extent, and in leisure moments rejoice in a knotty problem, if it is not too absurdly useless, as many of them are. The proper working of this time exposure depends upon the exact position and relation to each other of two little knobs or balls, which in the printed directions are called H and O, as if they were two of the elements. They have to revolve round each other, while something else is looking the other way; the rest of the drama takes place inside the box, where you cannot see what goes on. It happens that mine is one of that remarkable kind of cameras which shake themselves together and are born again every January 1, and become the pattern for the next year—an ingenious business renaissance which makes cameras second-hand before their time. Now, it is unfortunate that my camera and the "book of the words" I possess were not born in the same year, so that when the "directions for use" call the tune the knobs won't dance, and, as I have said, I have here a source of continual enjoyment which was not charged for in the price of the camera, and will last me all the camera's life, which I am afraid won't be long, yet I have a sentimental objection to seeing it become second-hand.

If sound could be blended with printed words, there ought to be found the mingled harmony of the following noises running through these lines: the prevailing "music" from the band stand under my windows produced by a shrill piccolo and a badly played and intermittent ophicleide; the sweet melody of the "intermezzo" on the barrel organ, of which I have had three weeks on end; the sleepy swish of the waves as the calm tide comes in; the rustle and drowsy hum of the crowd as they pass my window; and all this not without a slight sensation of the whisper of horror that runs through the holiday promenaders as the remains of the man who fell over the cliff are rowed across the bay to the landing-place.

H. P. Robinson.

THE TREATMENT OF OVER-EXPOSED PRINTS.*

For the purposes of this method the over-printed proofs should be well washed and fixed in fresh hypo, and again thoroughly washed. For bleaching, a weak solution of bichromate of potash, to which a few drops of hydrochloric acid have been added, is preferable to either cupric, ferric, or mercuric chloride, though these may be used. In any case a very thorough washing should be given before redevelopment, and the prints should not be unnecessarily exposed to strong light. A certain amount of exposure is necessary in order to secure the tone on redevelopment, and it is on this account that the chromic salt and hydrochloric acid treatment is preferable to either of the others, since it forms an image in pure chloride of silver which is capable of rendering a faintly visible image on exposure to light. In the other cases the presence of other matters in conjunction with the silver chloride renders the formation of a visible image a matter of uncertainty, and in the case of mercuric chloride an impossibility, while the foreign matter also has a bad effect on the subsequent tones.

Let the proofs be exposed to diffused light until the picture is faintly seen in all its details, and then proceed to develop with the usual developer recommended for partially printed-out proofs. The one I have found to answer for all general purposes is that given by the Eastman Company for use with their printing-out paper, and consists of hydroquinone with a large dose of soluble bromide, but I omit the tannic acid as a useless complication. With this solution the picture is redeveloped in a very gradual manner, appearing, in all its details, very faintly at first, and slowly gaining strength; its progress can be stopped when the proper point is reached, and after a very thorough washing, an acid bath being used, the print can be toned and refixed along with others.

Of course, this is a somewhat troublesome and roundabout way of procedure that possibly only extraordinary circumstances would justify; but the next method I shall give, which is entirely new, possesses the advantages of extreme simplicity and of giving tones at least as good as, and in some cases superior to, those obtained in the ordinary manner. It is based upon the use of a bleaching or reducing solution that is also to some extent a toning solution, which reduces the over-printed image to the desired point without removing it altogether, and at the same time partially tones it, leaving the rest of the work to be done in the ordinary bath. The treatment, in fact, consists merely in immersing the print in the reducing solution until it reaches the required depth, and then, after washing, toning it in the usual way. The results, even from apparently hopelessly over-printed proofs, are in no way distinguishable from those obtained in the regular way.

The reducing solution consists of a platinic salt; I have used the chloride chloro-platinate and also a solution in which the platinic salt had been imperfectly reduced in making the chloro-platinite. It will be remembered that Mr. Lyonel Clark some years back, in describing his platinum toning process, pointed out and explained the reason of the reducing effect of platinic salts when employed for toning purposes. Every atom of platinum deposited on the prints from solutions of those salts displaces four atoms of silver, and consequently, unless a very strong silver image exists in the first place, it suffers almost complete removal during toning. When the platinous salts are used only two atoms of silver are replaced, hence the employment of the chloro-platinite of potassium.

Thirty or more years ago, bichloride of platinum was occasionally used, but, even in those days of dense, hard negatives and strongly silvered paper, its reducing power prevented its general use, but I do not recollect that it has ever been proposed to take advantage of that power, and it was only when employing a platinum bath in which the salt had been imperfectly reduced, and therefore containing a certain or *uncertain* proportion of platinic salt, and, noticing that some over-printed proofs were the only ones that passed the ordeal with even moderate success, that the idea suggested itself of putting the reducing action to a practical use. Having done so, I can report upon its perfect, and, I may say, unqualified, success.

Briefly, the method I have adopted is as follows: I have selected the bichloride of platinum as being the most generally useful salt, and of this I add one grain to five ounces of a saturated solution of common salt to form the reducing solution. This may be kept as a stock solution, and, so far as I can see, does not undergo any change, except from the gradual exhaustion by use, as is the case with the gold toning bath. The prints to be treated are just washed along with the others to remove the free silver, and then immersed in the reducing solution until brought down to the proper stage. The same precautions require to be taken as in toning to secure uniformity of action, but the colour of the prints in the reducing bath forms no part of the calculation, and must be disregarded. With some kinds of paper, a decided toning action takes place before reduction occurs, especially when the degree of over-

* Concluded from page 612.

printing is considerable, but in others no change at all occurs unless it be a reddening.

The reduction must not be carried too far, for it must be borne in mind that the gold bath will still further bring the prints down; indeed, I think, to a greater extent than when the platinum bath has not acted, and this further action must always be allowed for; and that forms the only point in the process that requires the least care. The precise allowance varies with different makes of paper as well as with different degrees of over-printing; but these little points are soon mastered, and the whole process becomes one of the greatest simplicity and certainty. After the reducing bath, the prints require to be thoroughly washed, to removed acidity and also the excess of salt, and may then be toned along with the rest, though they will require special watching, as they tone much more quickly. The sulphocyanide and phosphate baths are those that have given the best results in my hands.

Those who are troubled with over-printed proofs will find this last method a great boon, as it requires no special preparation after the solution is made, and by its means prints that are so dark as to be barely distinguishable can be made to give as perfect results as if printed to exactly the correct depth. W. B. Bolton.

ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

As we predicted last year, the method of formally inaugurating the Exhibition by a private view in the daytime, as well as by a conversazione in the evening, was maintained on this occasion, and on Saturday last the gallery at Pall Mall was in a more or less crowded condition all day. The attendance at the private view, in spite of drizzling rain, showed no signs of falling off, while the *Soirée* attracted over a hundred more visitors than on any previous occasion, some five hundred and fifty members and friends being present in the evening.

In the unavoidable absence of the President (Captain Abney), who has called down into the country on urgent business, and of the Hon. Secretary, Mr. Chapman Jones, who is suffering with influenza, the Society's guests were received by Sir Henry Trueman Wood (Vice-President), Mr. G. Scamell (Hon. Treasurer), Mr. E. Clifton (Librarian), and by Messrs. Bolas, Bridge, Cadett, Cembrano, Debenham, Hertslet, Hollyer, Mackie, Marchant, Sinclair, Spiller, Wall, and Wilmer.

Among those present we noticed the following:—Mr. H. L. Ashton, Dr. and Mrs. Acworth, Mr. E. R. Ashton, Mr. and Mrs. W. E. Asquith, Mr. Smedley Aston, Mr. and Miss Avent, Messrs. Bernard Alfieri, H. W. Bennett, Agar Baugh, Frank Brown, L. M. Biden, F. W. Brook, Mr. and Miss Bickerton, Mr. E. E. Barrow, Mr. and Mrs. F. A. Bridge, Messrs. Bingemann, C. and A. Bayne, Braun, A. E. Brown, W. A. Bagley, W. Barry, F. O. Bynoe, Birt Acres, Graystone Bird, T. Bolas, C. Beadle, Redmond Barrett, Algernon Brookes, Mr. and Mrs. Cembrano, Messrs. A. J. Campbell, J. Carpenter, F. B. Cattley, F. N. Clark, F. T. Carter, Edgar Clifton, C. Coleman, F. A. Crew, B. Cox, Page Croft, Mrs. Cole, Dr. McDonald, Mr. Sebastian Davis, Mr. Herbert Denison, Messrs. F., Charles, and W. E. Debenham, Mr. and Miss Drage, Messrs. H. E. Davis, P. Everitt, H. J. Ellis, H. C. Everson, E. H. Fitch, A. Fisher, A. H. Fisher, E. W. Foxlee, J. T. French, A. Fellows, C. H. Freeman, T. Fall, S. H. Fry, E. Fuchs, J. Fuerst, T. E. Freshwater, Mr. and Mrs. Gerard, Messrs. J. Guardia, A. J. Golding, Geard, G. Gosling, H. D. Gower, J. Gunston, J. H. Gear, Hirst, W. E. Henry, A. P. Hoole, A. S. Handford, A. L. Henderson, Mr. and Mrs. E. Cecil Hertslet, Messrs. Holt, Howard, A. S. Newman, W. Jones, G. H. James, F. E. Ives, F. W. Jackson, A. J. Jones, H. Jeula, A. J. Johnson, L. de Jonquieres, J. J. Vezey, Klosz, P. King, Rev. F. C. Lambert, Messrs. C. B. Lewis, R. B. Lodge, H. G. Moberley, Monnickendam, W. M. Ashman, H. A. Morrison, R. Y. Murphy, H. Maclean, E. Marriage, Mr. and Mrs. J. C. S. Mummery, Messrs. L. Matthews, Paul Martin, H. T. Malby, F. W. Muncey, Mr. and Mrs. Fred Marsh, Messrs. E. R. Mattocks, S. F. Morgan, W. Martin, A. Mackie, S. C. Mote, J. Nesbit, D. J. O'Neill, S. W. Owen, J. H. Oliver, C. H. Oakden, W. L. Opie, Major and Mrs. Prendergast, Messrs. R. B. Pyke, A. F. Penraven, W. A. Palmer, F. L. Pither, Mr. and Mrs. E. E. Pither, Mr. W. H. Prestwich, Colonel and Mrs. Palmer, Messrs. H. C. Rapson, Ray, A. J. Rayment, J. L. Russell, W. Rawlings, Mr. E. J. and Miss Richards, Messrs. F. W. Renant, H. Smart, E. Swingler, E. S. Shepherd, C. Stuart, O. Sichel, H. Stuart, J. Stein, T. A. Scotton, C. H. Smith, Claude Spiller, Mr. Arnold and Miss Spiller, Mr. and Mrs. E. Scamell, Messrs. Sanford, Illingworth, Swift, Slater, H. Smith, C. F. Townsend, John Spiller, A. F. Taylor, W. Taylor, G. Taylor, H. Taylor, R. F. Thompson, F. C. L. Wratten, Mr. and Mrs. S. E. Wall, Messrs. R. C. Williams, C. E. White, Mr. and Mrs. J. B. B. Wellington, Messrs. H. Walker, J. Webster, W. T. White, Charles White, Walford, Woolnough, Watmough Webster, J. R. Williams, T. R. Wright, Allenstein, Yardley, and Zachariasen.

The Judges.

The Judges at this Exhibition were Messrs. Cembrano, Gale, B. W. Leader, A.R.A., G. Storey, A.R.A., and W. L. Wyllie, A.R.A., in the Art Section; while, in the Technical Section, Captain Abney, Mr. A. Pringle, and Mr. Chapman Jones adjudicated. The awards of these gentlemen, if not exactly those which we should have made ourselves, are at any rate free from the eccentricities which we have occasionally found it necessary to denounce in bygone years, and seem, on the whole, to give satisfaction all round.

The Hanging.

On entering the gallery, we were struck by the altered appearance of the room, which, by the side of past exhibitions, with their huge frames piled from the floor to the ceiling, looks somewhat empty. The reason for this is twofold—the fashion of framing up close, which is fairly rampant this year both at Pall Mall and at the Dudley Gallery, and the fact that the selection has been much more rigorous. We were informed that over 1100 photographs had been submitted to the Selection Committee, of which 353 are upon the walls, or less than one-third of those sent in; and the thoroughness of the selection may be realised when we say that it would be difficult to point to a dozen frames which it would improve the Exhibition to omit; in fact, with hardly a single exception, meretricious work is conspicuously absent. Moreover, this year the walls have been to some extent split up into panels by means of drapery, and the groups of pictures so made selected so as to harmonise with one another. The extent to which this has been carried is so great that practically all the photographs on light-coloured mounts are to be found in two small groups, the appearance of the remaining divisions being vastly improved by the absence of the spottiness such frames create when mixed with darker work. The apparatus has been kept to what is generally regarded as the "technical" end of the room with advantage, and the general effect is to greatly increase the apparent size of the gallery. The hanging, as far as we could gather on Saturday, met with general approval, one visitor declaring it to be the best hung exhibition he had ever seen, but this assertion is perhaps too sweeping. Any how, a change for the better has been made, which we trust will be maintained, and the selection has been carried so far as to make the admission of a picture to the Exhibition an award in itself. The emptiness of the upper portion of the walls and the removal of the apparatus table has the effect of revealing the extreme shabbiness of both carpet and wall-covering, and, since the Society is mulct in the amount of some 170*l.* for rent alone for the Exhibition, it is high time their landlords recognised the necessity for putting both on a better footing.

The Pictures.

It is as well to say at once that the Exhibition contains no work which, by reason of its striking super-excellence, stands out head and shoulders above its surroundings. On the other hand, as we have said before, it is singularly free from rubbish, and hardly a picture is on the walls which will not repay careful attention. To start with the awards,

The Medalled Pictures.

No. 38, *A Study*, by Phillip von Schoeller, is one with which almost every one will agree. A portrait of a girl in a dark cloak and cap, with a white ruff round her neck, it is one of the most pleasing pictures in the Exhibition, and possesses a softness and delicacy which is well worthy of emulation. It is printed by the Artigue carbon process. The other portrait by the same exhibitor, No. 45, *A Tyrolese Peasant*, is hardly of such good quality, and is a little crude, but is still distinctly high-class work. Mr. J. Bushby takes a medal for No. 57, *Trau Cathedral, Dalmatia*, an interior of a singularly "pencil" like texture. Another of his exhibits (No. 82), *Gipsies, Herzegovina*, is an excellent example of grouping, but suffers severely by the method of printing adopted, red carbon on opal, which robs it of much of the vigour which would be well placed therein. *Oxen Ploughing* (No. 118) is a much more satisfactory print to our mind, but Mr. Bushby's No. 252, a heron or other long-legged bird in a pool, presents possibilities rather than their realisation. The bird's head is, unfortunately, lost to some extent in the distracting background, while its reflection in the water is aggressive in the extreme. Messrs. J. Bulbeck & Co. are represented by a large number of architectural photographs of a high order of merit; for No. 121 (*Norwich, North Choir Aisle*) they have received an award.

While on the subject of architecture, it is worth while remarking that the Exhibition this year is particularly strong in this direction. Messrs. Bulbeck & Co., Bolas & Co., Bedford Lemère, & Co., and Mr. H. W. Bennett all send work of a very high order of merit while Mr. Marriage's two "capitals" from Canterbury Cathedral (Nos. 329 and 335) compare favourably with his medalled work of last year. Mr. W. Thomas has scored a success this year with his *Ebb of a Winter's Day*, and we must congratulate him on having been there in time. Another two minutes and the day would have ebbed completely, but Mr. Thomas was there, and a figure is distinctly visible on the print. To our mind the *Corner of a Kentish Common* (No. 159), by the same exhibitor, is his finest production so far, and we are glad to see that he has gone in for work of more imposing dimensions. Hitherto many of his careful and delicate pictures have escaped examination by the public on account of their diminutive size; while we should be sorry to miss the charming hand-camera results which he exhibits, we are glad to see that he has adopted a course which will bring him under more general attention. The *Kentish Common* is one of the finest pictures in the Exhibition, the silver birches attract the eye at once, and the foreground, full of detail, but quiet and unobtrusive, leads one instinctively to the middle distance, in which the interest centers. The same exhibitor shows his versatility by *My Chum* (No. 158), in which a hairy terrier is well portrayed.

One medal this year goes to America, to Mr. Alfred Stieglitz, for *A Decorative Panel*. A tow path, on which is a group of goats, and puffing steamer tugging some barges up the steam, constitute the photograph which bears this name. In the sense that every beautiful framed photograph is essentially a decorative panel, the title is a good one, but its special applicability we are unable to detect. The atmospheric effect is well rendered, and the print is unexceptionable. In *Roses* (No. 245), by Dr. G. McDonald, which also takes a medal, we have as fine a photograph of the national flower as we have ever seen. The grouping is excellent, and the texture faithful to the extreme, but the print suffers from the frame, which is not suited to it, and distracts attention rather than concentrates it. The same remarks apply to No. 267, *The Potter*, by the same exhibitor, which narrowly misses being a highly successful result. Mr. C. F. Inston receives a medal for No. 291, *Waiting for the Wind*. In this a barge is seen silhouetted against a stormy sky, which suggests that the barge will not have to wait long; No. 284 is a very similar composition, and both possess a considerable degree of force, both are fine examples of the treatment of clouds. *A Modern Gallio* (No. 285), by Mr. Inston, represents a group of men on a street seat, and, as an example of natural grouping and of the artistic use of a hand camera, is as fine an example as the Exhibition contains.

Mr. Wilson Noble receives a medal for three X-ray photographs of the hand and forearm (No. 347), the heart and ribs (No. 348), and the foot (No. 349). Of these Nos. 347 and 348 are the most distinct of their size we have seen. No. 348 is good, but, being a much more difficult subject, is necessarily not so well defined.

Lantern slides have received one award, which goes to Mr. Paul Martin for a series of views of *London by Gas Light* (No. 360). They are exceedingly impressive on the screen, but, viewed in the hand, much of their charm is lost; the two enlargements of the same subjects on the walls (Nos. 101 and 119) hardly do them justice. Of the other exhibitors, some of the finest work is that by Mr. J. A. Sinclair, whose frames bear the inscription, "Not for competition." His *Dutch Peasant* (No. 8), an old woman crossing a market place, is of a kind with which he has made us familiar; while No. 16, *Sea, Sky, and Sand*, with its brilliant cloud effect repeating itself in a lower tone in the pools and wet sand, is the best of his work yet exhibited. One word to this exhibitor himself, and that is, that his prints suffer by being so frequently of exactly the same tone of carbon. Mr. E. Cecil Hertslet's *Wayside Shrine* is too regular in composition to be pleasing. *The Silent Mere* (No. 60), by the same exhibitor, is a soft, harmonious little picture, and much more satisfactory.

Colonel Gale, we must confess, disappoints us this year. Neat and pretty as ever, there is nothing about it that marks it out as being better than much of his former work, while more than one of his prints suffer by the heaviness with which the clouds are printed down. No. 220, *Mid-day Lunch*, is the most satisfactory, a group of horses in a ploughed field, the men, who are surely dining and not lunching, being seated at the hedgeside. The distant trees are suggested, while cumulus clouds betoken early spring. With Colonel Gale may fairly be bracketed Mr. B. Gay Wilkinson. The only criticism to be made on this gentleman's exhibits is, that they too closely resemble one another to be hung together as they are. Both Nos. 219 and 221 are striking groups of fishers round the boat in which they put to sea, and the black figures against the brighter sea and sky give a boldness and strength to the composition which is highly satisfactory. Mr. W. M. Warneuke is represented by a large portrait (No. 37) and by two landscapes. The portrait, which is the most imposing exhibit upon the walls, strongly suggests Whistler, and is a difficult subject cleverly treated; it narrowly misses being one of the finest photographs of the year. We say it narrowly misses being so, because there are one or two distracting elements which, once noticed, attract attention every time. A lady in a veil is seated, looking directly towards the spectator, on her right is a picture hanging on the wall, which is unhappily out of the horizontal, while the spots on the veil, one of which adorns the tip of the nose, while two others are symmetrically placed on the mouth, are aggressive. In other respects the portrait is a fine one, its dark tone and massive frame set it off to the best advantage. No. 63, *Evening*, by the same exhibitor, is successful as a picture, but unhappily it owes all its effect to a moon which is undoubtedly (complete with reflections to match), "made in Glasgow." *Our Village* (No. 100) is reminiscent of H. P. Robinson as far as the figure is concerned, and does not appeal to us as being up to Mr. Warneuke's usual standard.

We are glad to notice Mr. Alexander Keighley as an exhibitor once more. In No. 11, *An Alpine Cross*, a bold attempt is made in a figure subject, with the Matterhorn in the background. The idea is a good one, but the figures should be more prominent, or suppressed altogether. Mr. J. A. Hodges is another exhibitor whose work this year disappoints us, both here and at the Dudley Gallery, as also does Mr. T. M. Brownigg, whose prints suffer very greatly from the unsuitability of their frames. Under other circumstances, No. 137, *An Autumn Evening on the River Wey*, would be pleasant, but, in a brown frame, with a broad gilt matt, the delicate half-tones of the picture are quite lost.

Dr. Page May figures with no less than thirteen exhibits, of which some are relegated to the technical corner. The finest of these is a large and striking picture of the desert (No. 208), in which the vast waves of sand, with the varying play of light upon them, are seen stretched out beneath a cloud-filled sky. The sky and foreground are singularly harmonious, and an impressive result is obtained from most unpromising material. Some of his other frames are worthy of mention as excellent examples of what can be done with such hackneyed subjects as the pyramids and Sphinx, while a series of flashlight photographs taken in the desert, in the actual excavations themselves, of bas reliefs, &c., are of a high quality as regards technique, and of an interesting nature as far as their subjects are concerned, Queen Hatasu, the founder of the Egyptian navy, and her father Aahmes being sufficiently well depicted to show a marked family likeness.

Mr. G. Watmough Webster is represented this year by one portrait, *Mr. Gladstone in his Study* (No. 249), an excellent subject, well handled. The People's William is bending, in a characteristic attitude, over his table, littered with papers, and, doubtless, with postcards also, and, although little of his face is to be seen, the stooping figure and massive head are unmistakable at a glance. The Autotype Company send an enlargement from the well-known picture of Li Hung Chang and Mr. Gladstone, by Mr. Webster, which is hung in a conspicuous position, and will, no doubt, attract as much attention by reason of its subject as its execution, although both are worthy of praise. Mr. Tom Bright sends two pictures, *The Ever-busy River* (No. 19), and *In the Pool* (No. 21), of which the former is remarkably bright and sunny. Mr. Arthur E. Clementson's portraits (Nos. 33 and 39) are examples of good straightforward work, and are reminiscent of Valentine Blanchard at his best. No. 50, *Good Night*, by Walter Mawer, is a good subject badly treated, the lighting being as false as it could be; the candle is obviously impossible. This is strongly suggested in the little sketch in the catalogue, in which the artist has taken the liberty of showing how it should be done. A fine example of what can be done in the direction of the sacrifice of definition without offence is to be found in No. 43, *From Southern Climes*, by R. W. Craigie—the best work we have seen by this gentleman up to the present. The poses in the portraits by O. W. Huntington (No. 49) and R. H. Head (No. 51) are natural and unrestrained. Portraiture this year figures very strongly at Pall Mall, and is one of the features of the show. John Stuart sends portraits of *George Mason* (No. 200) and *E. J. Wall* (No. 215), the first-named being an excellent likeness of a well-known figure in the photographic world. Mr. Wall "wears a worried look"—the cares of journalism appear to sit heavily upon him; but, when we saw him on the occasion of the press view, he seemed better. The other examples by John Stuart (Nos. 31 and 47) are good, without calling for special remark.

Two groups of a vegetarian nature remind us that Mrs. Cadby is still to the fore, as indicating what may be done in the way of design by means of photography, but they bear no evidence of improvement on what has gone before by the same worker. Mr. W. A. Cadby sends us

the naked child in a fresh position (No. 210), (we are getting rather tired of that child, Mr. C.); he also exhibits No. 143, a distinct departure, in which a group of children are seen going down a slide. The picture is worth examination, the sense of motion and of instability is admirably conveyed by each figure, and the whole is most wintry in its suggestiveness. Mr. Pringle is at his best in a portrait of the late W. England (No. 146), another example of Artigue paper by the way. Mr. Mummery's two pictures (Nos. 150 and 166) are too similar to each other, and to some that he has exhibited before, to call for much comment, but as examples of carbon prints, on a paper the texture of which strongly suggests the painter's canvas, they are deserving of attention. Mr. Edgar G. Lee is disappointing, after his medalled picture last year; as also is Mr. Golding to some extent, who is represented by a single exhibit (No. 206). This is full of light and air, the clouds are suggestive of a slight breeze, and the river is well rendered, with its smoke and shipping in the distance, but all the same we have seen better work from his camera a year or two since; but the biliousness of his last year's work has fortunately passed off, so we have no complaint to make on that score. *La Haine* (No. 231), by Clarence B. Moore, conveys its meaning at a glance, but the expression after longer study is a little forced. It is, nevertheless, a powerful work, and he well shares with Stieglitz the burden of maintaining the reputation of American workers. Mr. G. Scamell sends a couple of pleasant landscapes at Chidingstone, and Messrs. Seymour Conway (No. 181) and Harry Tolley (No. 178) maintain their old won reputation with characteristic work.

Mr. J. H. Gear's exhibit is a remarkably fine one, and we are surprised that it has been passed over on this occasion by the Judges. *Silvery Morn* (No. 112) is the best we have seen of his, its only fault is a suspicion of uneven shading during printing in the distant trees. No. 205, *The Lowland Homestead*, by this exhibitor, is a charming evening landscape redolent of B. Gay Wilkinson. Mr. F. Hollyer sends a portrait of W. Watson in his usual style. We recognise in the book and the door, not to mention the table, Mr. Hollyer's simple and frequently used accessories. A fine work as regards technique is No. 274, a copy in platinum of *Prosperine*, by D. G. Rossetti, by the same exhibitor. Delicate and graceful, too, is *Winding the Skein* (No. 290), by Miss G. Stoddart. No. 293, by C. B. Keene—*Lath Kil Dale, Derbyshire*—is hardly up to last year's standard, and is a little spotty, but pleasant, nevertheless.

A most remarkable exhibit is that of Mr. Frank Haes, who sends three animal pictures—*Ruppell's Vulture* (No. 310), *An Ostrich* (No. 304), and *A Porcupine* (No. 303). These are each taken from half a stereoscopic wet-plate negative made in 1865, and will bear comparison with the finest modern work of the kind, in spite of the enhanced powers given to photographers by the dry plate. A careful study of this exhibit is most instructive. Henry Noth's plant pictures are good examples of a branch of applied photography of which more use might be made than is the case, and Fred Marsh's flashlight interiors are remarkable. No. 337 represents an underground kitchen in a "doss house," and was taken at 11.45 p.m. It seems to give a good idea of such a domicile, but we are unable to vouch as to its fidelity from actual experience. Mrs. C. W. Ward exhibits a good reproduction of the Davenant bust of Shakespeare (No. 341); while Mr. Lodge sends pictures of birds and nests, which could only have been obtained under great difficulties.

Captain Tottenham exhibits a couple of photographs taken during the Chitral campaign, and Mr. T. A. G. Strickland four views of a beetle from the Transvaal, known by the cheerful title of *Brachycerus apterus*. (No. 316).

The lantern slides call for little remark, and the stereoscope contains but two exhibits, by Mr. Fortescue Mann, and Mr. F. Dunsterville, respectively.

Apparatus is limited to the Incanto acetylene gas generator, and the Incanto lantern fitting by Thorn & Hoddle, the Memorandum and 5 × 4 Frena cameras by R. & J. Beck, Limited., the Scientific hand camera, Sanderson's camera and some printing frames by Houghton & Son, the brilliant view-finder and "Censabul" focussing chamber by Adams & Co., the Stigmatic lens, J. H. Dallmeyer, Limited, a large process camera and an instantaneous lens flange by W. Watson & Sons, the Xit and other cameras by J. F. Shew & Co., a lantern carrier and an arrangement for making photographic doubles. Most of these we have at one time or another described in our columns, and we cannot now do more than mention them.

In addition to those exhibits to which we have referred, there are on the walls at Pall Mall many others well worth the visitor's attention. As we said before, the Exhibition, as a whole, is of a very high quality, certainly the best both as regards quality and arrangement that the Society has ever held. We are glad to note that the Royal Photographic Society has not accepted the impertinent suggestions made to it from time to time to relinquish the care of the art side of photography to the self-appointed critics of the Linked Ring; and that, on the contrary, in spite of a spirited opposition, its forty-first Exhibition is its best within recollection. While the work is good in quality, much care has been given to its adequate display, even to such a comparatively trifling detail as the toning down of the number labels to a tint harmonising with the particular frame each is upon. The Exhibition improves on acquaintance, and we left it after our last visit with a higher opinion of its merits than at the commencement. No photographer who can by any means manage to visit it should omit to do so. To the charms of the pictures themselves are added demonstrations of X-ray photography every day at 3.30 p.m., and of the Birt Acres Kinematoscope every Monday, Wednesday, and Saturday evening at 8.45.

THE PHOTOGRAPHIC SALON.

(Second Notice.)

A second visit to the Exhibition at the Dudley Gallery gives us the opportunity of supplementing our last week's notes. We then made allusion to some examples of the bichromated gum process, which did not appeal to us as very satisfactory examples of photographic printing. Dr. Henneberg selects this method of printing for several of his exhibits, notably *Stormy Weather* (No. 9), in which the effect of wind is well conveyed in the swaying trees. There are two tones in the picture, black and blue-black, and the process suits the particular subject. But, with other examples, Dr. Henneberg, as well as Messrs. Watzek and Kuhn, who also send bichromated gum pictures, gets patchy effects, which we do not think likely to achieve any other success than that of curiosity. The head of the *Tyrolese Hunter* (No. 12), by A. Kuhn, in red pigment, is extremely good, being free and unconstrained in posing. M. Colard's idea of *A Fine Day in London* (No. 14) is not ours. It conveys to us the impression of fog and mist. But then we live in London and M. Colard does not, so that there is plenty of room for difference of opinion on the subject. Major J. Fortune Nott's excellent representation of a *Caravan in the Desert* (No. 24) would, in our opinion, have been improved by the elimination of some of the foreground. *Better be Merry than Wise* (No. 27) is the happily chosen title for a study of two laughing young women. It is so well done that we shall expect to see further work from Mr. McNay, who is a new exhibitor to us.

Some of the foreign exhibitors impress us by their powerful work, others puzzle us. Commonplaceness is what we think characterises the group of *Fishing Boats* (No. 29), by Paul Bourgeois, for it is pretty without being pictorial. Again, *Old Women* (No. 33), by Ach. Darnis, is just an ordinary group of three old dames that should have no place here, where everything is supposed to be so very pictorial. *A Portrait* (No. 36) of a lady, by Mr. W. Howard Hazell, is a small but pleasing and able representation of a lady about, we should think, to depart for the opera, the theatre, or a dinner party. *A Child's Head* (No. 37), by Mr. Eugene Lee Ferguson, is capital, but unnecessarily soft, even to mistiness, and giving us the idea that the effect aimed at has been over-accentuated. Other exhibitors besides Mr. Ferguson impress us in a similar manner. A lurid and bloodthirsty person is portrayed by Mr. F. W. Gauntlett in *The Anarchist* (No. 46). It is a clever contrast of light and shadow, and a highly effective portrait study, but Mr. Gauntlett should not use his cleverness for the purpose of tickling the groundlings. Anarchists are not necessarily fierce and wicked-looking. We have seen a great many that are bland and respectable-looking persons, who might, as far as appearances go, be prosperous pork butchers and members of vestries.

We note several portraits by Mr. Hay Cameron which call for no comment but that which we have so many times before bestowed on Mr. Cameron's work; they are mostly uniformly good and natural. Good, too, is the portrait of *Mrs. Bruce* (No. 54), by Mr. J. C. L. Knight Bruce. We seem to be looking at the portrait of a lady in her habit as she lives—a happy and spontaneous production, not the elaborated and excessively careful outcome of a studio *séance*. Mr. Knight Bruce has, as it is customary to say, scored. Mr. Thomas Manly's *Gloriana* (No. 55) is a frightened-looking young person with towzled hair, surrounded by a halo, and the photograph has a bilious-yellow tone. If allegory be the underlying idea of this production, we must own that, in this case, we fail to follow Mr. Manly. What fine scope it offers to the caricaturist, as does Mr. Cameron's *My Uncle John* (No. 63), the original of which would appear to be very startled at the operation of having his photograph taken. The high lights in Mr. James Brown's otherwise effective view, *A Windy Morning* (No. 61), has been apparently produced by a

lavish display of Chinese white. We cordially congratulate Mr. Ralph Robinson on his *Solomon J. Solomon* (No. 70). The popular painter is standing before his easel, and a perfect bit of artist-at-home portraiture is the result. It is really so photographically good that we are surprised the Committee of the Salon did not reject it.

This Exhibition will long remain a surprise to us by reason of the difficulty we experienced in realising or discovering the effects alleged to be present in some of the results shown. Thus, that able worker, Mr. Leslie Selby, is one of the first to baffle us. He calls a charming little view *Evening by the Sea* (No. 64), but, however intently we regard the photograph, we do not realise that it depicts the approach of night. Mr. L. C. Richards is to us equally ambiguous. His *Jolly old Friar* (No. 75), which we have seen before, looks to us like the head of a smiling old *woman* in monk's garb. It is not *mannish* enough. The rubicundity, the rotundity, and general coarseness of the jolly old friar of conventionality are, in our eyes, absent. The pretty and well-favoured young lady, too, in Mr. Burchett's *Poverty* (No. 82) does not bear out the title; and Mr. F. Coop, in *Above the Morning Mists* (No. 83), which is a photograph of a quaint little village, has utilised his abilities to produce a pretty but pointless effect. What is "above" the morning mists? The view? If so, therefore what, Mr. Coop?

Rev. F. C. Lambert is represented by three frames, in one of which is a delightful study of a dear old lady, *Granny* (No. 95). The arrested attitude of the old dame and the shrewd and kindly expression of her aged face have been cleverly taken advantage of to produce an excellent result. *Ruth* (No. 91) is the title of a pleasing study of a young girl, by Mr. Sutcliffe. The effect is that of ease and gracefulness. Mr. Alfred Werner strikes the key of drama in *Evicted* (No. 93), depicting a woman on the country side looking back towards the humble home she is leaving. In *Autumn Morning* (No. 97), Mr. Paul Naudot contrives to impart to his view, with its leafless trees and advancing figures, quite a chilly atmosphere. It is, besides, a crisp, clear, vigorous photograph, decisive in style, and therefore all the more welcome amidst much that is produced to prove how very unlike anything resembling a photograph it is possible to make a photograph.

There is so little humour on the walls of the Dudley Gallery that Mr. J. W. Eadie's *Playmates* (No. 120), two kittens at play, a clever and pretty little photograph, comes as a welcome relief. We have already made reference to Mr. Lionel C. Bennett's absorbing view of a telegraph pole, its proper title being, we observe from the catalogue, *On the Banks* (No. 122). His other works are less eccentric than this, for which he, nevertheless, asks the extraordinary price of 3*l.* (guineas would have *looked* better, Mr. Bennett); but, in our humble opinion, they do not show Mr. Bennett at his best. *An Essex Quay* (No. 123) is perhaps the ablest of the four, although it is difficult for us to decide whether the vessels at the quay side are lying on mud or in water. Last week we overlooked one or two of Mr. E. R. Ashton's Egyptian landscapes, otherwise we should not have charged him with the sin of monotony. His *Egyptian Pastoral* (No. 132) and *Evening near the Pyramids* (No. 133) are both beautiful views, which stamp him as being very versatile in camera work. Mr. R. W. Robinson also sends some very fine landscapes and seascapes, which some few years ago would have been hailed as revelations, now they are accepted as a matter of course. Mr. Robinson, however, well holds his own in portraiture, his *Sir John Everett Millais* (No. 171) meeting with general applause, to which its simplicity and dignity entitle it. In *October Morning* (No. 160) M. Desiré De Clercq has a novel and, we think, hardly natural effect; the light streams down like so many sheets of vapour. The effect is certainly overdone. There is a little hardness in Mr. Burchett's charming study of a flower-decked lady, *Ceres* (No. 198), otherwise it is entirely successful. *Rosebud* (No. 143) is the title given by Mr. H. Irving to an exquisitely modelled, half-draped bit of "statuary;" and some admirable figure studies come from Mr. A. B. Langfield. Mr. E. Atkinson makes the most of an old subject, *The Weed Burner* (No. 162); and, of the many contributions of Mr. Karl Greger, *Gower Shore* (No. 164), with its wonderfully realistic effect of seashore sands, is probably his best. *Cornfields* (No. 176), by Mr. C. Moss, is surely wrong in tone and too heavy and dark for such a subject. *The Potter* (No. 182), by De Clercq, an interior study of a potter at work, is somewhat halated, otherwise it is good *sui generis*. Some admirable portraits by Mr. Van der Weyde—his *Lord Leighton* (No. 215) deserves particular notice; Harold Baker, Hollyer—his *W. E. Henley* (No. 241) is decidedly his best—W. Crooke, and Alfred Geruzet, will, doubtless, attract the visitor's attention. Indeed, in this respect the Salon exhibitions are always particularly worthy of patronage. They are helping slowly but surely to kill the "commercial" portrait of former years—the over-retouched, artificially posed, simpering, wooden, characterless, and manufactured article that has too long passed current as photographic "portraiture."

One of the best things shown is Mr. N. S. Kay's *A Critic* (293). The critic is Trilby, and she is seated, intently scrutinising a picture that she is holding. Alike in skilful arrangement and naturalness of rendering, this photograph appeals to the eye as a sound and satisfying piece of work.

We have mentioned, we think, the salient features of this fine Exhibition, and bare reference to the names of D. W. Wynfield, A. J. Golding, C. J. Berg, J. Bushby, Hall Edwards, Stieglitz, Bremard, G. H. James, J. Bulbeck, W. A. Cadby, H. E. Davis, Frances B. Johnston, Janet Reid, A. Barbichon, Mrs. Hodgson, and F. H. Evans must suffice as a general indication of the other exhibitors whose works most took our fancy. But as we said last week, we consider the work of La Begue, Paul Bergon, C. Puyo, Horsley Hinton, and Craig Annan to be the best shown. It is photographically as well as pictorially good, and therefore appropriates a double claim to our regard.

The Exhibition remains open till November 7, and well deserves to be visited.

PHOTOGRAPHIC CHEMICALS AND THEIR ADULTERATIONS.

II.—Sodium Salts.

Acetate of Soda. — The commercial acetate may contain sulphate of soda, sodium chloride, lime, and traces of calcium sulphate. Seeing that the salt is extremely deliquescent, the percentage of absorbed moisture should, first of all, be determined by drying a weighed portion of the sample in a water bath, and noting the loss of weight. The dried salt is then to be dissolved in as small a volume of water as possible. Should any white residue—consisting of calcium sulphate and a little lime—remain behind, it may be separated by filtration, dried, and weighed. The concentrated solution should then be largely diluted with water, and divided into three equal portions. In the first portion the sulphuric acid is to be determined by precipitation with barium chloride in the usual way. The percentage of anhydrous sulphate of soda is then calculated from the weight of the barium sulphate obtained, 233 grains of the latter being equivalent to 142·4 of the former. In the second portion of the solution chlorine is estimated volumetrically by means of a standard solution of nitrate of silver, similar to that employed in the analysis of potassium bromide. The operation is to be carried out in the manner already described, chromate of potash being employed as an indicator. A hundred measures of the standard solution are equivalent to ·292 grain of sodium chloride. In the third portion of the aqueous solution the dissolved lime must be precipitated, by the addition of ammonia and ammonium oxalate. The precipitate of oxalate is boiled, filtered off, well washed with hot water, dried, and finally strongly incinerated in a porcelain crucible, whereby it is converted into carbonate of lime. Ten grains of the carbonate are equivalent to 5·6 grains of lime. The weight should be added to that of the insoluble lime and calcium sulphate.

Biborate of Soda.—The commercial salt, better known by the name of borax, frequently contains, as impurities, sodium chloride, sulphate of soda or ammonia, and traces of aluminium sulphate, the last-mentioned salt being usually present in the form of an alum. To detect sodium chloride, dissolve a portion of the sample in water, and add in excess a weak solution of nitrate of silver. The precipitate will consist of a mixture of borate, sulphate, and chloride of silver. On treating it with dilute sulphuric acid, added in excess, the borate and sulphate of silver will be completely dissolved, but the chloride, being insoluble in that acid, will remain behind. Should the precipitate dissolve entirely, it is a proof that the sample is free from chloride. The sulphates may be detected by treating the borax aqueous solution with barium chloride. Again, a mixed precipitate will result, this time of the borate and sulphate of barium. Treated with dilute nitric acid, the former will dissolve, leaving the latter as a residue. In this case, after boiling the liquid, the precipitate may be collected on a filter, washed with hot water, dried, ignited in a porcelain crucible, and weighed. The percentage of sulphate or sulphates in the sample may then be calculated. Every 23·3 grains of the precipitate are equivalent to 8 grains of sulphuric anhydride, or to 14·2 grains of anhydrous sodium sulphate. If any alum be present unprecipitated in the solution of the sample, it may be precipitated, in the form of alumina, by the addition of a strong solution of ammonia. The precipitate should be collected on a filter, washed, dried, ignited, and weighed. Every 10·28 grains of the dried precipitate are equivalent to 90·68 grains of crystallised ammonium alum. When alum is present in quantity, a white precipitate is invariably formed when the sample is dissolved in water. This is the borate of alumina, a salt of uncertain composition. It usually contains about 38 per cent. of alumina.

Bicarbonate of Soda.—This salt is seldom so seriously contaminated as to be unfit for use in photographic processes. Samples sometimes contain some neutral carbonate, moisture, and traces of sodium chloride and sulphate. For the detection and estimation of these the reader may

refer to my remarks on the bicarbonate of potash. The solution of oxalic acid, there described, will be found useful for estimating the percentage of pure bicarbonate present in the sample. The volumetric operations with this solution are to be carried out in precisely the same way as in the case of the potassium salt; only, in making the calculation, it must be borne in mind that 1000 grain measures are the equivalent of 8·4 grains of pure bicarbonate of soda.

Carbonate of Soda.—The ordinary carbonate, or "washing soda," is one of the crudest salts in the market. Moreover, as regards its water of constitution, it is a salt of a very variable composition. For photographic purposes the anhydrous carbonate, when it can be procured, is much to be preferred; and, as it may at all times be easily produced by heating the pure bicarbonate to redness, it is surprising that the crude hydrated salt should be so largely employed for developing and other purposes. The complete analysis of the commercial salt is too lengthy and complicated a process to be described in detail. The chief impurities likely to be met with are the following:—Free alkali, sodium chloride, sulphate of soda, sodium sulphide, sulphite of soda, and thiosulphate of soda. The salt last mentioned is, I need hardly say, an impurity of the harmful class, and one of whose absence the photographer must be careful to assure himself when selecting a sample for use. It may be detected by treating the aqueous solution of the carbonate with excess of moderately dilute hydrochloric acid, and boiling in a flask over an Argand burner. If thiosulphate be present, the solution will become turbid from the deposition of sulphur, and sulphurous oxide gas will be given off, and may be recognised by its odour of burning sulphur.

If, however, the odour is that of sulphuretted hydrogen, the presence of sodium sulphide is to be inferred, and may be confirmed by the blackening of an acetate of lead test paper held in the stream of the evolved gas. Lastly, if sulphurous oxide be given off without deposition of sulphur in the liquid, sulphite of soda is present. As a confirmatory test for the latter a scrap of zinc may be added, and, on again heating, sulphuretted hydrogen will be evolved.

Sodium Chloride.—Common salt is often contaminated with magnesium chloride. The presence thereof may be inferred should the sample show signs of deliquescence on prolonged exposure to air. The percentage of the adulteration may be estimated by treating the aqueous solution of the salt with ammonium chloride, ammonia in excess, and solution of phosphate of soda. After stirring the liquid and allowing it to stand for several hours, the precipitate must be collected on a filter, washed with dilute ammonia, dried, ignited, and weighed. The ignited product is pyro phosphate of magnesia, each ten grains of which are equivalent to 8·56 grains of magnesium chloride. Should the sample contain (as it probably will) some silicous or ferruginous matter insoluble in water, this must be separated by filtration, and dried and weighed before precipitating the phosphate. Moisture may be determined in the usual way by heating a weighed portion of the sample in an oven or water bath.

Phosphate of Soda.—The crude phosphate contains sulphate of soda, and occasionally traces of carbonate of soda and phosphate of lime. The sulphate of soda may be estimated by precipitating with barium chloride, and boiling with dilute hydrochloric acid, in order to dissolve the precipitated barium carbonate and any phosphate of lime that may be present, after which the residual sulphate of barium must be filtered off. Phosphate of lime may be detected by its insolubility in water, and carbonate of soda by the effervescence which ensues when the powdered sample is treated with hydrochloric acid.

Sulphite of Soda.—The neutral sulphite of commerce is sometimes contaminated with carbonate and sulphate of soda. The latter is from the photographer's point of view a somewhat objectionable impurity. It may be detected and its amount estimated in exactly the same manner as when present in a sample of phosphate of soda. Another very objectionable impurity of which traces may be found is thiosulphate of soda. This salt is often formed when imperfectly washed sulphurous oxide has been employed in the manufacture of the neutral sulphite. It may be detected by the deposit of sulphur produced on heating the aqueous solution of the sample with dilute hydrochloric acid, and also by the gradual change in colour from white to brownish-black of the precipitate which is produced when nitrate of silver is added.

Thiosulphate of Soda.—The impurities of the commercial salt vary according to the mode of manufacture. It may contain free alkali (soda), sodium sulphide, carbonate, sulphite, and sulphate of soda, besides minute traces of chlorides and earthy oxides. Of these the sulphide of sodium perhaps deserves a place in the class of objectionable or active impurities. Samples containing free alkali should be regarded with suspicion, for in these this impurity is most likely to be found.

The following scheme of analysis may be adopted:—

1. Dissolve fifty grains of the sample in water, and precipitate the thiosulphate and other soluble salts by means of a strong solution of nitrate of lead. Filter off the precipitate, wash with warm water, and add the washings to the filtrate along with enough potassium sulphate solution to precipitate any free lead nitrate. Filter and wash any precipitate formed, add the washings to the filtrate as before, and then titrate the latter with the standard oxalic-acid solution, using litmus as an indicator. One hundred measures of the solution are equivalent to ·31 grain of anhydrous soda. Calculate the amount of alkali present from the number of measures consumed, and multiply the result by 2. The product is the percentage of free alkali in the sample.

2. Dissolve 100 grains of the sample in water, and divide the solution into three equal portions. To each of these add strontium nitrate solution in excess, stir, and allow the precipitates to stand for five or six hours. Call these precipitates A, B, and C.

When the precipitation is complete, collect precipitate A on a dried and weighed filter, and after washing dry it in a water bath. Weigh the dried precipitate and filter, and deduct the weight of the latter. To the filtrate and washings from A add solution of chloride of zinc in slight excess. Stir, and allow the precipitate of hydrated zinc sulphide to subside. If no precipitate is formed, the sample is free from sodium sulphide. Collect any precipitate on a weighed filter, wash, and dry at such a heat as will suffice to expel the molecule of water in combination with the sulphide. Weigh precipitate and filter, and, after deducting the weight of the latter, multiply the remainder by 780, and divide the product by 972. The quotient multiplied by 3 will give the percentage of anhydrous sodium sulphide in the sample.

3. To the vessel containing precipitate B add dilute acetic acid in slight excess, and, to that containing precipitate C, dilute hydrochloric acid.

If, on stirring, both precipitates dissolve, precipitate A consists wholly of strontium carbonate, and therefore the sample contains carbonate of soda, but no sulphate or sulphite. Should precipitate C alone entirely dissolve, the sample may contain carbonate and sulphite, or only the latter. Collect the precipitates on weighed filters, wash, dry in a water bath, weigh, and deduct the weight of the filter in each case. If the weight of A is exactly equal to the weight of B, and that of B in its turn to the weight of C, the precipitate in each case consists wholly of strontium sulphate. If only A and B are equal in weight, each consists of a mixture of strontium sulphate and sulphite, and C of sulphate alone. If A exceeds B, deduct the weight of the latter; the remainder is the weight of the carbonate of strontia in the mixed precipitate.

Deduct C from B. The remainder is the weight of the sulphite in the mixed precipitate, and C itself is the weight of the sulphate. When B and C are equal in weight, no sulphite is present in the sample.

When the weights of A and B are the same, and there is no precipitate C (it having dissolved entirely in hydrochloric acid), each consists wholly of sulphite of strontia.

When, under the same conditions, A exceeds B, deduct the weight of the latter, and the remainder will be the weight of the carbonate, and the weight of B itself that of the sulphite.

4. Multiply the weight of the carbonate precipitate by 1060, and, after dividing the product by 1475, multiply the quotient by 3. The product is the percentage of anhydrous carbonate of soda in the sample.

Multiply the weight of the sulphite precipitate by 1260, and, after dividing the product by 1675, multiply the quotient by 3. The product is the percentage of anhydrous sulphite of soda in the sample.

Multiply the weight of the sulphate precipitate by 1420, and, after dividing the product by 1835, multiply the quotient by 3. The product is the percentage of anhydrous sulphate of soda in the sample.

III.—Ammonium Salts.

Ammonium Chloride.—The commercial chloride nearly always contains ferric chloride and traces of sulphate of ammonia. The former is an impurity of the harmful class. Its presence in a sample may be detected by treating the aqueous solution with ammonium sulphide, when the iron will be precipitated as sulphide of iron. One hundred and seventy-six grains of the dried sulphide are equal to 325 grains of anhydrous ferric chloride. The sample may be purified for photographic purposes by treating its concentrated solution with ammonium sulphide, filtering off the precipitated iron salt, and adding dilute hydrochloric acid to the filtrate. The solution is then heated to expel the hydrogen sulphide, the excess of acid is neutralised with ammonia, and the salt is recrystallised by evaporation. To detect sulphate of ammonia, test the sample with barium chloride solution in the usual way.

Ammonium Bromide. — This salt is one of the few which are to be purchased in a fairly pure state. Occasionally, however, traces of carbonate of ammonia may be detected in low-priced samples. For analytical purposes the percentage of bromide should be estimated volumetrically in the manner prescribed for the bromide of potassium. A hundred grain measures of the standard solution of nitrate of silver are equivalent to ·49 grain of ammonium bromide. Not less than fifty grains of the dried sample should be taken for analysis.

Carbonate of Ammonia.—The commercial salt is an impure sesquicarbonate prepared by dry distillation. It generally contains several of the salts of the ammonia series, among the most common of which may be mentioned the bicarbonate, carbamate, chloride, and sulphate. It may also contain a little oxide of iron. The bicarbonate is insoluble in alcohol. The sesquicarbonate is decomposed by the same solvent, yielding two molecules of insoluble bicarbonate, and one molecule of soluble normal carbonate. The carbonate is converted into normal carbonate when dissolved in water.

These peculiar reactions interfere with the analytical processes for the determination of these impurities, and therefore the true composition of the sample can seldom be exactly ascertained, except by a very skilled chemist. Ammonium chloride may be detected by acidifying the aqueous solution with nitric acid, and adding nitrate of silver, when, if any chloride be present, it will be precipitated. In another portion of the

strongly acidified solution the addition of barium chloride will produce a precipitate if sulphate of ammonia be present. Oxide of iron may be detected by treating the solution with ammonium sulphide, whereby any iron salts will be thrown down in the form of a black powder.

Ammonio-aluminium Sulphate.—The common ammonium alum nearly always contains chlorides. Of these the two chlorides of iron must be ranked as objectionable impurities, and ammonium chloride as a contamination of the harmless class.

To detect the former, add to the boiling aqueous solution of the sample enough solution of caustic potash to dissolve the white precipitate of hydrate which is at first formed. A reddish-brown residue will indicate the presence of iron. If, however, the sample should contain a considerable percentage of ammonium chloride, a double salt will be formed, and the iron will not be precipitated. Therefore, as a confirmatory test, the aqueous solution should be boiled with a little dilute nitric acid, and tested with ferrocyanide of potassium, when, if iron salts be present, a blue precipitate will be formed. The presence of ammonium chloride in the sample may be disregarded, as it does not disqualify it for use in those photographic processes in which the alum is likely to be required.

Ammonium Sulphocyanide. — The composition of the commercial sulphocyanide varies according to the manner in which the salt has been prepared. It sometimes contains a little free sulphur and a small percentage of carbonate of ammonia. The sample may be purified from the former by filtering the aqueous solution and evaporating the filtrate to dryness. To detect the latter, add to a small portion of the filtrate calcium-chloride solution, when any carbonate present will be at once precipitated as carbonate of lime. MATTHEW WILSON.

LOWTHIME'S DEVICE FOR FACILITATING THE INSERTION OF PHOTOGRAPHS IN ALBUMS.

MR. LOWTHIME'S invention relates to an instrument for facilitating the insertion of photographs and the like—particularly those unmounted—in albums, the object being to overcome the difficulty of getting the bottom edge of the photograph or the like to enter the groove at the bottom of the opening.

The patentee says: "According to this invention I take a plate of metal, celluloid, cardboard, or other suitable material, of a width approximate to the width of the photograph to be inserted, and of such a length that, when it is inserted in the recess in the leaf of the album, it stands clear of the top thereof so that it can be conveniently withdrawn. In this plate is cut, firstly, a vertical slot preferably at or about the centre of the plate, and, secondly, two or more small holes adapted to show one or more of the edges of the opening in the leaf when the plate is in position in the recess therein.

"In use this plate is first passed into the recess in the leaf of the album and the photograph is then passed in behind the said plate, which acts as a guide for it past the bottom edge of the opening, and allows it to be easily drawn into position by the finger through the vertical slot in the plate, the other holes therein allowing the manipulator to see that the edges of the photograph are covered by the edges of the opening before withdrawing the plate.

"As a modification the plate may be made with two or more strips on the back, so that the photograph can first be inserted on the back of the plate, and then inserted into the recess in the leaf of the album through the medium of the plate."

"FOREWORDS" TO THE SALON CATALOGUE.

As usual, we take occasion to reprint the "forewords," or introduction, to the catalogue of the Photographic Salon Exhibition. They are based on wholly erroneous assumptions that, prior to the establishment of the Salon, "pictorial work in photography" was unrecognised by then existing Societies, and that now the Salon is the only "place of its own" that pictorial photography possesses. All but a handful of members of the Linked Ring will be highly amused by the blitheness of these "Forewords."

"There has been much talk in recent years concerning the position among the arts which pictorial photography is entitled to occupy.

"The establishment of the Photographic Salon, showing the truer method of using photography as a means of graphic expression, was the signal for persistent attacks upon its supposed pretensions.

"These pretensions were in the minds of those only who built them up. Their method consisted in assailing positions which had never been occupied by the men whose aims they sought to vilify.

"The object of the Photographic Salon is to give to pictorial work in photography a place of its own, and to set a standard of value by which it should be estimated, without reference, of necessity, to the conventions and principles established by other graphic methods.

"The Salon claims for this work a position of independence, and is no longer satisfied that pictorial photography should be called the handmaid of the arts; still less that it should be a hanger-on to the skirts of abstruse science in optics, chemistry, and mathematics.

"The examples here exhibited are submitted to the intelligence of the public, with full confidence in its recognition that the pictorial application of photography need not, as it did for so long a time in its previous career, degrade truth to the level of fact, or be incapable of the power of suggestion and of the intellectual expression of nature, instead of the bare registration of the obviously existent."

The Inquirer.

*** *In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

ARON'S ELECTRIC LAMP (To S. J. M.).—The Editor of *Apollo* writes: Aron's Electric Lamp may be purchased from the manufacturers, D. R. Muencke, Lusenstrasse 28, Berlin, N.W.

RETOUCHING SURFACE.—JAPHET writes: "I have tried 'Country Professional's' method, as given in last week, but can't get quite enough lead on to the film. Is he sure he has not given a formula for polishing the surface?"

DEFECTIVE PNEUMATIC HOLDER.—GELATINE writes: "Seeing a query about a pneumatic holder in this week's JOURNAL, may I ask advice about mine. It is nearly new and apparently perfect, but it will not hold a plate for more than a few seconds at a time. I have tried all means, wetting the disc, &c., and can find no leak in the bulb, or anywhere. Can you tell me where the fault is?"—See reply to "Collodion" in this column. The leak is no doubt in the metal tube, by which the ball is connected with the frame.

PERISHED INDIARUBBER.—B. W. says, in reply to "Collodion:" "I have a pneumatic holder that has been in my possession at least twenty years, and which was in exactly the same condition as the one described. I disconnected the ball and its tube from the wooden handle, and placed them in warm water—not hot—and in a few hours the ball regained its elasticity. A new disc was obtained from a dealer—cost, about 1*s.*—and when the thing was put together again it was, and is, equal to new. I was slightly troubled at first by its "losing wind" in use, but, on unscrewing the screw and touching the point with indiarubber paste before putting it together again, the leakage was entirely stopped, and it will now remain attached to a plate for hours.

SPOTTING PRINTS AND NEGATIVES.—SPOTTER writes: "In reply to 'Beaten,' spotting requires both skill and proper materials. In the first place, it is no use trying to work with inferior brushes. The finest and best sables only will answer, such as are capable of taking a perfect point. Then, the colour must be mixed with some suitable adhesive, and for this purpose sticking the brush in the mouth is about the best way of courting failure. With good water colour pure water suffices, but I always prefer to use a little thin starch, or to rub the colour up with starch paste. This will make it adhere nicely. For prints only ordinary skill is required, but spotting out pinholes in negatives is more difficult. I find liquid colour, applied with a crow-quill pen, as convenient as anything."

PURE WATER (To W. Finlay).—The following helped me out of a similar difficulty to yours, and may probably prove as useful to you. I procured, first of all, a large earthenware jar, used, I think, for pickling purposes, something the shape of the oil jars used in "Ali Baba" pantomimes, and holding about five or six gallons. This cost about two shillings, and is fitted with a lid, having a hole in the centre for lifting off. Then I got a large flower-pot, about a foot in diameter at top; this fits comfortably into the larger jar, the lid of which, in turn, fits into the flower-pot, about half way down. Into the hole in the flower-pot a small piece of sponge is plugged; then a layer of well-washed silver sand is placed; over this, a layer of granulated, not powdered, charcoal; and over this, again, more sand until the level of the lid is reached. The latter serves to prevent the sand washing up when water is poured in. The charcoal costs about sixpence per pound, and one pound serves as a charge for the above size, and lasts for a long time—some months. When filtration becomes slow, scoop out the upper surface sand without disturbing the charcoal; wash it well and return it. This will keep me supplied with clean water all day long, but it has to be "dipped" out of the lower jar, which is rather awkward, especially when the flower-pot is pretty full, and consequently heavy. If I were making another, I should get a good wooden barrel and tap.—W. C. HOLMES.

CHROMATE OF POTASH.—There is no great difficulty in the preparation of neutral chromate of potash from the bichromate, but probably J. H. F.'s failure arises from his method. Theoretically, if 8 parts by weight of potassium hydrate be added to 21 parts of the bichromate, the resulting solution will consist of the "neutral" salt, but practically it is better to work with a slight excess of alkali if the product is to be collected in crystals. In this case the proportions of 8 to 20 may be used. Perhaps J. H. F.'s difficulty comes in trying to produce the crystals, as, when the solution is evaporated, there is a strong tendency towards the formation of crystals of the bichromate, and spontaneous evaporation is the only reliable method. Owing to the great difference in solubility of the two salts, if the bichromate be first dissolved, the resulting solution will be so far removed from the point of saturation of the neutral salt that the spontaneous crystallisation will prove a very tedious job. Let the following plan, therefore, be adopted: Dissolve 8 parts of caustic potash in 60 parts of water, and add gradually 20 parts of bichromate in powder. Shake well until dissolved. Although the bichromate would not itself dissolve in the above quantity of water, as it becomes reduced to the neutral condition, its solubility is greatly increased, and, by the time the conversion is complete, it will be found to all go into solution, especially if the vessel be warmed. Then set aside to crystallise.—SYNTAX.

RETOUCHING MEDIUM. — As "Portraitist" does not seem to have received exactly the information he requires, I offer these few hints in the hope that they may be useful to him and others similarly situated. In the first place, he must observe that a retouching medium, to give a uniform surface, must be studied, and all the small points leading to success and failure noted. The very fact that sometimes he obtains a reliable surface proves that the medium is all right, and that, given uniform conditions, success must be assured. After an extended trial of all mediums in the market during the last ten years, I have no hesitation in saying that the very medium against which "Portraitist" is rather severe (I think I have the same as him in my mind) is the very best for retouching *on the film;* but it undoubtedly requires mixing with a greater quantity of *brains* than does an ordinary resin in turps mixture. Let "Portraitist" try this method of application. Make the negative as warm as for varnishing; then, having placed the finger in a piece of soft rag, apply a small quantity of medium by means of cork to rag, and rub over negative in usual manner. This part of the business is the most critical; he must not rub on too much medium or too little, or put it on too thick or too thin, but just the right amount to suit his touch, and this can only be found by trial. Now heat the negative again, and when it cools he should have a surface of the very best; if found not dry enough, heat negative again. If negative is not required to be worked till next day, the first warming will be found sufficient. Use a Hardmuth's "Koh-i-Noor" H pencil for all ordinary and HB for any extra heavy work; *no other pencils* work like these with this medium. Be most careful to keep the cork of the bottle free from "stale" medium, which will accumulate on the sides and the mouth of bottle, and which is so gummy and sticky that if once on the negative it will never dry. Never use the same place in rag twice. The great advantage of this medium, and which places it above all others, is that, with careful varnishing, *it will keep all the work put on,* and only a retoucher can realise what this means. Heat negative slightly when varnishing, and dry up quickly. These remarks apply *only to touching on the film,* for, if applied to the varnished surface, this medium, in my hands, is only a delusion and a snare; and for this latter purpose no better medium can be obtained than that which Mr. Harold Baker offers to send to "Portraitist."—J. E. GOWER.

Our Editorial Table.

CONVENTION REMINISCENCES.

By J. A. Kay, 211, Lord-street, Southport.

MR. KAY modestly terms the photographs he has sent us "a few Reminders of the Convention week." The reminders, however, fill a dainty and artistic little album, and number in all twenty-four. They include views of Fountains Abbey, Ripon Cathedral, York, Studley Royal, Bolton Hall and Woods, Knaresboro', landscape as well as architectural subjects having been chosen. Mr. Kay's work evinces a very high degree of artistic and technical skill, and we shall prize his photographs, not merely as Convention reminders, but for their own intrinsic good qualities.

THE ACME PRINT TRIMMER.

H. J. Redfern, 55, Surrey-street, Sheffield.

THIS wheel trimmer (which sells at 2*s.*) will soon repay the outlay, as it is a handy addition to one's photographic resources. It has a bevelled hollow wheel (Sheffield made), and cuts wet or dry paper



equally well. The wheels and screws are interchangeable, and can be replaced at a small outlay. Again, owing to the wheel being hollow, with the cutting edge flat, it can readily be sharpened to a razor-like edge merely by rubbing on an ordinary oil stone. The Acme Print-trimmer is well and strongly made, and we can recommend it as a capital tool.

PLATES AND PAPERS.

By Dr. STIEFEL. London: Percy Lund & Co.

DR. STIEFEL'S book, which is apparently a translation, deals with the manufacture of the various sensitive papers in photographic use, and treats of their printing, toning, &c. Chapters of the book are also devoted to gelatine dry plates, development, &c. The work might have been condensed, for much of the information, particularly that referring to dry plates, is too meagre to be serviceable, and the translation here and there strikes us as crudely done; but, taken as a whole, the book is useful, and the information relating to the manufacture of collodion, gelatine, and albumen papers is such as is likely to be appreciated by many.

THE SOLAR COLLODIO-CHLORIDE PAPERS.

McGhie & Co., 75, St. Vincent-street, Glasgow.

MESSRS. MCGHIE & CO. have sent us, for inspection, specimen prints on the Solar collodio-chloride papers—"enamel surface" and "matt." The former have all the richness of image and beauty of tone we are apt to associate with good collodion prints, combined with excellence of gradation and purity in the lights. The latter—the "matt"—might easily be taken for surfaced platinum prints, so rich and velvety are the deposits. For the enamel the sulphocyanide and acetate baths are advised; for the matt, the acetate borax gold bath followed by one of potassium chloro-platinite. The directions for using the paper are full, but clear, and, judging by the specimens submitted to us, we have no hesitation in pronouncing the "Solar" collodio-chloride papers capable of yielding results of the highest excellence.

PORTRAITS BY ACETYLENE LIGHT.

John Edward Shaw, Huddersfield.

MR. SHAW, who had noticed our suggestion of last week relative to the adoption by photographers of the acetylene light for portraiture, sends us some portraits taken by the aid of that light. They are soft and harmoniously lighted pictures, equal in every respect to daylight work, and we are obliged to Mr. Shaw for giving us, by means of his excellent work, the opportunity of reiterating our hint to our professional readers to give acetylene their consideration.

ILLUSTRATED CATALOGUE OF THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

London: Harrison & Sons, 59, Pall Mall, S.W. Price 6d.

THIS is the second year that the Society has issued an illustrated catalogue, and the success of the experiment has been so marked that we are entitled to expect that the idea will secure permanent adoption. The catalogue this year is in many respects an improvement upon the first issue. A tastefully bound copy lies before us. Artistic head pieces, and a very effective style and arrangement of printing in the catalogue portion have been introduced, and it is interspersed with reproductions of twenty-two pen-and-ink sketches by Mr. Ralph H. Bayley, the cleverness, beauty, and artistic freedom of which we are the more able to appreciate from having compared them with the originals in the Exhibition. Over thirty half-tone blocks (by Meisenbach) of the exhibits are also given. These are very well printed, and the selection has been made with such conspicuously good judgment as to leave no room at all for objection. In recom-

mending each of our readers to purchase a copy of the catalogue, which has a present interest to, and is assured of a lasting esteem by, all lovers of photography, we append, on our own account, the compliment of recognition by name to Mr. R. Child Bayley, the able and devoted Assistant-Secretary of the Society, upon whom the labour of producing the catalogue has fallen.

News and Notes.

WOOLWICH PHOTOGRAPHIC SOCIETY.—The annual business meeting will be held at St. John's Lecture-room on Thursday, October 8, at 8 p.m.

THE DULWICH PHOTOGRAPHIC SOCIETY.—This Society's First Exhibition is to be held on November 12. The Judge is Mr. Leon Warnerke. There is an Open Class, 2*s.* 6*d.* entrance fee.

THE BRISTOL EXHIBITION.—This Exhibition will be held in December and January next. Entry forms may be obtained of the Hon. Secretary of the Bristol and West of England Amateur Photographic Association, 20, Berkeley-square, Clifton, Bristol.

MESSRS. PERKEN, SON, & RAYMENT advise us that their lease of the premises of their Oxford-street branch having lapsed by effluxion of time, that all business will be transacted from their headquarters, 99, Hatton-Garden, Holborn-viaduct, E.C.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, October 7. Mr. A. Horsley Hinton will deliver a lecture, with lantern illustrations, entitled *Pictorial Photography.* This lecture forms one of the series given under the auspices of the Affiliation of Photographic Societies. Visitors are welcome.

THE Brixton and Clapham Camera Club's Sixth Annual Exhibition will be held at the Clarence Rooms, Coldharbour Lane, Brixton, S.W., on Tuesday, Wednesday, Thursday, Friday, and Saturday, October 6 to 10. The members' classes are: A. Prints (direct or enlarged); B. Prints (open only to members who started photography since January 1, 1895); C. Lantern Slides in sets of four. A silver medal is offered for the best collective exhibit in Class A, and a bronze medal for the second best. Two bronze medals will also be placed at the disposal of the Judges for individual prints not included in the medalled collective exhibits. In Class B a bronze medal is offered for the best print, irrespective of subject. In Class C, a silver medal is offered for the best set of four slides, and a bronze medal for the second. The Open Classes are: D. Pictures (not medalled previous to September 21 at any open exhibition); E. Lantern Slides (not medalled previous to September 21 at any open exhibition). One silver and two bronze medals are offered in each class at the discretion of the Judges. The Judges are Messrs. F. P. Cembrano, jun., Colonel J. Gale, and E. J. Wall, F.R.P.S. A ticket of admission will be sent to each exhibitor. Intending exhibitors of apparatus may obtain full particulars on application to the Secretary, Mr. C. F. Archer, 1, Gauden-road, Clapham, S.W., of whom entry forms and further information may also be had.

THE Reading magistrates, on Friday, September 25, again investigated the remarkable charge of fraud against a man named Walter Henry Mayers, described as a photographer, who was charged with obtaining sums of money from a number of persons by fraud by means of advertisements inserted in a weekly periodical. The advertisement offered enlarged photographs at 7*s.* each, and also various prizes for those who could make the largest number of words out of the letters comprised in the title of a monthly magazine. Amongst the victims was Mrs. White, wife of a Baptist minister at Taunton, who stated that she sent Messrs. Mayers & Johnson, the supposed firm, 7*s.* and a cabinet photograph of her husband, and at the same time asked for the rules of the competition. She received a competition ticket, but she did not receive any enlargement of the photograph. She subsequently saw an advertisement having reference to a second competition, and promising two dozen *cartes.* She thereupon sent another 7*s.* and a photograph. She received an acknowledgment of the same, and then she wrote asking if words now obsolete, but used by old English authors, might be employed. The reply was that nothing but English pure and simple was to be used. Witness afterwards forwarded a list containing 6691 words. This was on September 6, but she received a letter to the effect that no list must be sent in before October 25. Other witnesses gave similar evidence, and Head Constable Tewsley stated that the prisoner was simply living in an attic at a cottage. Witness also found various documents, and saw the advertisements, in some of which it was stated that 1000*l.* was to be competed for, while another offered as a first prize a house in any part of the country valued at 400*l.* The prisoner was committed for trial.

Patent News.

THE following applications for Patents were made between September 16 and September 23, 1896:—

DRYING PLATES.—No. 20,280. "An Appliance for Quickly Drying Photographic Plates after being Developed and Washed." P. H. SAMUEL and J. SAMUEL.

KINETOSCOPIC PHOTOGRAPHY.—No. 20,307. "New or Improved Apparatus or Means by which Successive Photographs can be Produced." M. SAPPEY.

SLIDE CARRIERS FOR LANTERNS.—No. 20,346. "Improvements in and appertaining to Slide Carriers for Optical Lanterns." F. W. HUDLASS.

HAND CAMERAS.—No. 20,349. "Improvements in Hand Cameras." S. D. MCKELLEN.

RELIEF PHOTOGRAPHS.—No. 20,387. "Producing Photographs in Relief." Complete specification. T. C. MARCEAU.

ROCKING DISHES.—No. 20,430. "Improved Apparatus for Rocking Dishes or Trays for Photographic and other Purposes." Communicated by Valentin Zinsli, France. G. C. MARKS.

REFINING STOVES.—No. 20,695. "Improvements in Refining Stoves for Photographers." Complete specification. D. R. V. RIPER.

SHUTTER.—No. 20,768. "An Improved Photographic Shutter." G. HOUGHTON and W. A. EDWARDS.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

October.	Name of Society.	Subject.
5	Bradford	*Scamper through Switzerland and Italy.* H. Hibb-rt.
5	North Middlesex	*Acetylene Gas.* Mr. Hoddle.
5	Richmond	*Photo micrographs.* T. Charters White.
6	Hackney	Members' Lantern Night.
7	Leeds Camera Club	*Enlarging.* Jno A. Hodges.
7	Photographic Club	*Pictorial Photography.* A. Horsley Hinton.
8	Liverpool Amateur	Lantern in Use for Testing Members' Slides.
8	Woolwich Photo. Society	Annual Business Meeting.

ROYAL PHOTOGRAPHIC SOCIETY.

SEPTEMBER 29,—Mr. T. Bolas, F.I.C., F.C.S., in the chair.

Dr. Lindsay Johnson sent for inspection two *carte-de-visite* portraits, taken by a Congo native boy, one of a tribe of cannibals in the region of the Stanley Falls. The lad, who had been brought to England by a missionary, had, on his return to his native wilds, been presented by Dr. Johnson with a set of photographic apparatus, and he had now sent to England these specimens, which, the CHAIRMAN remarked, were very creditable.

The meeting was devoted to a demonstration of

THE APPARATUS IN THE EXHIBITION,

most of which has already been described in our columns. It included the Incanto acetylene-gas generator and a lantern fitting for acetylene gas (Messrs. Thorn & Hoddle); the "Memorandum" and 5×4 Frena cameras (Messrs. R. & J. Beck, Limited); the "Scientific" hand camera (Scientific Hand Camera Company); Sanderson's and the "Holborn Combination" cameras, fibre vignetters, printing frames, &c. (Messrs. G. Houghton & Son); "Censabul" focussing chamber and triple-lens finder (Messrs. Adams & Co.); process and enlarging camera, &c. (Messrs. Watson & Sons); several cameras and a "cyclist's" aluminium stand (Messrs. J. F. Shew & Co.); an improved lantern-slide camera (A. E. Bingemann); and a "Chariot Polyposes"—an apparatus for making photographic doubles, or photographs in which the same person appears in several positions, and taking the form of a rectangular frame sliding in front of the focussing screen and dry plate by means of an endless screw (M. Victor Bracq).

Mr. HUGH L. ALDIS, B.A., exhibited the Dallmeyer "Stigmatic" portrait lens, which has been fully described in the columns of THE BRITISH JOURNAL OF PHOTOGRAPHY. He said the principal feature of these lenses was their extreme rapidity, combined with perfect sharpness all over the field, there being complete freedom from spherical aberration at the very large comparative aperture of one-fourth the focal length. He did not think that any portrait lens had yet been introduced which would give such sharp marginal definition over a comparatively large angle. The novelty in construction lay in the fact that the flint lenses were all of lower refractive index than the crown lenses, and it was by this means that the correction for flatness of field, while retaining a very large aperture, had been attained. Spherical aberration could be introduced if required by partially unscrewing the back combination.

The CHAIRMAN remarked that the great advantage of the lens was that it got rid of astigmatism, which was an undesirable description of unsharpness under all circumstances.

Mr. T. R. DALLMEYER said the instrument was particularly suitable for stellar photography, for which purpose it would give crucial flatness of field over an angle of 40°. He thought Mr. Aldis was to be congratulated upon the production of a lens far in advance of the results of foreign competitors.

At the conclusion of the examination of the apparatus Messrs. Watson & Sons gave a demonstration of the X rays by means of a fluorescent screen, in which considerable interest was manifested.

The Hon. Secretary (Mr. Chapman Jones) was unfortunately unable to attend the meeting, as he was suffering from an attack of influenza, the announcement of the fact provoking a general expression of sympathy.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 24,—Mr. A. Haddon in the chair.

Mr. P. EVERITT passed round a number of photographic copies of engravings which he had recently acquired, and which had been done some twenty or thirty years ago. They were printed on plain salted paper, and toned with gold. The salted paper (he was told) had been prepared in a special manner, so as to ensure a certain effect, and he proposed conducting some experiments with a view to discovering something about the procedure peculiar to this paper. He remarked on their state of preservation after such an extended period since their production, and held them as good evidence of the permanence that could be obtained in silver printing. He indicated one which would compare very well with a platinum print. They were copied with a Ross's

symmetrical lens of about 10 inches. He made a present of a print to the Association.

Mr. A. L. HENDERSON said that, in continuation of his experiments as to the cause of certain bands which developed up across plates exposed in particular dark slides, and which in some cases were apparently of an accelerating and, in others, a restraining nature, and the results of which he had communicated recently in a note before the Association, he had compared the effects of fresh with decomposed glue for fixing the cloth hinges. He procured some best Scotch glue, and soaked it in water, when, owing to decomposition, a lot dissolved out, the smell at the same time being unpleasant. With this he glued the hinges and exposed a plate, which showed, on development, an accelerating action. He then precipitated some of the glue with alcohol, washed it in water to free it from the alcohol, and dissolved it at a low temperature. A plate was then subjected for a long time to the influence of a piece of cloth treated with this glue, but without any action whatever, showing at once that the use of decomposed gelatine was decidedly bad. He therefore recommended the precipitation of the glue as above as a means of overcoming the effect produced by exposure to the moisture of the air.

Mr. HADDON said by this process one practically prepared gelatine from the ordinary glue, so why not use gelatine?

Mr. EVERITT said that known as French glue, which was of an amber colour, would, from its great hardness, be superior, as it would not attract moisture so readily.

In consequence of the retirement from office of Mr. Everitt, Mr. T. E. Freshwater will assume, until the next annual meeting, the post of Hon. Secretary, while Mr. E. J. Wall has consented to serve in the capacity of Hon. Recorder until the same date.

PHOTOGRAPHIC CLUB.

SEPTEMBER 23, Mr. E. W. Foxlee in the chair.

Captain HAYES, who was present as a visitor, showed an interesting series of instantaneous photographs of horses. These photographs illustrated the various phases of the canter of an Arab polo pony. They were taken consecutively with a Newman & Guardia camera, fitted with a Zeiss lens working at *f*-6·3, and fitted with a Celeritas shutter working between the lenses at a maximum speed at $\frac{1}{100}$ second. The object of the photographs was to demonstrate that the motion of both the near and the off legs of a horse is similar, and Captain Hayes had succeeded in happily choosing the exact moments at which to make the photographs. He lays it down as a rule that all his pictures of horses shall be made against a clear sky and at right angles to the line of sight, and at a distance of twelve yards from the animal. He stated that he used Paget XXXXX plates, and that he found it advisable with very short exposures to commence development in absolute darkness. Captain Hayes was anxious to have the opinion of the members upon the relative suitability of a focal-plane shutter and such a one as he was using, and suggested that some one might be disposed to take up the question and make a series of practical tests with apparatus identical in all respects except the shutter.

Mr. FRY deprecated such a test. He said he would prefer to rely upon a calculation of the efficiency of such instruments by mathematical means.

Mr. MACKIE supported this position.

Mr. BRIDGE sympathised with Captain Hayes's preference for a practical test.

Mr. FRY said that he had had the advantage of seeing Mr. Newman's apparatus (which he believed he had invented as well as constructed) for the purpose of testing the speed of shutters. He believed that, if the matter were referred to him (Mr. Newman), his instrument would make all the measurements and give all the facts which the Captain required.

Mr. FOXLEE raised several technical points, referring to the distortion, which was, in theory, the weak point of the focal-plane shutter.

Captain HAYES said that his remarks must not be taken in any sense to apply to the makers of apparatus, but simply to principles involved.

Mr. Walker, of Leeds, a visitor, was welcomed by the meeting.

Mr. FOXLEE said that it used to be the habit of the Club to extend an open invitation to country photographers visiting London during the time that the Exhibition of the Royal Photographic Society was open. He thought that the Club (although it was well known they were always pleased to see country photographers) might, by a letter from their Secretary through the press, offer a special invitation at this time.

The SECRETARY said that he had no doubt every one present would agree with Mr. Foxlee, and that he would send a letter to the editors of the several papers.

The meeting then proceeded to the subject of the evening,

HALATION.

Mr. DRAGE mentioned that recently he had seen a recommendation to place one dry plate behind another for the purpose of minimising halation.

Mr. MACKIE said he should like to know how the author of this idea thought it would act. The rays which passed through the back of the plate were not those which caused halation.

Mr. FRY said that the first principle to be observed in backing a plate was to have the backing in optical contact with the back of it. He would expect the method suggested to act detrimentally if at all.

Mr. HAES asked for a definition of halation.

Mr. MACKIE replied that he defined it as the effect upon a film caused by a reflection of certain rays of light from the back of the plate, but many things were called halation which were really a correct reproduction of effects as seen by the eye. In his opinion a full exposure and well-restrained development tended to minimise the effects of halation. The idea was well supported by the results in the Watkins Developing Competition.

Mr. NESBIT had found just as much halation with films as with plates. He thought that halation was due quite as much to the lateral or spreading action of light in the film as to the causes which Mr. Mackie had referred to.

A brief discussion ensued upon the presence of ladies at the Club's Travellers' Nights. The consensus of opinion among the members present was that ladies should be welcomed on those evenings, but that the ordinary regulations as to smoking would be in force.

Croydon Camera Club.—The meeting on Wednesday, 23rd ult., was preliminary to the inauguration of the winter session, which begins on October 7, and which promises to be unusually interesting. Important and useful lectures on various photo-technical matters have been arranged to be given by Messrs. W. Friese-Green, A. Haddon, Horsley Hinton, A. Bellin, the Rev. F. C. Lambert, and other distinguished photograpers. The public lantern shows will be held on the same basis as has given such great satisfaction during the past six years. Amongst the subjects of the first few technical lectures will be a complete demonstration of the latest methods of *Shadowgraphy with X Rays*, also *The Utilisation of the Acetylene Light for Photography*. Mr. Burn was bearer of an invitation from the Dolphin Swimming Club for a party of members to attend and takes flashlights of the competitors at the forthcoming costume entertainment. It was arranged to ask certain members skilled in the above branch of photography to accept the above invitation. The election of the following new members was notified as having taken place since the last meeting:—Mr. H. L. S. Richardson, LL.M., B.A., and Mr. C. Nightingale.

Dulwich Photographic Society.—Mr. H. C. Jackson in the chair.—The Hon. Secretary, Mr. H. J. Ellis, produced a letter from Sir J. Blundell Maple, M.P., the President, expressing his regret at the inability of Lady Maple and himself attending the first Exhibition of the Society, to be held at the Constitutional Club, East Dulwich Grove, on Thursday, November 12. Sir J. Blundell Maple kindly enclosed a cheque towards the expenses of the Exhibition. Mr. S. Withers gave a most successful demonstration of lantern-slide making, the slides afterwards being thrown on the screen, the lantern being kindly lent by H. Jennings, Esq., late proprietor of the historic Greyhound Hotel, Dulwich. Slides were afterwards exhibited by Messrs. F. Thomas, F. F. Thomas, E. W. Beer, G. E. Smith, and H. J. Ellis. The next meeting was arranged for Tuesday, October 6, when the Hon. Secretary will give a demonstration for beginners on *Intensification and Reduction*.

Hackney Photographic Society.—September 22, Mr. R. Beckett presiding.—Lantern Night. A very fine series of slides on the subject of *Travels in Sicily* was shown by Mr. A. L. HENDERSON. The slides were good both in quality and subject, and Mr. Henderson's description was most interesting. Members' slides were shown by Messrs. Guest and Walker.

North Middlesex Photographic Society.—September 28, Mr. S. E. Wall in the chair.—Mr. G. A. Barton, 49, Sussex road, Holloway, and Mr. G. F. Humbly, 2, Gresby-road, Hornsey-lane, were nominated for membership. Messrs. A. J. D. Forster and Henry Crouch were balloted for and duly elected. Mr. E. DOCKREE, of the Brixton and Clapham Camera Club, then read a very practical paper on

LANTERN SLIDES AND THEIR PRODUCTION.

He said he always used gelatino-bromide plates, and maintained that as fine results could be obtained on them as on collodion, with the added advantage of rapidity, which was necessary when slides were produced by reduction in the camera. He always reduced his slides, and said a finer result was so obtained than by contact printing. You could obtain what colour you preferred by regulating the amount of bromide and carbonate of ammonia, giving longer exposure the warmer the tone required. He sometimes found a redeveloper useful, and gave a formula: A. Pyro, 6 grains; citric acid, 15 grains; distilled water, 1 ounce. B. Silver nitrate, 30 grains; distilled water, 1 ounce. Take sufficient of A to cover the plate and add a few drops of B. A thorough washing to remove hypo was necessary before using this. A clearer was sometimes necessary, and hypo, with a few drops of ferridcyanide of potash was very good, but he thought landscapes were sometimes improved by a slight veil. He got all his clouds on the same plate by first using a weak developer and then a stronger restrained one. After a very fair discussion, he passed through a magnificent collection of slides, which were very well received.

Bradford Photographic Society.—On September 21, 1896, Mr. P. R. SALMON delivered a lecture on

FIGURE STUDIES AND PICTORIAL PORTRAITURE

in the Club-rooms, Sunbridge-road. Mr. Salmon, who is well known in photographic circles, is a painstaking worker and constant exhibitor of *genre* studies, managed to entertain his hearers for over two hours, and to impart considerable instruction at the same time. The pictures thrown upon the screen were entirely the lecturer's own work, and included some capital studies of young ladies representing *Little Lord Fauntleroy*, *We are Seven*, *Lucy Gray*, *Song of the Shirt*, &c. At the close of the lecture, a vote of thanks was proposed by the Chairman, Mr. Walter Booth, to which Mr. Salmon responded, mentioning the fact that he was leaving the town, but he hoped that that would be by no means his last lecture before that Society.

Leigh Photographic Society.—The Annual General Meeting was held on the 24th inst. The President (Mr. M. F. Burrows) presided.—The balance-sheet was passed, with the balance of 1*l*. 16*s*. 8*d*. in hand, and the officers elected were:—*President:* Mr. M. F. Burrows, J.P.—*Vice-Presidents:* Dr. Joseph Jones, Messrs. Robert Leigh, T. Lee Syms, James Ward, B.A., J. H. Stephen, W. Hampson, and T. Peters.—*Committee:* Messrs. J. Berry, T. G. Hirst, W. Crouchley, T. Mercer, and P. Seddon.—*Treasurer:* Mr. T. Haddock.—*Secretary:* Mr. W. R. Moore. Rules were discussed, and arrangements were made for the syllabus.

Liverpool Amateur Photographic Association.—September 24, the President (Mr. J. Sirett Brown) in the chair, when eleven new members were elected.—The medal offered by the President in the Dolgelly Excursion Competition was presented to the winner, Mr. F. Anyon. The President drew the attention of members to some of the principal items in the winter programme,

and announced that a complete list wou'd shortly be issued. Dr. LLEWELLYN MORGAN then delivered his lecture, entitled

SUMMER AND WINTER VISITS TO THE ENGLISH LAKES,

the places visited including Windermere Lake, Ambleside, Langdale Valley, Rydal Water, Grasmere, &c. The lecture, which was very interesting, was illustrated by about 130 lantern slides from negatives taken by the lecturer. A hearty vote of thanks to Dr. Morgan concluded the meeting.

FORTHCOMING EXHIBITIONS.

1896.	
Oct. 2-Nov. 7	Photographic Salon, Dudley Gallery, Piccadilly. Alfred Maskell, Dudley Gallery, Piccadilly.
„ 2-Nov. 12	Royal Photographic Society. R. Child Bayley, 12, Hanover-square.
„ 6-10	Brixton and Clapham Camera Club. C. F. Archer, I Gauden-road, Clapham, S.W.
November 12	Dulwich Photographic Society.
December 3, 4.....	Aintree Photographic Society. E. P. Heron, 2 Tilney-street, Orrell Park, Aintree, Liverpool.
Dec. 1896-Jan. 1897	Bristol International.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

"SOMETHING FOR NOTHING."

To the EDITORS.

GENTLEMEN,—I enclose you "a puzzle" in the form of a typed letter, received a day or two ago. What is it? and what does it mean?

I was under the impression a picture critic went round the Exhibition or Exhibitions, and picked out there such examples as were thought desirable, and said what there was to be said regarding their faults or otherwise for the benefit of the public, exhibitor, or critic. It would seem I have been mistaken, my own impression of the effusion in question being that it is a piece of "unadulterated cheek," to put it mildly.

Why should I, or any other exhibitor, be called upon to supply "copy" for this F.R.P.S., F.G.S., and the rest of it—copy for which *he is to be paid?* and, forsooth, after going to the trouble and cost of producing them, they are to be, at his sweet discretion, reproduced in either of the publications named by him, or in others of a similar character.

Evidently he is a man of business, for, enclosed with this demand, is a slip advertisement of some book or other written by himself, and on sale; but why it should be sent—the call for print or the advertisement—is a puzzle to

A DISGUSTED RECIPIENT.

September 23, 1896.

"34, *Birdhurst-road, Croydon, September* 16, 1896.

"DEAR SIR,—I have been requested by the respective editors of the (1) *St. James's Budget* and the (2) *Photographic Times* of New York to supply illustrated critiques of the Royal Photographic Society's and the Salon's Exhibitions.

"If you are exhibiting anything likely to be suitable for reproduction, as aforesaid, I should be much obliged by your forwarding me a print, or prints, *with as little delay as possible.*

"Inasmuch as the usual custom, where Exhibition pictures are reproduced along with a critique, is that no fee is offered, unless you explicitly state that you require payment and name the sum, none will be made.

"Any prints sent in will, if suitable, be, at my discretion, reproduced in either of the above-named publications, or in other publications of a similar character, accompanied by a critical notice of the Exhibition, unless I am specially advised by you to the contrary.

"Believe me,

"Yours very faithfully,

"HECTOR MACLEAN.

"P.S.—For the information of such as may not be acquainted with the *Photographic Times*, it may be stated that it is the leading illustrated monthly publication in the world devoted to photography, being notable for the high class of the photographs it reproduces, and for the perfection with which such reproductions are printed. "H. M."

[Having brought the foregoing letter to the notice of Mr. Hector Maclean, he sends us the following reply.—EDS.]

To the EDITORS.

GENTLEMEN,—The letter of "A Disgusted Recipient" shows all the malevolence and inaccuracy which we look for from the hateful anonymous traducer.

Fortunately, along with the above letter, the typed communication of mine referred to is also printed. It supplies a complete refutation of the gratuitous mis-statements of this person, whose syntax is so curious.

By inspection of the last-named document it will be seen that, contrary to your correspondent's allegation, photographers are distinctly invited not only to name the sum they want for permission to reproduce, but also to indicate the publications which they would like their prints to appear in.

At the same time there are many exhibitors who, aware of the extra trouble and expense involved in arranging for illustrated *critiques*, and further, recognising that such articles serve to popularise the photographer's work, to advertise the Exhibition, and, generally, advance the practice of pictorial photography, are desirous of giving every facility for their prints to reach a yet wider circle than the visitors of an exhibition.

Let me take the opportunity of emphasising that it is consequent on such reckless abuse as that under consideration that many who would at the present moment be useful and brilliant, active members of the photographic commonwealth have gone into retirement, fearful of being subject to recurrent showers of ill-bred impertinence.

Personally, I usually take such spiteful attacks for what they are worth, which is nothing. In the present instance I must, however, make an exception, for, thanks to your correspondent, many photographers will be for the first time made aware that I am open to receive prints for the purpose described.

Thanking you for the courtesy extended whereby I am enabled to promptly answer the aspersions cast upon me,—I am, yours, &c.,

September 26, 1896. HECTOR MACLEAN.

THE POISONS EXCITEMENT.

To the EDITORS.

GENTLEMEN,—Your correspondent, "Pharmacian," states that the treatment of this subject in your pages is calculated to afford considerable amusement. I must congratulate him upon his amusing contribution.

He asks, "What is a photographic dealer?" He then refers to "tinkers, tailors," &c., "et hoc genus omne, cheerfully innocent of chemistry, optics, mechanics, and other collateral sciences," the latter part of which applies admirably to the druggists who go in for the photographic trade on the "sell-the goods" principle, but who frequently lack the "smattering of photography." A druggist who, some little time ago, thought of taking up the "photographic trade," asked me one day what was the difference between dry and wet-plate photography. So many of his customers asked him for hypo that he was anxious to know what it was used for. He went in for photography himself some years ago, but never used hypo.

Mr. "Pharmacian," like many other of your correspondents, has tried to drag a red herring across the track of the discussion, and divert our attention from the real points at issue, which I take it are these:—

Firstly, why should the name "chemist" be appropriated by druggists, the majority of whom have little knowledge of chemistry, and denied to those who have a special knowledge of the subject? A complete, full, and particular knowledge of the *materia medica* does not make a chemist, and even many doctors willingly admit that their own knowledge of chemistry, properly so called, is not extensive.

Secondly, why should druggists have a monopoly of the sale of poisons, while others to whom their sale is important should not be allowed to sell them at all? If druggists want to monopolise the sale of opium, they can do so; but there is no reason why they should also monopolise the sale of certain other poisons for which they have practically no demand, and which many of them do not keep.

Thirdly, why is the schedule of poisons so ridiculously incomplete, and, if chemists are so anxious to protect the public, why don't they take steps to have it properly revised? They are making a great fluster over the question of the sale of carbolic acid, *which is an important article of commerce*, but say nothing about other unscheduled poisons, *a monopoly in which would not be so valuable.*

Fourthly, why does the Pharmaceutical Society allow the Poisons Act to be evaded by the free sale of patent preparations containing scheduled poisons? and why do druggists themselves so frequently omit to carry out the regulations of the Poisons Act? How is it that in almost every household we find bottles of spirits of salts and oxalic acid, which are used for cleaning purposes, and can be obtained without any trouble, in spite of the fact that they are frequently used by suicides? I have often bought scheduled poisons from druggists and others, and have never signed a poison book in my life.

A *photographic dealer* once refused to sell me some potassium ferricyanite, because he did not personally know me, and a well-known firm of *manufacturing chemists*, who knew me well as a customer, would not let me have an ounce of mercury bichloride unless I brought a friend as a witness to the transaction. Having no friend handy, I went to a *pharmaceutical and photographic chemist*, who knew me equally well, and simply told him to send it, *which he did.* If ever there is any difficulty about obtaining mercury bichloride, we can always get calomel and convert it.

Our friends the druggists should put their own house in order before interfering with, and prosecuting, other people. Judging by their letters to you, however, they seem to be remarkably well satisfied with themselves and with their own accomplishments; but, apparently, other people—photographers, doctors, and the more educated members of the British public—do not have quite such an exalted opinion of them. The way in which many of them do business is not calculated to inspire confidence. Why, when we take a prescription to be made up, does the pharmaceutical "chemist" ask for details of the particular ailment the medicine is intended for? A doctor once told me to get a certain pre-

paration from a druggist, and also instructed me to tell him *to give me the genuine article, and not something of his own composition!* Why did the doctor give me that advice? and, when I acted upon it, why did the chemist smile so mysteriously? A short time ago an eminent London surgeon remarked to me that no druggist could resist the temptation of becoming a quack. What did he mean?

We have heard a good deal about "cutting" chemists; I have never come across one of this variety. One tried very hard once to get eighteenpence a gallon out of me for some distilled water, but had to put up with eightpence, some plain speaking, and the loss of my custom. At another time I was charged eighteenpence for a bottle of medicine, and a few days after the same man made an audacious attempt to get half-a-crown out of me for a second bottle of the same stuff, but failed ignominiously. His excuse was, that *he had forgotten what he had charged me the first time.* This sort of thing is a common experience; it cannot be described as "cutting," but might, with every excuse, be described as —well—something else.

Druggists, or pharmaceutical "chemists," are, generally speaking, peculiar beings, and they manifest their knowledge and conduct their business in peculiar ways which do not somehow appeal to me, which ways also are quite different to those of other tradesmen. They have a failing that is, unfortunately, rather common to scientific men, that is, bumptionsness, the exhibition of which is generally amusing. Their pet schedule of poisons, as a document, is also amusing; it is superior even to the list of infectious diseases which includes croup and leaves out measles.—I am, yours, &c. NEMO.

September 25, 1896.

THE PHOTOGRAPHIC CLUB: AN INVITATION.

To the EDITORS.

GENTLEMEN,—I shall feel obliged if you will kindly allow me to make your colnmns a medium for inviting any provincial photographers who may be in London for the Exhibition of the Royal Photographic Society to the meetings of the Photographic Club.

We meet every Wednesday evening at eight o'clock at Anderton's Hotel, Fleet-street, E.C. The following is our programme for October, and we shall be pleased to welcome any of our country friends who may favour us with a visit:—

October 7.—*Pictorial Photography*, with lantern illustrations. Mr. A. Horsley Hinton. October 14.—Demonstration. *Acetylene Gas for ordinary use and lantern projection.* Mr. C. Hoddle. Members' lantern slides, &c. October 21.—Members' Open Night. October 28.—Travellers' Night. *Switzerland*, with lantern illustrations. Mr. T. Charters White.

Thanking you in anticipation, I remain, yours, &c.,

F. A. BRIDGE, *Hon. Secretary pro tem.*

Dalston-lane, London, N.E., September 26, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Thomas Bourke, 213, South-street, Perth.—*Photograph of Right Rev. James Smith, bishop of Dunkeld (cabinet, half-length).*

John Spark, 49, York-place, Perth.—*Two photographs of Rev. John Addie, minister of Wilson U. P. Church, Perth. Two photographs of Rev. P. A. G. Clark, minister of Free West Church, Perth. Photograph of Rev. John Symon, minister of Free St. Paul's, Perth.*

RECEIVED.—MOULT BROTHERS, NORMAN, P. STOW, C. H. PRICE, HELIOS. In our next.

STEREOSCOPE.—We will endeavour to get the information for you by next week.

ALFRED WILDMAN and others who send us copies of West of England newspapers referring to Mr. Bennetto's "colour photography" are thanked.

DETENTION OF NEGATIVES.—G. H. STANFORD. A death in the family is, perhaps, responsible for the delay. Can you not get a London friend to call upon the firm for you?

BOOK ON PROCESS WORK.—PROCESS WORKER says: "I would like to know the best book I can purchase on process work."—In reply: *The Half-tone Process*, by J. Verfasser, published by Percy Lund & Co., Amen-corner, E.C.

ASSISTANT *versus* EMPLOYER.—PADDY. To recover the amount claimed, you must proceed in the County Court. We are not sure that you would be successful, and you had therefore better lay your case before some respectable solicitor.

FLASHLIGHT.—F. W. TARSELL. We would suggest the use of two or three flash lamps working simultaneously. Messrs. Marion & Co., we believe, supply such an arrangement, and probably other dealers. You will find a few useful hints in an article published in the JOURNAL of September 11, and in the present number.

LANTERN SLIDES FROM THE OLD MASTERS.—F. B. J. says: "I want some lantern slides of some of the pictures in the National Gallery. Should I be doing wrong in copying some of the photographs of them now being published, as there can be no copyright in the pictures now?"—Yes, doubtless, you would. Although there is no copyright in the paintings, there is in the photographs made from them. You will be quite safe if you copy the paintings, but the reverse if you copy the photographs.

MOUNTING PRINTS. BROMIDE PAPER.—C. F. WYNNE asks: "Would you kindly inform me: 1. Is there any method of removing albumen prints from mounts besides the ordinary soaking in water—mountant made from ordinary starch? 2. I have some bromide paper, Marion's and Ilford, in stock for the past twelve months, kept in a dry place, free from strong light, &c. Now, that I wish to do some enlargements, would like to know from you as to its keeping qualities, if some should be in good condition."—1. The method suggested is the best. 2. Try a piece of the paper, and see if it is in good condition. If it has been properly kept, we should expect it would be found so.

AGREEMENT.—OPERATOR writes: "I made a three-year agreement with the house I am now with, which expires at Christmas. There is a clause in the agreement that I am not to set up in business, or enter the service of another photographer, within half a mile of the studio under a penalty of two hundred and fifty pounds. Now, there is a house to let within a few doors off which I can have, and put up a studio. Can the penalty be enforced, as, if not, it is a good chance for me?"—Certainly it can, and it would be very dishonourable on your part to make an agreement and attempt so deliberately to break it. If you pay the two hundred and fifty pounds, of course you will be at liberty to do what you chose, and no one can find fault with you.

RETOUCHING MEDIUM.—RETOUCHER says: "Mr. Harold Baker's remarks on retouching medium are very interesting. I notice that he does not refer to the mixture of "turpentine and resin" by themselves. Can you tell me what objection, if any there is, to its use, as I know several professionals who use it and prefer it to any other? Some time ago you promised us an article on the "tooth" that is frequently found on the film of a negative without any preparation at all. I have watched for it, but in vain."—The mixture of turpentine and resin is very good indeed. The only objection to it is that, if the negative is varnished, the retouching is disturbed, and, in some cases, entirely removed. The promised article will appear shortly.

TONING DIFFICULTIES.—PERPLEXED PRINTER writes as follows: "I am very perplexed at times over the uneven toning of my prints. I have used several brands of P.O.P. in my time with success, but the firm I am with now use the —— brand. In dry weather it works splendidly, but in damp or hot weather I cannot be at all certain that my prints will be passable. I follow out the maker's instructions to the letter, but I get very uneven toninga, such as yellow half-tones and very red shadows. If I tone the prints for the correct colours in the high lights, the depths are not toned enough, and, if I tone for the correct colours in the shadows, the high lights turn a muddy, yellowish colour. My predecessor used to get a splendid even warm tone, but I know he used a formula of his own. I am in fear of losing my berth if this coutinues, but try as I may I cannot alter it. Could you help me in this? I have tried using more gold, but that gives a too black a tone, and again a little less gold, but that seems worse than ever. Trusting you will answer this as soon as possible." — Personally we have had no experience with the brand of paper named. Possibly another toning formula than that recommended by the makers would answer better in our correspondent's hands. Probably the employer would substitute one or other of the well known brands for that now used if our correspondent could get on better with them.

EXPENSES IN LAW-SUITS.—EIKONOGEN says: "I have a question that I should like your opinion on. It is this: I have been doing some photographing for a client. He has paid what I charged; but I and my assistant had a subpœna to attend a law case in the London Courts, these photographs having been taken for one side, to show what ought to be done or what ought not. These photographs were for the Judge to see, and I and my assistant were there to answer any question with regard to them, also to swear to the taking of them. But what I want to know is, What is the usual fee in such circumstances? I must explain. I do my own operating, and had to leave my studio without having any one to carry it on. Thus, wanting my assistant operator as well, I arranged as well as I could, but had no one who could take a photograph, and, of course, there was some loss; and it was of no use engaging any one, as the case went for so long, expecting to come on, first in a few days, then weeks waiting. Well, I and my assistant were in London two days, and I charged a fee of 2*l.* 2*s.* for myself per day, and 10*s.* 6*d.* per day for my assistant; for hotel expenses, 21*s.* per day for self, and 10*s.* 6*d.* per day for assistant, they allowing railway fares and cab fares. Now, when I sent in my account for this, they write me that I am not to have any more than 21*s.* per day, including fee and hotel expenses, and 10*s.* 6*d.* for assistant. This seems a ridiculous sum for me to receive for my time and inconvenience, and they say they need really only pay me 16*s.* a day, as that would be all the Court would allow. This for leaving my business and going to London to attend at the Court. They say that I cannot claim as a professional, but I have always been under the impression that photography was a profession."—In reply: It is, and always has been, a vexed point as to whether it is a *profession* or not in law. Our correspondent should have arranged terms with his client before he undertook the work. That is what is done by most experts in photography in similar cases. The charges made seem reasonable; but, whether they can be enforced, we cannot say. We presume our correspondent has been engaged on the losing side, hence the demur to the charges.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

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OUR FORTHCOMING ALMANAC.

The British Journal Photographic Almanac for 1897 is now in an advanced state of preparation. A feature of the volume for the past thirty years has been the co-operation of numerous friends and readers of the Journal, and the Editor takes the opportunity to express the hope that the support so kindly placed at the disposal of his predecessors may be continued to him.

We especially invite contributions on topics of practical interest, and should feel obliged if the articles and any accompanying sketches are sent to us at the earliest possible date.

Secretaries of Societies, and especially of those established since the appearance of the last Almanac, will oblige us by forwarding lists of officers and other details for inclusion in the Directory of Photographic Societies, in order that the list may be made as complete as possible.

The Publishers wish us to remind intending advertisers that the announcement pages of the Almanac are filling rapidly, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

EX CATHEDRÂ.

We are informed that the matter of the Research Fund of the Photographic Convention of the United Kingdom was brought to the notice of the Convention Council last week, with the result that the Research Grants Sub-committee was dissolved, and the Council itself was empowered to make grants in aid of original research, and to invite suitable persons to take up the work. With commendable promptitude the Council at once decided to invite Messrs. Haddon and Grundy to undertake an investigation into the subject of the influence of the strength of the hypo solution on fixation—in other words, the exact strength of hypo solution necessary for perfect fixation.

* * *

We are also pleased to announce that Mr. R. P. Drage has consented to retain the Secretaryship of the Convention. The labours of the position are, at times, extremely heavy, and such as are calculated to damp the ardour of the most enthusiastic official. In future, however, much of the work entailed by the organization of the Convention meetings will probably be shared by individual members of the Council, or possibly Sub-committees, so that Mr. Drage will be relieved of much of the heavier routine and other work, while still retaining the General Secretary and Treasurership. We sincerely hope that, when the details of this highly desirable scheme come to be settled, there will be no lack of willing volunteers to support Mr. Drage.

* * *

The balance-sheet of the Convention Leeds meeting is printed in another part of the Journal, and discloses a very satisfactory state of affairs. The accumulation of money by such an institution as the Convention is obviously not a matter of urgency beyond a point where something more than solvency is assured, and therefore, if future meetings of the Convention are profitable, and the Research scheme continues in active operation—both of which things we hope and believe will come to pass—the reproach that the Convention does nothing for photography will no longer hold good—nay, more, visitors to these pleasant annual gatherings will have the rare happiness of feeling that, in their enjoyment, they are contributing something towards the progress of photographic science.

* * *

We are informed that the secret process for preventing

halation that was recently referred to in these columns, and for which a charge of 5s. was asked, consists of the following device: In front of the lens an opaque body is temporarily placed, or held, so that, upon the portion of the plate that is receiving the most brightly lighted, or halated portion of the picture, the illumination is reduced. Will some purchaser say if we have been rightly informed?

* * *

THE aggrieved assistant who cannot obtain the return of specimens he has sent when answering advertisements makes his appearance several times during the year in these pages. One of the unfortunate class again addresses us: "You will see in your last week's issue that I was advertising for a situation as operator, dark-room manager, and retoucher, in reply to which I received several letters, asking for particulars and proofs of my work, which I duly sent to them, and up to now I have not received a reply to my letters, nor have my proofs been returned. Do you think, Sir, that these men are answering advertisements appearing in your paper in order to gather a collection of photographs, which their own incompetency will not allow them to produce for themselves, and, in consequence, depriving such as myself of every available specimen from which he hopes to procure a situation? Perhaps I have not given them time to return proofs. Any how, there is a man who, is advertising this week, and is still holding my proofs. If he is seeking the services of other men, why not return my work? His letter is headed by his name, &c., stamped with an indiarubber stamp, which has the appearance of a memorandum got up for the occasion. If he requires so many assistants, and has such an extensive business, why hasn't he printed memoranda? I shall be glad if you will kindly advise me what to do in these matters."

* * *

OUR advice to photographic assistants when submitting specimens has been so often given in our columns that we should have imagined there was hardly one of the class who was unaware of our reiterated admonition to write their names and addresses across the photographs with which they are temporarily parting. If this does not always ensure their return, it at any rate interposes an obstacle to the dishonest use of photographs illicitly obtained. We shall at all times be happy to hear from assistants whose specimens are wrongfully detained, and will do our best, if stamped addressed envelopes are enclosed, to secure the return of the photographs. At the same time, we feel it desirable to here state that we have many times taken up cases of alleged improper detention which, upon investigation, have turned out to be caused by the carelessness of the sender of the photographs in failing to give facilities for their identification and return.

DIRECT TRICHROMATIC HALF-TONE NEGATIVES.

THAT there is a much greater interest being taken at the present time in three-colour work is evident, and the fact that, commercially, the half-tone process is practically the only one used naturally suggests the question as to whether such half-tone negatives cannot be prepared direct in the camera, and thus one operation, if not considerable time, be saved.

Wet collodion probably still holds its own for half-tone negative-making, although, it is being somewhat hardly pushed by the photo-mechanical dry plates, and for three-colour printing, it is absolutely essential, if the former be used, that the plates should be rendered colour sensitive. There is no difficulty in this if certain requirements are fulfilled, and which entail not only considerable care, but also special preparation of the collodion and bath.

Probably every commercial collodion is intended for use with bromo-iodide salts, and it is a fact, well established by the researches of Vogel, Eder, and Schumann, that the iodides do not take kindly to colour sensitising; therefore it is necessary, even if one purchases the collodion, to replace the iodiser by a bromising solution. On the other hand, if the bath or collodion is quite free from iodide, the sensitiveness of the plates is so low as to necessitate an increase of exposure, without any screen, of at least three times that of a normal bromo-iodide wet plate.

Probably the best-known orthochromatic wet process is that suggested by Vogel in 1884, and which has remained almost unaltered to the present time—unaltered and unamended because, in many cases, it has been replaced by the orthochromatic collodion emulsion and gelatine plates.

The raw collodion is best prepared from celloidin, because one can rely upon obtaining it always of constant composition, and free from any traces of acids, which would seriously interfere, if not totally destroy, the action of the dye. A two and a half per cent. collodion solution is to be preferred, though, for those who prefer a thin, flowing collodion, this may be reduced to two per cent., but it will be found, when the bromiser is added, that the more viscous collodion is not too thick.

The bromiser is made by dissolving 200 grains of cadmium bromide in 5 ounces of absolute alcohol, and filtering.

One part of this bromiser is mixed with three parts of a two and a half per cent. collodion. If only a two per cent. collodion be used, then the cadmium bromide must be reduced to 160 grains for the 5 ounces.

The silver bath is not quite of the usual formula, and, in fact, it must at once be recognised that a fresh silver bath must be made up and reserved for these colour-sensitive plates alone; the ordinary silver bath, whether new or old, is practically useless, and, further than that, if it is used, cannot be again used for ordinary work.

The best silver bath for this work is:—

Silver nitrate	480 grains.
Distilled water	10 ounces.
Solution of potassium iodide (one per cent.)	14 ,,
Glacial acetic acid	*quant. suff.*
Absolute alcohol	½ ounce.

So far, there is no particular difficulty; but we now have the question of colour sensitising to consider. We are dealing with a silver haloid, which is sensitive mainly to the dark blue about G, whereas we require a sensitiveness extending entirely through the spectrum. In its unorthochromatised condition, this collodion will give us very well the negative from which we shall prepare our yellow-printing plate, and, if a screen of methyl violet is used, it will be quite satisfactory, with one exception, to which we shall refer after. The violet screen may be prepared by making first a 1 : 300 solution of methyl violet, and adding from 40 to 50 minims of this to every ounce of plain enamel collodion.

To sensitise the plate for green and yellow, eosine (yellowish) is the most satisfactory; and the solution is prepared as follows: 4 grains of pure yellowish eosine should be added to 3 ounces

of absolute alcohol, well shaken, and allowed to stand at least three days, with constant shaking, and should then be carefully filtered. To sensitise the collodion, five per cent. of this dye solution should be added to the bromised collodion.

For use with this collodion a green screen is made, either by adding 80 minims of a 1 : 200 alcoholic solution of malachite green to every ounce of enamel collodion, or, preferably, by using half this quantity of naphthol green and naphthol yellow alcoholic solution.

The third negative, which will give us our printing plate in blue, is the most troublesome to make, for it is difficult to satisfactorily sensitise the collodion for red. Cyanine is the most satisfactory, in that clearer prints are obtained, though it is doubtful whether cærulean S could not be used with better effects, the only point being that acids set free sulphurous acid from this compound, which might naturally act prejudicially, not only on the silver bath, but also on the clearness of the resulting negative.

Cyanine may be used in exactly the same way as eosine, and, in fact, equal quantities of the two dye solutions should be mixed and added to the collodion in the proportion of five per cent. of each.

With this collodion an orange red screen should be used, which may be prepared by using about 40 minims of 1 : 500 solution of aurantia, and 40 minims of 1 : 500 solution of chrysoidine extra to the ounce of enamel collodion.

The formulæ given for these screens are but approximate, and they must really be adjusted by means of a spectroscope.

To sensitise plates coated with the above collodion, the necessary length of stay in the silver bath is nearly twice as long as for an ordinary bromo-iodised plate.

There are one or two points which require a little explanation. The first is, as to the use of acetic instead of nitric acid in the silver bath. Nitric acid immediately decomposes eosine and cyanine, and not only is considerable colour sensitiveness lost, but the plates are foggy.

The second point is as to the preparation of the yellow-plate negative. Theoretically the red and blue, assuming that we are photographing the spectrum, should be equally opaque, and the yellow only bare glass, but practically the red end may be ignored, as any failure here is compensated for by the use of a carmine ink.

That three-colour negatives can be made direct in the camera by the wet-plate process is proved, but is the game worth the candle? If we take as unity for exposure that required to make a good half-tone negative on ordinary wet collodion from a print, or, better still, a transparency made by contact printing from one of the three negatives made on gelatine plates in the ordinary way, we shall find that we have first an increase of exposure of three times in consequence of the slowness of the colour-sensitised collodion, and then an increase of about three times again for the violet screen, an increase of about thirty for the green, and 180 for the orange screen; and we are compelled to arrive at the conclusion that direct three-colour half-tone negatives on wet collodion are not practicable so far as time-saving goes, and, unless we are using extremely powerful arc lamps for illuminating our subjects, the exposures will be so unduly prolonged as to introduce the trouble of the plates partly drying.

Then, again, if the half-tone negatives are made direct, we certainly lose one very valuable aid to successful reproduction; for, if we use dry plates in the first instance, and from these negatives make transparencies, either by contact or in the camera, we may alter considerably the tonality of the results by making these transparencies harder or softer. Unless absolutely correct negatives can be guaranteed the first time, it will be more satisfactory to make our three negatives in the ordinary way, and then the half-tone negatives, than to make the latter direct in the camera, whether on dry plates or wet collodion.

For those who wish to use collodion there is no better process than that of Hübl, described by Herr Pretzl in our issue of August 28.

Memorial to Fox Talbot.—We learn that, as a memorial to this distinguished man to whom photography is so much indebted, it is proposed to restore the chancel of Lacock Church, Wiltshire. Those of our readers who attended the Bath Photographic Convention will remember one of the excursions was in this direction.

Marvellous Röntgen Work.—According to accounts received from Berlin, Herr Dormann has obtained Röntgen sciographs through plates of iron twenty-two centimetres (about nine inches) thick, and has already taken upwards of fifty of such photographs. The experiments are to be continued by Professor Seaby, of the Charlottenburg Polytechnic Academy, he having taken a great interest in them.

Hypo-phosphorescence.—This term has been devised by Professor Silvanus P. Thompson to express the production by rays of light of vibrations more rapid than their own. As an example of this newly discovered state of vibration, he found that the rays of an arc light could so act upon a piece of pine as to cause a shadow to be produced by an object placed on the other side of the wood and against a sensitive plate; but, if a thin plate of aluminium were to be substituted for the pine, there was no action upon the plate.

Testing for the Presence of Acetylene.—Professor Clowes, in a paper read at the recent British Association meeting stated that this gas could not, when in a state of purity, be readily detected by its smell, and the smell would not, in any case, furnish a means of measuring the proportion present in the air; but the detection could be easily carried out by an adaptation of his method of ascertaining the presence of fire damp and coal gas in air. A small hydrogen flame showed a pale but well-defined "cup" in air containing any proportion of acetylene lower than the lowest explosive proportion. When the hydrogen flame was exposed to air, to be tested for acetylene in a darkened space, it was at once tinged yellowish-green.

Surveying by Photography.—As the same meeting was described a method for utilising photographs taken with an ordinary camera for filling in the details of a map. Mr. John Coles pointed out that the Surveyor-General of Canada had adopted the plan, and had produced good useful work by its means. In the discussion it was, however, pointed out that the weather was so important a factor in the matter that photography could never be depended upon for surveying of the highest character, though it would be very valuable in the surveying of mountainous districts and new countries.

Amusing Queries.—An evening contemporary that has a column devoted to queries and answers often has some very amusing ones as regards photography, and we have on one or two occasions treated our readers to a sample. Here are a couple more that appeared a few days ago, which are evidently photographic, though there is nothing to indicate to the readers that they in any way relate to photography. We here give them *verbatim*. "PLATES.—What are isochromatic and orthochromatic plates?—*W. B.*" "STAINS.—Is there a way of taking out pyro and also fixing stains

on clothes?—*Stains.*" It may be presumed, as the word "pyro" is used, that this is a photographic query, though it may be doubtful, inasmuch as most photographers are more interested in the removal of stains than in fixing them upon their clothes.

Conveyance of Gas Cylinders.—The lantern season is now well upon us, and we are sorry to see at some of the railway stations the same notices with reference to the carriage of charged gas cylinders that were issued last year. How far those restrictions will be carried out this season we are at present unaware. Up to the present, on some lines at least, the report of the committee of experts appointed by the Home Office seems to have had no effect. Of course, as we have said before, the railway companies can make their own rules and regulations, and need not be influenced by the committee's report. It is to be hoped, however, that the stringent regulations still prevailing on some lines will be, to some extent at least, relaxed. If they are not, there is little doubt that cylinders will often be carried surreptitiously as personal luggage, as we know was sometimes done last season.

The Rain in September.—Those amateur photographers who put off their annual holiday till September have had good cause to regret it. September is, however, as a rule, one of the best months of the year for outdoor photography. Some of the best pictures of the late Mr. Vernon Heath were taken in that month. This year's September has been an exceptional one, as the rainfall has been more than two and a half times its average, and has been accompanied by exceptionally heavy gales and storms. In London, 5·31 in. of rain was registered, and it is not since 1875 that 5 in. has been registered at Greenwich in a September, and only five times since 1841. The total rainfall for the summer, from April to September, was, at Greenwich, 11·10 in., and of this very nearly one-half fell in the latter month.

Apropos of the rough weather of last month, the gales must have sorely tried the roofs of many photographic studios, particularly those of the old type, and developed many leaks that were but little suspected before. When one journeys to town by rail, especially from the southern and eastern suburbs, where the trains are on a level with the housetops, one cannot help noticing the number of more or less dilapidated studios perched on the tops of houses or outbuildings, erected in the days of glass positives or Daguerreotypes, and at the same time wondering how they have withstood the elements for so long a period. One would surmise that, if the district surveyors in some of these neighbourhoods were as vigilant as they are in others when a new studio is to be built, many of these "glass houses" would be condemned as being unsafe, as many undoubtedly are, in a heavy gale of wind.

Ideal Statues.—At the unveiling, at Paisley, of a statue of the famous Scottish poet Burns, Lord Rosebery, who performed the ceremony, remarked that, manifold as are the statues of Burns, of busts or statues taken from life, there is not one, nor is there even a cast, taken after death. "We have," he said, "to some extent, therefore, to idealise our statues of Burns, though not so much as in the case of the statue of Highland Mary, which was erected the other day—a graceful tribute to a charming character, but one of whom we possess no likeness whatever. Still, of Burns we have nothing but canvas, and canvas that is not wholly satisfactory." Now, to many matter-of-fact people, it seems a little irrational to erect a statue of an individual of whom no portrait or likeness whatever exists. Yet idealised statues exist almost everywhere. Probably, however, if the parents of the individuals could again visit this earth, they would fail to recognise their own children.

In reading Lord Rosebery's speech we were forcibly reminded of an anecdote that has done duty in several different forms since its birth in the Daguerreotype days. It is this: An old lady waited on the artist saying she wanted a "daggeratype" of her son taken. Upon being told to bring the son to the studio, she replied she could not, as he was dead, but she had a very good description of him in an old passport, and she supposed that would do as well. Not only are statues idealised every day, but paintings also, and very differently, by different artists. One has only to walk through our National Gallery, or any of the Continental ones, and note the scores of, say, *Madonnas and Infants*, to see how wonderfully different each artist has idealised the portraits, no two being alike. Every painter has his own ideas as to what the Madonna was, or should have been like, and paints the features accordingly; so with sculptors, they portray a bust or a statue by idealisation according to their individual conceptions.

Photographic Lens-testing at Kew.—Our readers have on a previous occasion been put in possession of the methods adopted in Kew for testing photographic lenses. Just as by sending a thermometer, or a watch, &c., any one can, after paying a small fee, receive a clear statement as to its exactitude or its variations therefrom, so can the sender of a lens be informed of all its faults and excellences. Much was expected of this new departure at the time of its introduction; but, judging by figures, very few have availed themselves of the opportunities offered. According to the Report of the Kew Committee, just published in the proceedings of the Royal Society, the year 1894 saw no more than twenty-seven lenses submitted; and last year only about half that small number, fourteen being the tabulated figures. This must be very disappointing to the introducers of the system, which involves a very considerable amount of personal attention being given to each lens examined.

Rejuvenation of Defective Crookes' Tubes.—Mr. Ralph McNeill, of New York, says: "A little point which I have found out about focussing Crookes' tubes may be of interest, as I have not seen it in print. In use, the vacuum of the tube runs up, necessitating increasing the power of the coil to get the same results, and, after this increase becomes impracticable, heating the tube is resorted to. This is apt to destroy the tube by cracking it, unless very carefully done, and, even if safely done, it soon loses its power to restore the tube. It occurred to me that the increase of vacuum was due to the absorption of gases by the platinum anode, and, knowing that the negative pole threw off gas, I reversed the polarity of the tube. After working it in that way for half an hour, the tube was restored to full power, and I have practised this process for the past two months with perfect success and without injury to the tube. After an hour's run with the X rays I reversed it as above, and it is ready for another hour's run. The coil should be cut down in power when reversed, as there is danger of disintegrating the platinum and depositing it on the glass. I cut out half the battery power. The tube-makers recommend that very high vacuum tubes be sent them to have air admitted and repumped; but my method appears preferable, and, besides, saves their charge of three dollars and the time."

Gold and Silver in Sea Water.—For many years past enthusiasts have discussed the probability of extracting in paying quantities the silver, long known to be present, from sea water. More lately gold also has been shown to be a constituent of salt water. Quite recently our contemporary, the *Chemical News*, has been reprinting in its columns a paper by Mr. A. Liversidge, M.A., read before the Royal Society of New South Wales upon this subject. He has treated it in such an exhaustive manner that it is scarcely likely to be resuscitated after the *coup-de-grace* he has, unconsciously it may be, delivered. Photographers need feel no hopes that any project can be devised that will give them either cheap silver or cheap gold. To give some idea of the amount present, we may say that Mr. Liversidge found, for example, in three samples from Southern waters, quantities ranging from half a grain to just over a grain of gold per ton. His final verdict is that "at the present day it would probably not pay to extract the gold by itself, although it might as a by-product in the manufacture of salt, bromine," &c.; rather disappointing after, in the same paragraph, reckoning up the actual amount present in the whole of the ocean. Thus, reckoning on the above basis, and the most modern calculation

as to the bulk of the ocean, he points out that there would be, in all the seas and oceans of the globe, 75,000,000,000 tons of gold!

Photography at Balmoral.—The Queen's photographer at Ballater, Mr. Mylne, who had the honour of being summoned by Her Majesty, must have had a good business line at Balmoral last week. We read that the whole of one forenoon was taken up in photographing their Imperial Majesties and the Royal guests, so that the shooting party, which was to have started in the morning, did not go out till the afternoon. One of the principal groups taken included the Queen, the Emperor and Empress of Russia, the Prince of Wales, and the Grand Duchess Olga. Another group included the Princess of Wales, the Princess Victoria, Prince and Princess Charles of Denmark, the Emperor and Empress of Russia, the Duke and Duchess of Connaught, and several other Royal personages Other groups with the same illustrious personages in different costumes were taken; also groups of the Russian household, as well as the members of the Queen's household. It is seldom that any photographer has had the honour of taking such a number of negatives of Royal personages as were taken on this occasion. One of the daily papers takes quite a third of a column in enumerating the groups taken, and the dresses worn by those who figure in them. The day before, the detachment of the Scots Greys, of which the Czar is Honorary Colonel, that formed the military escort of the Emperor and Empress, was paraded on the green at Ballater and photographed. A day or two after, the Guard of Honour (Black Watch) were also photographed, Her Majesty being desirous that both these groups should be kept as mementoes of the Czar's visit to Scotland. On the visit to Mar Lodge, while the royal carriages were passing along the avenue, and when the party was being received by their host and hostess, "animatograph" photographs were taken at the rate, so it is said, of twelve hundred in ten seconds. Altogether, there has been no lack of photography at Balmoral during the past week.

BY THE WAY.

I HAVE had another rather rambling letter from Mr. A. Robertson, in which, *inter alia*, he gets the German Emperor and the Transvaal hopelessly mixed up with amateurs, professionals, and photographic dealers. The only material point of interest that I can gather from his communication is that he has discovered that I am a "traveller for the trade, and therefore have a foot on each of the two horses, as in the circus." Passing by the entirely novel revelation to me that photographic dealers send their travellers round the country on circus horses, it may interest Mr. Robertson to know that I have not the slightest commercial interest in photography, either as dealer, professional, or "shamateur," but have written on this subject purely from the common-sense point of view.

Mr. Robertson objects to my view that there is no legal barrier to prevent dealers and so-called amateurs trespassing on the domains of the legitimate professional if they so please, and he is great on the point of giving and receiving "fair play," as well as on the importance of the "trade" combining to put a stop to the nefarious practices of which he complains. Now, the trade *has* tried to combine to prevent its members running down prices so low as to make living impossible, and I will put the matter to him in another way by asking him if it is quite in consonance with his ideas of "fair play" to go dead against the wish of his fellow professionals by offering a single cabinet for one shilling, for this is what he offers, I notice, from the business card sent to me. It rather seems to me that his idea of fair play is somewhat one-sided—he may do as he pleases, but others may not. A far more manly view of the question is taken by a correspondent in a recent JOURNAL, "One of the Poor Slaughtered Ones," who openly declares for doing as he likes and letting others do the same.

Turning to another matter alluded to in my last—the pharmaceutical chemist and his vagaries, I cordially agree with one of your correspondents, that the "silly season" has been in full swing. It is always more or less "on," but it seems to me this year it began to grow in intensity on August 14, when the Pharmaceutical Society was heard for the first time through its humble agent, "W. Hampson;" and it culminated on September 11, when the same individual so freely took the bait held out for him, for I must confess that I had a strong suspicion that my mental picture of the average "chemist" would pretty closely fit the individual who exhibited such an indignant interest in the status of the Pharmaceutical Society. It was silly in the extreme on the part of an individual member, however eminent, to exhibit so much irritation on behalf of the Society as Mr. Hampson did in his first letter; it was sillier still to so hopelessly "give himself away" as he did in his second, by descending, as he did, from the lofty pedestal first assumed to the shop floor and broom, and to the performance of other duties that form no part whatever of the business of a pharmaceutical chemist as such.

I am not at all concerned in the mere verbiage that forms the greater part of Mr. Hampson's letter on page 591, but I should like to say a word or two in reply to his allusion to the "other subjects" in the chemists' (?) "exam." In my last communication I spoke of "*quasi* botany and *materia medica*" as being the only two subjects really essential for the apprentice to specially study, since—in the old days, at least—during his seven years of service, if any good at all, he would pick up a really practical knowledge of all the operative chemistry that it was ever intended the "pharmacist" should require. In the old days—I do not know how it may be now—most of the tinctures, powders, and preparations, as well as many of the salts used in pharmacy, were made on the premises, and the careful and industrious apprentice acquired an intimate and practical acquaintance with the preparation and composition of such things that would carry him through the exam. without any further "cramming." Now that the majority of such preparations come direct from the wholesale houses, the apprentice, and after him the full-blown chemist, has to rely mainly upon a book knowledge of their composition and characters, and this, as I stated previously, is most likely "crammed" into him with other matters during the last few months of his "time." What wonder, then, that in too many cases it is nearly all forgotten twelve months after the examination is passed?

I am quite aware that practical and analytical chemistry form a part, but not a very essential part, of the modern curriculum, but there is just where the trouble comes. A youth who manages to scrape through an examination in these subjects, that might possibly "satisfy the examiners" in the third and fourth form of an ordinary science school, straightway blossoms forth into an "analytical and pharmaceutical chemist by examination," all in large letters; and mark that the "analytical" comes first, because it is what puzzles him most, and therefore it looks most important. At the next stage he proceeds to the "making of analysis" of urine—*vide* Mr. Hampson—and other matters to his own satisfaction, no doubt, but possibly not to anybody else's. An old friend of my own was really worried into his grave by one of this class, who, by the mis-manipulation of some sulphate of copper and caustic potash and subsequent prescribing, first persuaded him that he was in the last stage of diabetes, and then tried to cure what he had not got! On the whole, I should be inclined to make answer to Mr. Hampson's query as to "our" knowledge of such subjects that they are never—cannot possibly be—"thorough," more possibly *quasi*, whatever he may mean by that; but, *most* probably, in the majority of cases, "none at all."

What has Mr. Hampson added to our knowledge of the subject under discussion, and what does his championship of the Pharmaceutical Society teach us? Simply that, while the Society, as was first alleged, keeps its eyes very wide open to any little infringements of its own "exclusive" rights, it works at if it does not openly encourage its members in embarking in branches of business which are none of theirs, and with which the much-boasted "charter" has nothing to do. Worse, the only two champions it can find appear to openly justify their undertaking work which is absolutely illegal. But, if Mr. Hampson is ready to "glory in his shame," what are we to think of a "member of the medical profession" who is ready to intrust his analytical work, however simple it may be, to a druggist who fills in the remainder of his time in the manner stated? I think the

medical men of Leigh, in Lancashire, owe it to themselves individually and collectively to repudiate the insinuation.

Mr. J. Pike's championship takes a much less objectionable form, and he attacks the question from an entirely different point of view, as he speaks in favour of the chemist individually rather than of the Society. It is quite true, as he says, that the business of the chemist abounds in anomalies; but who is to blame for them? Surely no one but the chemist himself, or his Society; and, to prove this, I need go no further than one of Mr. Pike's own instances, which is so comically absurd, as an argument from *his* side, that I can scarcely help thinking he intended it for a joke. Amongst other things, he complains of the public asking "for *liquorice* powder when they mean a compound of sulphur, senna, fennel, and sugar, &c." The "&c.," he might have added, representing the liquorice. I turn up the first book of reference that comes to hand—*Gray's Supplement to the Pharmacopœia*, edited by no less an authority than Dr. Theophilus Redwood, Professor of Chemistry to the Pharmaceutical Society—and I find this mixture there described as "*Pulvis glycyrrhizæ compositus*," "*Pulvis pectoralis kurellæ*" ("compound liquorice powder"). These are the only names it bears, and I want to know what else Mr. Pike expects an innocent public to call it if they want to get it?

If the Pharmaceutical Society or chemists individually choose to name a compound after one of its ingredients, which forms only a sixth part of the whole, and which is perhaps the least active portion of the mixture, it does not seem fair that they should charge the public with introducing anomalies into their business. Who but the chemist, too, is chargeable with degrading carbonate of soda to simple "soda," dropping even the popular prefix of "washing," and bicarbonate to carbonate? Who but the *pharmaceutical*—I lay stress on the word—would think of selling or describing red oxide of iron as "*ferri carbonas*" or "carbonate of iron?" And I wonder, supposing I wanted carbonate of iron and received powdered hæmatite ore instead, whether I should have any ground of action against the "chemist" who sold it to me. Not a great while back I wanted some ferrous oxide, and went to the "chemist's" for it. I was told he had none, so I asked for "carbonate of iron," and got what I wanted; but I was surprised to find that the chemist himself thought, until he turned up his pharmacopœia, that, so far as this great and important corporation is concerned, the terms are synonymous.

But Mr. Pike's defence of the practice of chemists prescribing is a direct argument in favour of the other side. It was "Cosmos," not I, who mentioned this little weakness of the "poor chemist," and here we have its *raison-d'être;* like selling lenses, extracting teeth, making analysis, and a thousand-and-one other jobs that pertain to somebody else's business, it is avowedly to keep the money from going anywhere else, which is just what the poor chemist has all along been charged with. But even that explanation does not render an illegal action legal, and prescribing by chemists *is* illegal. It reminds me of the burglar's defence when asked what he had to say for himself: "If 'e's such a mug as to leave 'is door open all night, I should be a bigger to go past without sneaking something."

On the whole, however, Mr. Pike takes a more reasonable view of things than Mr. Hampson, and does not pretend to ignore undoubted facts. It is the high-and-mighty, omniscient side of the chemist's character that makes him such an objectionable and dangerous object, when his peculiarities are well marked, and it is not too much to say that the modern "chemist by examination" generally feels himself competent to undertake anything from dispensing to analysis or even the management of a plate factory. He is the sort of man, who, if you ask for bicarbonate of soda, could not think of serving it without labelling it "monosodic carbonate." It looks better, don't you know. That is, if he has been properly taught, but, as likely as not, he would give it you as di-sodic carbonate, as actually occurred to me, just to mention one more instance that recalls itself, and no amount of argument would convince the two learned young gentlemen of the difference between the terms "*di-acid*" and "di-sodic." A writer on the alkaline toning bath in the pages of the JOURNAL some years ago—who must, I think, have been a chemist of the pharmaceutical kind—gave his readers the valuable information that bicarbonate of soda, as compared with the ordinary carbonate, *contained twice the quantity of alkali*, and must therefore be used more sparingly.

Looking at the matter in a dispassionate manner, I don't think the Pharmaceutical Society's defenders have done it much good. Mr. Hampson has treated us to a number of mixed metaphors including that of the two horses yoked to opposite ends of the coach who "look foolish" because they accomplish so little. Following his lead, I would suggest that, when the two horses hitch themselves on to the tailboard of the pharmaceutical coach, they must both look and feel foolish at the vast amount of work they can jointly accomplish in the wrong direction.

The poor chemist has proved such an interesting subject that I have left myself no space to say a few words, as I had intended, on another topic of the day—artists or painters as Judges. I am sorry for this, because at the time I write the results of their deliberations over the exhibits in Hanover-square are not yet known, and could not therefore have in any way influenced my remarks. However, if the subject is not overdone in the interim, I will defer my views until next month. DOGBERRY.

FOREIGN NEWS AND NOTES.

Line of Sight and Facial Angle.—An interesting article on this question, by Jean Paar, is published in the *Photographische Correspondenz*. Kampfer's method of determining the facial angle is by two crossed lines, one of them in the direction of the base of the forehead and the incisor teeth, and the other from the ear passage to the lower part of the nostril. The angle formed by these crossed lines is 90° in the higher races, 65° in the lower races, and 45° in the apes. The angle exceeds 90° in the Apollo Belvidere, and in the profile of the Zeus of Otricoli it exceeds 100°. Kaempfer explains this abnormal or superhuman angle by attributing to the sculptors a desire to express the superhuman intelligence of the gods by a superhuman facial angle. On the other hand, Professor Vogel, in his *Handbook of Photography*, maintains that the lofty profile adopted by antique sculptors depends upon practical considerations. Jean Paar thinks there is some confirmation of this in the head of Hermes by Phidias. But Paar advances a theory of his own, based upon considerations of perspective. In the Apollo Belvidere the line of sight was important. The statue was intended to be placed on a moderately low pedestal, and the sculptor apparently intended that it should be viewed with the line of sight directed centrally. The larger facial angle, if intentionally designed, would then apparently give the warlike god of light an expression of higher intelligence. But art and nature seem strangely at variance, and Paar remarks that Voltaire, Neander, and many others, were object-lessons for the Darwinian theory. The facial angle in the two first-mentioned men was probably between 60° and 70°, but in the brains of both was stored up more intelligence than in many a dozen specimens of the bovine type with facial angle of 90°.

Röntgen and Lenard.—In the *Photographisches Wochenblatt*, R. Ed. Liesegang discusses the question whether the Röntgen and the cathode rays are related to each other or not. Battelli and Garbasso have come to the conclusion "that it is not logical to believe that the cathode rays, which cannot be diverted by the magnet, are different from the Röntgen rays. Real characteristic differences are wanting. The simplest conclusion is that the cathode rays do not differ from each other in their essential properties more than, for example, two flames of different colour." Röntgen, in his treatise, affirmed as an important difference that Lenard's rays were only perceptible at a few centimetres' distance from the tube, whereas his own could be observed at a distance of several metres; also that the cathode rays were subject to magnetic influence, whilst the new rays were not. Neither of these statements will hold water. Lenard has been able to observe the cathode rays at a considerable distance under favourable conditions, and Goldstein has shown that there are cathode rays that are uninfluenced by the magnet. As both do not agree in all respects, it may be read between the lines of what has been published that there may be a difference in wavelength after the manner of red and blue light. But this is incorrect, the difference being more like that between white and monochromatic light. The properties of the cathode rays indicate that we have to deal with a mixture of different sorts of rays, more or less, or not at all, influenced by the magnet, in the same way that white

light is broken up by the prism. As the blue rays are a component of white light, so the Röntgen rays form part of the cathode rays. If we make a piece of iron red hot, it emits red light only. Heat it until white-hot, and it will then emit red, green, and blue light. It is the same with a Crookes' tube, the degree of exhaustion acts similarly to the creation of light by heat. A low vacuum will permit the emission of only those rays corresponding to red light, and strongly influenced by the magnet. They contain few Röntgen rays, and penetrate the glass very badly, and for this reason Lenard had to use an aluminium window. Röntgen used a higher vacuum, and obtained the rays uninfluenced by the magnet corresponding to blue light. If we hold a blue glass in front of the red-hot iron, the latter is invisible, but if we hold it before the white-hot iron we see blue light. Röntgen similarly separates the rays which are susceptible to the magnet from those which are not by allowing them to pass through the thickness of glass. By means of a magnet a species of cathode spectrum may be obtained. In this way it may become possible to isolate a special kind of ray.

Granularity in Carbon Printing.—Besides the usual method of coating with collodion for avoidance of this trouble, Raimund Rapp, in *Die Photographie*, recommends the use of gelatine and chrome alum. A five per cent. gelatine solution is prepared by first soaking in cold water for an hour and then raising the temperature to 35° or 40° C. Into this is dropped with constant vigorous stirring sufficient of a six per cent. chrome alum solution until it thickens. For half a litre of gelatine solution about thirteen to sixteen cubic centimetres of the chrome alum solution are necessary. Now add drop by drop sufficient glacial acetic acid until the whole is again brought into a fluid state, and then filter. Before the cleaned glass plates are coated with the solution, they should be given a narrow edging. When this is dry, the plates are levelled and coated in a room free from dust. If the fault arises from too rapid drying of the tissue, it may be obviated by placing a few saucers of water in the drying room. In warm weather it is advisable to cool the water in which the prints are soaked with ice; also be careful to keep the tissue below the surface of the water.

A New Developer.—The *Photographisches Archiv* states that E. Ackermann has discovered that a strong reducing fluid, suitable for development, may be formed by heating in a closed vessel for ten hours, at 100 C., 2 grammes of sulphate of quinine, 8 grammes of powdered zinc, and 40 cubic centimetres of water.

The Fire at Montpellier.—Referring to the unfortunate destruction of the Montpellier Exhibition by fire, Mr. Léon Vidal, in *le Moniteur de la Photographie*, draws attention to the irreparable loss of valuable documents, paintings, and other works of art from such causes. It is usually said "the loss was covered by insurance," but no insurance can repair damage of this kind. Ought not photographs to be made of all precious documents, and copies deposited in various collections? It would then, at least, be possible to reproduce, in a measure, the original, should they be lost by fire or other misadventure. In France there is a Museum of Photographic Documents, which assists this end, but it is unimportant where such collections are preserved, provided proper catalogues are kept and the works are accessible to those interested in them. This is a matter requiring serious and urgent attention.

Rules for Printing.—In the *Photographische Mittheilungen*, P. Hanneke criticises the usual instructions to print until the shadows begin to bronze and the high lights are affected. It would be more correct to say that the prints should be taken from the frame when they are rather darker than required when toned; but one should be careful not to print too slowly, and to tone directly after printing, unless the combined bath is used. The frames also should not be opened in a temperature different from where the printing takes place. If the prints are printed too slowly, or if they are kept any time between printing and toning, it will be difficult to produce bluish tones, especially with albumenised paper. For blue tones on collodio-chloride paper a preliminary bath, to which ammonia is added, is frequently recommended. In this way a fine, warm blue, with a trace of purple in it, can be obtained, but the prints must be well washed before toning. Fresh paper should be printed rather deeper than old, and yellowish paper should be left longer in the fixing bath. The normal time for fixing is fifteen minutes.

A Good Cat Story.—In the *Bulletin du Photo Club de Paris* we read of the following incident at the château of Dobroslawitz. Count W—— is an enthusiastic amateur photographer, and has trained some of his servants to undertake some of the minor functions of the laboratory assistant. One of the valets was in the habit of leaving candle ends about and remnants of food. This attracted the rats from the stables, and caused much trouble and annoyance. Infallible traps were ordered from Paris, but to no purpose. Phosphorus paste and other poisons were not to be had; but a visitor, finding a stuffed cat, a former favourite of the household, he thus ingeniously defeated the wary rodents. The eyes of the cat were removed and replaced by a couple of lenses from a toy microscope. The Count's Secretary placed two small incandescent lamps behind the lenses. These were connected with a battery, and the cat, thus equipped, was placed in the laboratory near the suspected entrance of the rats. A very delicate connexion was made with the lamps, and covered with a cake made of flour, melted fat, oil, and powdered sugar. This was placed in such a manner that a rat seizing it would immediately pass the current into pussy's eyes. The Count had no faith in the arrangement, but the watchman undertook to keep an eye on the laboratory, and the first night the cat won a complete victory. The rats had scarcely touched the cake when the eyes of the cat were illuminated with a greenish light, and terrified the devastators so utterly that they fled stupefied and never returned again. An electric bell was rung at the same time as the eyes were illuminated. The watchman was immediately upon the spot, found the cake partly gone, and the eyes of the cat still glowing with their deathly light.

A ROYAL ALBUM.

We have had the opportunity of examining an album of photographs that has been presented to Her Majesty the Queen by Messrs. Johnston & Hoffman, the well-known photographers of Calcutta, who intrusted the binding and the illumination of the pages to Messrs. Marcus Ward & Co., of London and Belfast. The album contains fifty-seven 12 × 10 portraits in platinum of the ruling princes of India, taken especially for the purpose by Messrs. Johnston & Hoffman, and sixty-six smaller views in the various states, interiors of palaces, &c. The photographs are of extremely good quality, aside of the very great interest attaching to them.

The mounting, lettering, and binding are the work of Messrs. Marcus Ward & Co., who also executed the very tasteful Oriental illumination surrounding the smaller photographs. The front cover of the album is in cashmere silver *repoussé* work, the back cover being gold embroidery with a silver rim. The back of the cover is in royal blue Levant morocco. The inscription on a silver plate states that the album is presented by permission to Her Majesty. The panels of the casket in which the album is contained are in Bombay inlaid carved black wood, lined with blue silk, and the sides and front of the casket fall down, so that the album need not be taken from it when it is desired to examine it. The album is a splendid production, and reflects great credit on Messrs. Johnston & Hoffman.

CALCIUM CARBIDE AND ACETYLENE.*

This compound has created an enormous sensation in the financial world, or at least in the speculative part of it, during the last year or so. As far as its discovery in America goes it appears to have been a mere matter of chance, an invention in the literal meaning of the word. The formation of calcium carbide from carbon and lime seems to be a mere question of temperature, and to have nothing to do with electrolysis. It may be that lime and carbon do not react until the lime is fused or the carbon volatilised, and that the temperature of the electric furnace is needed to bring this result about. It is probable, however, that the very high temperature is necessary to bring about the reaction, apart altogether from getting the lime and carbon into contact. I have tried some experiments with an oxygen furnace, and have not succeeded in making calcium carbide even when I used a solvent for the lime, so that there was no doubt that it came into contact with the carbon. These experiments were not tried thoroughly enough to be conclusive, but they tend to show that an exceedingly high temperature is needed. It is hardly necessary to say that an oxygen furnace, that is to say, an injection furnace fed with an oxygen and coal-gas blowpipe, gives a pretty high temperature.

The future of calcium carbide depends very largely on its cost of manufacture. It is, of course, very absurd to take the cost of coal, lime, and energy, and, calling that the cost of the carbide, to compare the cost of a candle-power-hour with that of gas as charged to the consumer.

* From a Cantor Lecture on *Applied Electro-Chemistry*, delivered at the Society of Arts.

The prime cost of gas delivered into the "hydraulic main" would be the right thing to compare in such a case, and would tell a very different story. On the other hand, the distribution of acetylene may well be much more simple in proportion than that of coal gas. If it is to be delivered by pipes, its only advantage, as far as distribution is concerned, is that the pipes will be smaller. This would make but little difference in the total cost of distribution, as it only reduces the capital sunk in mains a little. The cost of laying them would not be very much reduced.

The first thing is to get some idea of the cost of calcium carbide. The estimates given vary enormously, as very little has been published as to actual cost of manufacture. It seems probable, however, that the cost of manufacture—that is to say, the cost of lime, coke, carbons, labour, and energy, taking everything at a farthing per kilowatt hour, will be a little over 6*l*. If water is used, the price comes out a little lower; but, as already explained, water power must not be reckoned upon too much, as rents will probably go up soon. It is best to be on the safe side, so we may perhaps take 10*l*. a ton as the final price of electrically made calcium carbide, capable of giving five cubic feet of acetylene per pound, packed and delivered on rail, after paying manufacturers' profits and all charges. This seems a low price, and it may be said that the various aluminium works have all the plant ready, and know exactly the cost of manufacture, and have reduced the price as far as it will go already. The business has really hardly commenced, however, and there is little doubt that the processes will be cheapened. At present it is the roughest and crudest method imaginable.

Let us assume the final price to be 10*l*. a ton, and see exactly what its future may be at that figure. Allowing five cubic feet of acetylene per pound, this gives, in round numbers, 18*s*. per 1000 cubic feet. Calcium carbide is not acetylene, however. Suppose the treatment with water raises the acetylene to 20*s*., and that it gives 20 times as much light as coal gas, it would then correspond with gas at 1*s*. per 1000 cubic feet. Now let us look at the price of gas. A ton of coal at, say, 10*s*., gives 10,000 cubic feet of gas, so gas should be 1*s*. per 1000 cubic feet; but the ton of coal gives 15 cwt. or so of gas coke, which is worth something, and over 100 lbs. of tar, which is valuable, and 20 gallons or so of ammonia liquor. Some of the 15 cwt. of coke is used to heat the retort benches, and labour, &c., has to be paid for, but still the actual value of gas at the hydraulic main is really only a few pence per 1000 cubic feet, and acetylene has no chance in comparison. The common practice of taking the price—generally the prime cost—of carbide of calcium, reckoning from it the price of acetylene, and comparing it with the price of delivered coal gas, is absurd. In addition, the great difference in lighting power comes in when the acetylene burner, though using little gas, is giving a very powerful light. Except in sitting-rooms, people want small lights about their houses, and they want to be able to turn them down at will.

Acetylene may be used for enriching coal gas. Whether it will pay depends very much on the local conditions. Cannel coal is usually employed when enrichment is necessary. The prime cost of gas at any works depends on the price of coal and labour, and on the selling price of coke, tar, and ammonia. The cost of scrubbing and purifying would have to be incurred in making acetylene on the large scale, and the cost of distribution by pipes and collection would be about the same in both cases. It is impossible, however, to give any answer as to whether it would pay to enrich coal gas, unless one knows the real cost price of gas in a given case. Thus, to take a rough example, suppose crude gas costs 6*d*. a thousand cubic feet, so that acetylene costs forty times as much. Adding 3 per cent. of acetylene would about double its lighting power, so that to replace 1000 cubic feet of gas we would have 500 cubic feet costing 3*d*., and 15 of acetylene costing over 3½*d*. It is, therefore, clear that it will not pay to enrich with 3 per cent. of acetylene at these prices. I have not worked out figures to find the best enrichment for each relation of values of acetylene and coal gas, for it seems clear that, unless the cost of carbide is much less, or the cost of crude gas much greater than here assumed, there is no chance of its being utilised in that way. A public company does not make improvements if it can help it, and of all public companies, gas companies, owing to their constitution and the sliding-scale arrangement, are least likely to adopt such methods as enriching gas, even with the by-products of electric lighting companies, who make carbide to get decent load factors.

In addition to this, gas is not used only for lighting. It is very largely used now for heating purposes, and the incandescent mantle has come to stay, and people with stoves and Welsbach burners would strongly object to having their gas bills doubled, and their gas contaminated with a body which necessitates their renewing all their gas fittings and removing all copper and brass taps and couplings.

It does not look, therefore, as if acetylene will compete with gas at present. It may be a different matter in other countries. In the United States, for instance, gas is generally very dear. I had charge of works in Boston some years ago, and we paid 10*s*. per 1000 for gas. One shudders to think what it must cost in outlying districts. The enormous strides made by the electric light in America is not owing to the good electrical engineers, but to the bad gas-producers. Perhaps the gas works are run by the urban authorities; this would account for anything. If sulphate of ammonia does not fetch good prices in America, and if tar distilling and the manufacture of dyes is not brought to the perfection they are in Europe, it is quite probable that acetylene has a much greater future there than over here, especially as, in proportion to the inhabitants, water power is much more plentiful, so that power prices may remain low for a very long time.

The next scheme is to deliver calcium carbide to houses, and let the consumers make their own acetylene. All that is needed is to add water. This sounds very simple. In the beginning of the century, gas was to be made on the spot in the same sort of way. All you did was to put coal in a retort and heat it, and off came the gas. Yet this was never practised, except in special cases, and gas never came into use generally until it was distributed by pipes ready for use. There are, of course, a few country houses and isolated establishments where they make a fluid they call illuminating gas. Exactly the same thing happened with the electric light. Each house was to have a gas engine and a dynamo, and generate its own power. Then the next idea was that the accumulators were to be left at the houses with the milk, and changed next day, or week, or month; but this never came into practice either. These two schemes correspond very fairly with those of distributing carbide for use in generators, and distributing liquid acetylene in bottles. The generators would always be troublesome in an ordinary house. No doubt the light would be much cheaper and better than that of gas as commonly used, but that is by no means everything. People forget that the average households are controlled by women. Women may understand people, but they are completly wanting in the faculty of understanding things, and they have the unreasoning conservatism and conventionality belonging to the undeveloped mind as seen in boys and savages. A woman hates everything new, and would never understand how to work an acetylene generator until it had been in use for generations, and it was considered part of the duty of a good housekeeper to make good acetylene, as it used to be to make good beer. Of course, even then it would be done by rule of thumb. There is more than this. The first thing a woman asks when she sees anything new, be it a mousetrap or a telephone, is, "Will it explode?" Now, no one can say on his honour that an acetylene generator won't explode. He does not think it will, in fact he feels sure it won't, and he sincerely hopes it won't, but an explosion might possibly occur. This settles the matter. The only thing to be done would be to utilise a woman's instinctive hero worship and belief in authority, and to arrange that acetylene generators should be recommended by her clergyman or doctor. I say her doctor advisedly, as she does not believe in other women's doctors.

The plan of distributing liquid acetylene in iron bottles sounds more promising, as very little goes a long way, and the bottles could be connected to the house service by the acetylene company without the women of the house having anything to do with the matter. Acetylene is given off on the addition of water to the carbide, at enough pressure to liquefy in a cold bottle at once; and it might be purified at the same time. It must be remembered, however, that the comparison must be made as to cost, not with gas burned in the ordinary bat's-wing burner, which is generally not even good of its kind, but with the incandescent mantle. If any one is going to improve his lighting, he will not take up acetylene, as against the incandescent burner, unless it is better. Acetylene gives, for a cubic foot, about three times the light of the Auer burner; so that, at 20*s*. per 1000 cubic feet, it corresponds to gas at 6*s*. 9*d*. Gas seldom costs 6*s*. 9*d*. per 1000. Besides, it is easier to put in the Welsbach burners; but, if a considerable alteration is to be made, the electric light may be preferred.

All the same, there is a very large opening for acetylene, apart from competition with coal gas. For country houses, and in carriages, omnibuses, trains, and on board ship, it ought to have its own way. One of the chief things wanted is a good burner that will not give smuts under any conditions.

A good portable acetylene lamp is also much needed. If the lamp generates its own acetylene, there is the difficulty of having it attended to properly, at least by maid-servants. Even paraffin lamps are seldom in good order where there are no men servants, and the old colza-oil lamps never were. There are other difficulties, however. The action of the carbide on the water is so energetic that, each time they touch, too much acetylene is given off, and some sort of gas-holder is needed. I have tried mixing alcohol with the water to reduce the vigour of the action, and it works fairly well. I have lately found that this plan has been already fully worked out. Another difficulty is that the water gives off vapour which generates acetylene, so that, when the lamp is out of use, acetylene is being generated slowly. This means that the lamp will smell, and the smell of acetylene is not pleasant.

Small bottles of liquid acetylene for portable lamps should be no more difficult to deal with than mineral-water siphons; and a small steel-tube bottle would run a light and portable ten-candle-power lamp for a long time. The want of portability is the great drawback to gas. The electric light is a little better, but not much. The result is that candles are still used. Acetylene lamps would not ruin the carpets or cement the piano keys together.

Too much has been generally said about the poisonous nature of acetylene. Experiments show that it is not at all a serious poison, and its smell is a great safeguard. It uses so little air in burning that, on the whole, it would be a very much more healthy illuminant than gas, oil, or candles, especially if it contains no sulphur. Healthy breathing is not generally sufficiently appreciated yet. Many people still sit in close rooms and sleep with their windows shut, and the smaller air-consump-

tion of acetylene would not really appeal to them very much. Besides, according to experiments recently made on polluted air, the evils of vitiated atmosphere have been greatly exaggerated. Though acetylene, like carbon disulphide, is an endothermic compound, it is not easily exploded. Fulminate of silver only fires it locally. The explosion does not spread. Carbon disulphide explodes under curious conditions. If some is put in a bulb, and an air-pump connected and used, it will go off. I do not know if acetylene has any analogous properties.

Calcium carbide may come to be used in the manufacture of alcohol, benzine, and other organic products; but it is too soon to prophesy its future in these directions. A great deal must depend on its price, and one of the chief items is the cost of electrical power. It is to be hoped that it will soon be made by non-electrical methods, and its price may then be reduced considerably. JAMES SWINBURN.

THE ACETYLENE LIGHT FOR PORTRAITURE, &c.

THE illustration shows Messrs. Thorne & Hoddle's method of utilising generated acetylene for studio purposes, or for use in taking drawing-room or ball room portraits. Inside the reflector are twelve 60 candle-



power burners. The method of generating and using acetylene has lately been described several times in our pages. It is only necessary for us here to remark that the light is admirably suited for portraiture.

ONE WORD MORE ON PHOTOGRAPHY AND ART.

[Edinburgh Photographic Society.]

THERE was recently read before this Society an exceptionally interesting paper by the Professor of Fine Art on the question whether photography was capable of being made to produce artistic results. The view taken by the lecturer was not the one which commends itself to the vanity of photographers. We do not like to think that it is impossible, in the nature of the case, that our finest prints should have any artistic value. Most of us perhaps hope, every time we take off the cap, that this time we are for ever to disprove such contentions; and, if after development and printing we are willing to admit that the print does not altogether come up to our expectations—that we have missed the simplicity and richness of effect that we aimed at, and that the question about photography and art has not yet, therefore, been finally disposed of—let us hope that our opponents, instead of using this admission as a final argument against us, will acknowledge that our modesty deserves encouragement; for, indeed, photographers need all the encouragement they can get. Our opponents' view is not always expressed so courteously, or from so full a knowledge of the subjects involved, as in Professor Baldwin Brown's lecture. We are used to being dismissed in a much more summary manner. We mean no harm to anybody; we pretend no rivalry with painters, etchers, or draughtsmen; but the moment we are caught trying, in our own humble way, to make pictures, we are told to get out of this. We have been angling, it seems, in preserved waters, and the water bailiff counts it an aggravation, rather than an extenuation, of our offence that, as he would persuade us, there is no hook at the end of our line. Our business, we are told, is not with pictures at all; we are to confine ourselves to making strictly mechanical diagrams of things or of bits of things, to aid the painter in his picture-making. In other words, the painter is to have all the fishing to himself; but he agreeably suggests that there can be no objection to our digging for worms; and, that we may have an irresistible motive to this enticing pursuit, he adds that the worms, when found, will be "of interest and value" to him.

At present, however, we have to consider a statement of the view that photography cannot be a vehicle of artistic expression which is not a mere unconsidered prejudice thrown at our heads, but is the outcome of a very full examination of the whole question. Even if we feel that we need not commit ourselves to Professor Baldwin Brown's conclusion, we appreciate the compliment he has paid us in giving the claims of photography such careful consideration; and, as it is not every day that we get one who can so justly claim an expert's right to speak on artistic matters to climb our stairs and address us on such subjects as this, we must examine carefully the exact position taken up, and particularly the very careful distinction the lecturer made between the sense of the words "beautiful" and "artistic." "Artistic" was taken as implying something more than merely beautiful. And I think it may be admitted that, while the distinction is a sound and necessary one, it is one that the great majority of photographers practically overlook. Even of those who devote themselves to what we roughly call artistic photography, there are very few who even aim at more than what Professor Baldwin Brown would call beautiful rather than artistic results. In the following enumeration of the four special qualities that were put forward as necessary in a work of art, it may be noted that the first two are, almost beyond dispute, within the reach of photographers. It was in respect possibly of the third, and certainly of the fourth, that the lecturer held that the very conditions under which we as photographers work preclude us from gaining results that can be called, in the technical and restricted sense, artistic. The four qualities were:—

1. A harmonious general impression of colour and light, and shade, and form, gained by a careful subordination of details to general effect.

2. This general effect must be dominated by a single idea, to convey to our apprehensions some artistic statement, and in order that it may do so there will need to be emphasis and accent in the piece, as well as breadth and harmony.

3. This statement must be a personal one. We must feel the artistic individuality as the influence which binds together the elements of the scene and makes the whole intelligible to us as a unity. On this style depends.

4. This personality must be expressed in the whole outward execution of the piece. The work is the artist's composition; let it be also in his handwriting.

Let us assume it to be conceded that, within certain limits of which the photographer is fully conscious, he can secure, first, the harmonious general impression; and, second, what is perhaps implied in the first, the subordination of the whole to one dominating pictorial idea. This brings us to the third point—the personal element, the sense of an individuality behind the work, the feeling a good picture gives us that an artistically sensitive mind has looked on or imagined the scene before us, and, experiencing some thrill of beauty in it, has taken it up, purged it of all that was irrelevant to the particular aspect that charmed, and presented the remainder in such a pointed and telling way, with all necessary modifications and accentuations, as to express in the clearest and straightest terms just the aspect which awoke the original sentiment in the mind of the artist. Those of us who aim at pictorial photography will, I think, recognise in this process of remodelling, and eliminating, and emphasising, the work they find themselves engaged in when they are preparing their subject, and also at the later stages of developing and printing. We form in our minds some tolerably distinct idea of the effect we want to produce. Then, looking to what is before the camera, we find this, that, and the other object superfluous, and therefore a blemish. By the sweat of our brow, therefore, we remove them. This fabric is too obtrusive in pattern or texture; it must either be replaced or softened by adjustment of focus. This line is ugly or uninteresting; we must rearrange, or merge it, by a variation of light, into the background. All these operations, as well as such processes as local restraint or acceleration in development, screening during printing, and many other methods in daily use, are resorted to with the direct purpose of removing obstacles to a straightforward expression of a strictly personal idea. Even in landscape work, similar means are used to gain adequate self-expression. I am talking, of course, of genuine pictorial landscape, not of the topographical views in the stationers' windows. If we cannot move about the features of the face of nature at our will, we can do a good deal to control their relative value and position on the plate by carefully choosing the one out of an infinite number of possible points of view which seems best to express the sentiment we desire to convey. Then we have to consider the question of lighting; in what position must the sun be to illuminate the scene in just the way that suits our purpose? And in conjunction with lighting there is the condition of the atmosphere; to what extent will a slight haze or vapour help us, or, in some cases, interfere with us in getting the effect we want—in securing breadth by the loss of impertinent local detail, and gradation from the strongest touches in the foreground to the delicate gauzelike tones in the distance. Thus, by observing, planning, and waiting, we often get, if we as often fail to get, just that combination of conditions which enables us to secure the aspect we had conceived, and the resulting print is, in a real and not overstrained sense, a personal statement. The picture will be an individual one, showing what those qualities were which we desired to reproduce, and so revealing something of our personal bias and predilections. Another man would have aimed at a different effect, would have chosen a different point of view, a

different light, a different state of the atmosphere; would have included a larger or a less angle, have insisted on a sharper or a more diffused focus; and, in developing and printing, he would have shown that our impression of the scene was not his one, and that what to us were the essential and characteristic features of the piece were to him superfluous details to be modified or suppressed. While, therefore, we do not overlook the obvious limitations under which photographers work, as compared with painters, nor claim that a photograph can be an individual expression of feeling in the same degree that a painting can, I think we are fully entitled to claim, what is enough for our purpose, that it is capable of recording, and even that it does inevitably record, the feeling, or the absence of feeling, of the individual who produced it.

Before going on to consider what was given as the fourth essential quality in a work of art, it is worth while noticing that even the art of painting existed practically without it up till two or three hundred years ago. Before that time painters did not express their individuality in the *outward execution* of their work in the same full sense in which Rembrandt and Velazquez did, or in which Mr. Whistler, for instance, does in our own day. Following Professor Baldwin Brown's comparison of this expression of self in technique to handwriting, we might almost say that in the early history of painting the ideal was that of copperplate. Only comparatively recently has the value of characteristic personal handwriting been recognised. You do not find among the early painters that emotional variety of surface, that individually expressive touch, that suggestive brush work, which is so essential an element in the best modern art. If the surface is not actually uniform in texture, such variety as there was was due rather to the exigencies of following the various textures in the subject than to the differences of manner and degree in which the constituent parts of the subject found a response in the imagination of the painter, in their relation to the whole effect. In putting together these notes, I happened to have before me reproductions of two portraits which illustrate this difference of method. One was Holbein's portrait of the Duke of Norfolk (the original of which is, I think, in Hampton Court); the other was the noble *Philip IV.*, in the National Gallery, in London, by Velazquez. In the first, the satin sleeves, the velvet cloak, the ermine cape, are all faithfully elaborated, and there is not a touch of the brush that is not imitative and minutely descriptive of these various surfaces. In the other portrait there is no attempt to give information as to the materials in which Philip of Spain was dressed. All the beauty and dignity of rich, quiet costume is there, but not such an inventory of fabrics as would enable you to order a duplicate suit of your tailor. In each of the two portraits there is a chain round the neck of the subject. Holbein gives you every detail of the goldsmith's work. You can read the same motto printed on at least eight of the circular panels which form the alternate links. Velasquez, on the other hand, merely shows you the handsome effect of a chain, its value as decoration; and as a painter, concerned only with beauty, he had no further business with it. The artist has to show us, not indisputable facts as to the construction of things, but only a beautiful aspect of things. And yet it would be obviously absurd to say that, because painters before a certain period had not arrived at the expressive or interpretative, and not merely realistic or imitative, technique which Rembrandt and Velazquez introduced, therefore their work was interesting and even beautiful, but not artistic.

While, however, we feel that we must admit as works of art, because we have felt their charm, pictures which are not distinguished by any very individual character in the outward execution, it has to be admitted that this quality of expressiveness in the technique is nowadays an indispensable element in painting; and, though we need not admit that the absence of it in photography must necessarily disqualify photography as a possible means of getting artistic results, it is, nevertheless, an interesting question whether or not this quality is within the reach of photographers. We know what the painters' answer usually is; and we should certainly expect their judgment to be a correct one, unless we can show that there is any reason, in the nature of the case, why they should be apt to be misled into a mistaken opinion. But there is, I think, one circumstance which has almost inevitably the effect of making painters jump to a wrong conclusion. I mean the fact that painting is a very much more pliable medium for the expression of ideas than photography at present is, or probably ever can be. The painter cannot help being struck with the *comparative* inflexibility of photography, and slips too readily into the assumption that it is an *absolute* inflexibility. In looking at a photograph, even if it happens to be one of pictorial intention (and I do not think, by the bye, that painters are much in the way of seeing the best photographs), the painter probably notices lines he would have altered, values he would have readjusted, and so on. To his brush these would have been matters easily controlled up to the last moment; but, photography being, as he assumes, at best a mechanical rendering of a well-arranged subject, he goes off with the reflection that no such control is possible to the camera. This is just where he falls into the mistake. We have not, it is true, the absolute power of reconstruction, of suppression, of elaboration that the painter has. But to admit this is a vastly different thing from confessing that we have no means of showing how our subject appeals to us in the way in which we put it on the plate and on the print. It is as if a violinist were to finger a piano, and, finding that he could not, for instance, sustain a single tone with expressive variations of crescendo and diminuendo, as he can on the violin, thereby producing some of his most beautiful and artistic effects, were to conclude that the piano is a purely mechanical instrument, incapable of expressing any personal sentiment. But every instrument, and every art, has its own technique; and, to competently criticise an art, you must have learned something of its particular technique, which is, as it were, the language in which it speaks to you. No man can have any intimate appreciation of modern painting who has not at least some general idea of how the colour is laid on; and, to judge even our humbler art, some education is necessary in the methods by which effects are produced. The trained violinist may quite well be but an indifferent judge of piano playing. He may be listening for effects and qualities which are quite foreign to the genius of that instrument, and overlooking others that are characteristic and vital. Similarly, the painter erre in condemning photographs for not exhibiting the qualities that he is accustomed to look for in a painting, and his eye is not educated to recognise the special qualities by which individuality is expressed in a photograph.

It is, of course, unnecessary, in speaking to photographers, to go over the means at our disposal of expressing our personal apprehension of our subject—those methods and devices, I mean, often used as it were unconsciously, which convey to the sensitive critic not only what it was in nature that we felt, but also to some extent how we felt it. Nor do I think that artists, whether in painting or in photography, should be too conscious of their methods or too analytical of the means by which they have gained effects. I sometimes wonder whether Velazquez, for instance, was aware of the extent to which his splendid artistic vision overlooked what was superfluous and irrelevant. Did he not perhaps believe that he painted what was before him, and paint it in the best way he knew, without too deliberate a choice of methods, or consciousness of glazes, scumbles, and "underneaths?" So I think we shall be wise if, finding, every man for himself, old and new uses for the tools and materials with which we work, we do not talk about them too much, or crystallise them into conscious tricks and processes, but gain such a familiarity with them that in our practical work the best way of doing a thing comes ready to our hand. But that there is, within certain daily expanding limits, an amount of latitude that allows an artist to declare himself, should be obvious to any one who places the work of, say, Mr. Crooke or Mr. Craig Annan, alongside of that of the purely commercial photographer, who merely provides good likenesses and sometimes even has respect to the laws, if not to the spirit, of composition. Without, therefore, attempting to detail the various technical means employed to gain artistic, instead of purely realistic, results, without setting forth the ways in which development of the negative can be intelligently controlled and the print made to yield carefully considered effects, and without taking up the thorny questions of retouching and combination-printing, we may, I think, confidently press the question whether the fine work of men such as those I have named does not show an *artistic technique* which the other lacks, and whether, apart from the superiority in posing and lighting, there is not what may almost be called a difference in texture, a quality which even the eye that has not been trained to understand the methods of photography cannot but recognise as indicating the obedience of tools and materials to the thought of the artist. The fact that on the one side the work has charm and pictorial interest, and suggests inevitably an artistic mind behind it, and that on the other the work is bald and lifeless, implies a difference in degree of expressiveness; and, where there are degrees of expressiveness, there art finds, and must find, an opportunity. To state the argument by an extremely modest analogy, a man's handwriting expresses his individuality in a very high degree; every letter, every dot and stroke, every curtailment, and every flourish, reveal something of the character of the man who wrote them. In comparison with handwriting, printing may seem a mere mechanical process; and, in a sense, so it is. But has not printing its own expressiveness? Open any book, and the page will tell you whether the printer was an artist or not. And in the same way, though in a greater degree, photography, though it cannot pretend to the nicety and suppleness of painting as a medium of artistic feeling, is yet a combination of processes which may be used handsomely or meanly, and which may be made to give results as widely apart as a cheap advertisement is from a fine title-page.

I hope I may have said enough to achieve my object, that is, to start some discussion on the general question. At the same time, the best refutation of the view that art can have no place in photography must come from the studio and the dark room rather than from the lecture-hall; and I feel sure that no one will be more pleased if we should be stimulated to gain in our work something more of the flexibility, the simplicity, the emphasis, and the reticence of great art, than our late lecturer.

JOHN WARRACK, JUN.

THE CAPABILITIES OF THE THREE-COLOUR PROCESS FROM A COMMERCIAL POINT OF VIEW.

IT is only necessary to go back a few years, to the time when half-tone engraving first become general, says Mr. M. Wolfe in the *Practical*

Process Worker, to see the rapid strides that pictorial illustrations have taken, not only in the current literature of the day, but in everything of an advertising nature. Merchants and business people of every description recognise in good pictures of the articles they have for sale the best means for selling them. How quickly the old woodcut illustrations gave way to the true half-tone, until at the present time there is no magazine but what has its quota of fine half-tone illustrations; there is scarcely a catalogue but what has its principal wares pictured in half-tone.

As it was true of the advancement of half-tone illustrations, so it will be true of the new claimant to public favour, the new three-colour process. I have every reason to believe the three-colour process will have the same rapid advancement as the half-tone. What more natural to please the eye than an illustration in colour! If the half-tone as a true representative of the subject in black and white is so far ahead as to displace wood-engraving, what may be said of the same subject in its true colour? The three-colour process is yet in its infancy, but already it is making rapid advancement in public favour. In the reproduction of paintings, water-colour sketches, it has no equal in its fidelity to the originals, while its value as an illustrator of all articles in colour that are of a commercial value will soon be unquestioned, and will be as far ahead of the half-tone process as the half-tone was of the old methods.

The time is not far ahead when every photo-engraver of any standing will be compelled to adopt it. There is money to be made at it if rightly undertaken; the chief obstacle in the adoption of the process is the amount of work and care that is necessary to make a success, the adoption of dry plates and dry-plate methods to secure the first or orthochromatic effects; the preparing of the orthochromatic plates and the making of the colour filters. It is absolutely necessary that the engraver adopting the process understands the above thoroughly; *but it can be done*, it only wants *vim*. A word to the wise, etc.

As to the character of the work to be done, it is as varied as there are articles for sale. Take, for instance, fancy covers for catalogues, samples of rugs, silks, lamps, lamp shades, fancy upholstered furniture, fancy clocks, vases, carpets, oilcloths, and a great many things too numerous to mention. The manufacturer or dealer understands the value of good and attractive pictures of his wares, and to be rightly represented it must be in colours, and he is willing to pay a price accordingly, for the very good reason that it will well repay him for doing so.

The reproduction of paintings, water-colour sketches, and even photographs in colours for books and pamphlets, in addition to the above, should make a valuable source of revenue to the photo-engraver.

BALANCE-SHEET OF THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM, LEEDS MEETING, 1896.

Dr.	£	s.	d.
To Hire of Room for Council Meetings (4)	1	2	0
Donation: "Traill Taylor" Fund	21	0	0
Badges: Presidents (8) and Members	12	5	7
Exhibition Expenses	34	19	6
Printing Expenses	21	7	6
Local Subscription Refunded	0	5	0
Postage, Parcels, Petty Cash, &c.	7	5	10
Balance	61	13	9
	£159	19	2

Cr.	£	s.	d.
By Balance, 1895 account	27	9	0
Exhibition Receipts	11	14	1
Advertisement Receipts	32	12	6
Contribution from Local Committee	11	6	6
Refunded for Carriage	0	12	1
Subscriptions (305)	76	5	0
	£159	19	2

	£	s.	d.
By Balance	61	13	9
Invested in Post Office Savings Bank in names of S. B. Webber and R. P. Drage, as Trustees ...	100	0	0
Total Convention Funds	£161	13	9

Audited and found correct, THOS. FALL.
JOHN HOWSON.
Sept. 22, 1896. R. P. DRAGE, *Hon. Sec.*

The above balance-sheet has been submitted to and passed by the Council of the Convention.

NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

ANNUAL MEETING.

THE Annual Meeting of the Association was held at Anderton's Hotel, Fleet-street, on Monday, September 28, Mr. W. Barry (Hull), the President, in the chair.

There were present, amongst others, Messrs. Adamson (London and Glasgow), Bromwich, Hon. Secretary (Kidderminster), Boak (Driffield), Eddison (Leeds), Fall (London), Freke (Cardiff), Illingworth (Halifax), Simpson (Grantham), Weston (London), Whaley (Doncaster), Whitlock (Birmingham), Whorwell (Dover), and D. J. O'Neill, Secretary.

The members and representatives of the photographic press dined together in the evening at Anderton's Hotel.

Apologies for non-attendance had been received from several members, and some resignations had been received since the last meeting at Leeds (Convention week), accompanying which were various letters expressing sympathy with the objects of the Association and regret that, by reason of the small support and scanty membership on the part of the profession, the Council had been unable to do as much for the general welfare as they had desired.

With reference to the suggestion on the agenda, as to the "Association being conducted on social lines," a full and lengthy discussion took place.

It was explained by the Chairman that a similar proposition had been made before, duly notified to the members, and fully discussed on Tuesday, July 14, 1896, at the meeting at Leeds. It was then resolved—"That this Association has done good service to the professional photographers, and it is now advised to continue it in the same purpose and use, with an increase of the social element."

It was now resolved that this Association be conducted on the same lines as hitherto, and that the next summer meeting be held at Worcester early in June, ladies being specially invited. The Secretary reported cash balance in hand, and submitted an analysis of the attendance at all meetings since the formation of the Association: London, November 9, giving an average of nineteen for the five meetings on that date, while the other nine meetings at other dates, held in Manchester, Leeds, Birmingham, Sheffield, and the Matlock Summer Excursion, showed an average of fourteen.

A statement having appeared in the *Photographic Review* that this Association had received its deathblow at Leeds (Convention week), the Secretary reported that he had refuted that statement in a letter to that magazine, which was duly inserted. Copies of same letter had been inserted in the leading photographic papers, and a copy sent to each member. The next annual meeting is to be held on opening day of the Royal Photographic Society's Exhibition, in London, September, 1897. Respecting the Photographic "Convention" Meeting, 1897, it was left to individual members to make their own arrangements, and not to issue any circular as from the N.A.P.P.

The Secretary was instructed to forward a vote of sympathy to Mr. C. E. Corke, of Sevenoaks, with reference to his recent treatment by the *Builder*, and to assure him that, if any further action be taken by him in this case, this Association will be pleased to further support him by resolution.

Our Editorial Table.

SPECIMENS OF PHOTO-MECHANICAL PRINTING.

London and Derby: Bemrose & Sons.

MESSRS. BEMROSE & SONS send us a book containing several specimens of photo-mechanical printing by a variety of processes. Photo-chromotypy, half-tone, photo-zincography, collotypes on art paper, enamel paper, cartridge and other surfaces, smooth and rough, are the processes selected for illustration, and the specimens throughout are extremely beautiful in execution. Even as specimens, we have seldom seen better examples of photo-mechanical printing.

CATALOGUES RECEIVED.

Thorn & Hoddle, 164 and 169, Camberwell New-road, S.E.

MESSRS. THORN & HODDLE'S little catalogue sets forth illustrated particulars of acetylene generators for enlarging, portrait, and domestic lighting purposes. The system employed for portraiture is shown by means of an illustration in another column. The catalogue should be found useful for reference by those adopting acetylene.

Newman & Guardia, 92, Shaftesbury-avenue.

A POCKET-BOOK of some thirty-two pages gives instructions for working the "N. & G." cameras and other photographic instruments. It is reprinted from the firm's complete catalogue.

News and Notes.

THE British Photo-print Company, of Montpelier-road, Twickenham, have purchased the business lately carried on by the Richmond College Company.

MESSRS. DAWBARN & WARD write: "It may interest your readers to know that Her Majesty the Queen has been pleased to accept a copy of *Shakespeare's Town and Times*, of which you kindly gave a review on August 7."

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, October 13, at the Gallery, 5A, Pall Mall East, at 8 p.m. The President (Captain W. de W. Abney, C.B.) will deliver his annual address. Presentation of the medals.

THE Hackney Photographic Society's Annual Exhibition has been fixed for November 17, 18, 19, and 20 next, at the Morley Hall, Hackney. Judges to be Messrs. F. Hollyer, F. C. Lambert, and E. J. Wall; Hanging Judge, Mr. A. Mackie. Entry forms will be ready next week.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, October 14. Mr. C. Hoddle will give a demonstration of *Acetylene Gas for Ordinary Use and Lantern Projection*. Members will have an opportunity of trying their new slides.

EDDISON, LIMITED.—This Company held its First General Annual Meeting at its registered office, 1, Commercial-street, Leeds, on Saturday, October 3, under the presidency of the Managing Director. The Auditor submitted his report, and the Chairman expressed his satisfaction at the results of their first year's trading (as shown in the accounts, which had been forwarded to each shareholder), and his confident hope of still better results in the future. A dividend of ten per cent. per annum was declared on all fully paid-up shares, and a substantial reserve fund established.

OXFORD CAMERA CLUB.—The first meeting of the winter session will be held on Monday, October 12, at 8 p.m., in the University Museum. The American set of lantern slides, from the Royal Photographic Society, will be exhibited. Members are reminded that this day, October 12, is the last day for sending in pictures for competition for the Exhibition. It is hoped that all members will do their best to make the Exhibition a success. As the programme for the winter is now under consideration, the Secretaries will be glad to receive from members, as soon as possible, offers of papers, demonstrations, or lantern exhibitions, with a note of the time most convenient to them.

MR. F. J. MOULT writes: "Owing to the great increase in my business during the last two years, and the necessity for assistance in the management, I have taken into partnership my brother, Mr. George E. Moult. The title of the new firm will be Moult Bros. We have taken on a lease the premises situated at No. 141, Oxford-street (lately occupied by Messrs. Perken, Son, & Rayment), which we have styled 'The West-end Photographic Stores.' A great variety of photographic apparatus, chemicals, materials, &c., will be kept in stock. Especial attention will be given to the department devoted to the developing, printing, and enlarging of amateurs' negatives. A dark room, absolutely free of charge, will be reserved for the use of amateurs wishing to change plates, films, &c., and all possible help and instruction in developing and printing will be given free to purchasers of apparatus."

PRINTING UNDER DEEP GREEN GLASS.—At a meeting of the Calcutta Microscopical Society lately, the Hon. Secretary (Mr. W. J. Simmons) showed some prints of photo-micrographs he had made on ordinary albumenised paper under a deep green glass shade. The prints were toned and fixed in the usual baths, and, as regards the paper and chemicals used, there was nothing out of the ordinary; but Mr. Simmons invited attention to the brilliant blackness of the tone of the prints. This he attributed to the green glass shade under which they were printed, whereas, under ordinary white glass, the tone, he said, would have been of the ordinary purple-brown character. His conclusion may be accepted if it is meant that the green light filter he used admitted of better gradations in the tone of the prints; indeed, without some such filter, a large proportion of the tones would probably have been lost; but the colour of the prints is most likely due to the amount of forcing they got in the toning bath. I would, however, recommend Mr. Simmons' plan to those who sigh for exquisitely graded prints full of delicate detail.—*Journal of the Photographic Society of India.*

THE AFFILIATION OF PHOTOGRAPHIC SOCIETIES.—The first of the series of six lectures on popular phases of photography, organized by the above, was delivered by Mr. John A. Hodges on Monday, October 5, on the subject of *Lantern-slide Making*, at 12, Hanover-square, Mr. W. Thomas (Chairman of the Affiliation) presiding. The audience, an appreciative, if not a very numerous, one, was kept fully interested during the delivery of the lecture by a number of slides carefully selected and prepared to demonstrate the different points treated of by Mr. Hodges, and comprised comparative specimens made by the collodion and gelatine processes, others showing the advantages in certain cases of printing-in clouds, the proper selection of colour, and the vital importance of shape of mask. The merits and demerits of contact printing and of reduction in the camera, according to circumstances, were fully gone into by the lecturer with the help of examples, and an exhaustive paper on the subject brought to a close with a criticism of a few slides on the screen, with the idea of showing what to leave out, and what to introduce, and generally where they were open to improvement.

LEWISHAM CAMERA CLUB AND EXHIBITION.—This Club, which numbers about seventy members, held an Exhibition of members' work last week, in which the pictures were supplemented by a very fine show of old apparatus and photographs, which included the original camera used by the late Walter B. Woodbury for balloon photography, an old camera for use with a non-achromatic lens, with a focussing scale on the top for the difference between the visual and chemical foci, and some paper negatives by the late J. G. Tunny, of Edinburgh, which showed that even in those days they knew not only how to make good negatives, but also artistic pictures. Here, too, were a turn-table for cameras made by George Jack in 1854, Johnson's pantoscopic camera, early Daguerreotypes, and pinhole negatives. All these things were lent by Mr. A. L. Henderson, who also showed models of his original plate-coating and emulsion-making things, and some fine enamels by his process. Amongst the pictures were some fine examples of commercial photography by Bedford Lemere, and amongst the members the most noticeable results were by Messrs. T. P. Rogers, H. M. C. Sprunt, Davidson, C. J. Lambert, Churchill, and Eastwood.

PHOTOGRAPHING THE CZAR AT BALMORAL. — A considerable portion of Tuesday, September 29, was taken up by photographing the Imperial and Royal company then at Balmoral Castle. This task was intrusted by the Queen to Mr. R. Milne, Ballater, and he succeeded in taking fourteen different pictures of the Royal personages at the memorable gathering. The Emperor was photographed first in his full-dress uniform as Colonel of the Scots Greys, wearing the ribbon and star of the Garter, next in the undress uniform of the regiment, and then in the uniform of a Russian regiment. The scene was the garden terrace, the background being the ivied wall of the balustrade. In the brilliant scarlet uniform of the Scots Greys, with the imposing bearskin, His Majesty presented a fine soldierly appearance. The Duke of Connaught, after having been photographed alone in undress uniform, was next taken as Colonel of the Scots Guards, and along with the Emperor. Perhaps the most interesting group of the day was that comprising four generations of the two Royal houses so closely related to each other. It consisted of the Queen, the Emperor and Empress, the Prince of Wales (in Highland costume), and the infant Grand Duchess Olga. A most effective picture was obtained in the corridor which leads from the main entrance to the ballroom. Another very fine group was composed of the Emperor and Empress, the Princess of Wales, Prince and Princess Charles of Denmark, Princess Victoria of Wales, Princess Victoria of Schleswig-Holstein, the Duke and Duchess of Connaught, and Princess Margaret and Princess Patricia of Connaught. Likenesses were also taken of the Empress's Cossack attendants in resplendent livery, and of the members of the Royal households. Possibly on no previous occasion has such a gathering of Royalty residing under the same roof been placed before the camera.

WEST SURREY PHOTOGRAPHIC SOCIETY.—Mr. C. E. White, the Hon. Secretary of the West Surrey Photographic Society, has a nice turn for alliteration. The Society's session opened at the Felix Institute, Lavender Hill, on Thursday evening, October 1, and the attractions, as set forth by Mr. White, consisted of cake, coffee, and conversation. These there were, and a great deal more that was equally enjoyable. The club-rooms were filled by members and their friends, including the President (Mr. George H. James), Mr. J. T. Price (Vice-President), Messrs. J. Agars, W. J. Channon, A. W. Curtiss, E. Pointon (members of the Committee), Mr. G. Bottle (Assistant Secretary), and the Hon. Secretary and Treasurer (Mr. C. E. White). The photographic work done by the Club is of a high order. One of the members, Mr. P. Martin, has just been awarded a medal by the Royal Photographic Society for a series of lantern slides, which depict night scenes in London. Other members are exhibitors at the chief galleries. A number of artistic pictures were on view last evening. A nice musical programme was carried out as follows:—Pianoforte solo, "Festival March," Mrs. Morgan; song, "Only once more," Mr. F. T. White; pianoforte solo, "Tambourion et Trompette," Mrs. Morgan; pianoforte duet, "Je suis pret." Miss and Mr. C. Halenan; song, "I'll sing thee songs of Araby," Mr. Smith; duet, "Reminiscences of Ireland," Messrs. Smith (brothers); song, "Come into the garden, Maud," Mr. T. White; pianoforte solo, "Marche des Troubadours," Mrs. Halenan; pianoforte duet, "La Reine," Mrs. and Miss Halenan; song, "Our Bazaar," Mr. E. J. Smith; pianoforte solo, "Grand Battle March," Miss Halenan; waltz, "Battle of Flowers," Mrs. Halenan. With a view to the encouragement of applied photography among its members, the Society is offering a prize of two guineas for a design with which to embellish the cover of its prospectus. An instructive programme has been arranged for the ensuing session. The social functions of the Society, however, have not been overlooked; one evening is to be devoted to "tea, talk, and tobacco-"—*South Western Star.*

THE YERKES OBSERVATORY.—The great Lick Telescope is about to be superseded as the largest in the world, and will have to yield that pre-eminence to the Yerkes, says a contemporary, which will soon be ready for use in the building provided for its reception, at a spot about a mile from the town of William Bay, near Lake Geneva, in the State of Wisconsin, about seventy-five miles from Chicago, with the University of which the new establishment will be closely connected. The Yerkes Observatory was founded in 1892, through the munificence of Mr. Charles T. Yerkes, of Chicago. In that year Mr. Alvan G. Clark undertook the construction of an object-glass, 40 inches in diameter, for the principal telescope of this observatory. The instrument on which it was to be mounted was at once commenced, and completed in the following year, when it was exhibited at the Columbian Exposition of 1893. The object-glass has recently been tested by Professor Keeler, who considers that its definition is fully equal to that of the Lick, while its light-gathering power is considerably greater. The construction of the main building of the observatory was begun in April, 1895, and is now very nearly completed. Its form is that of a Roman cross, with three domes, and a meridian at the extremities. The principal dome (containing the great telescope, the tube of which, with its attachments, is about 75 feet long) is 90 feet in diameter and 110 feet high. On the ends of the arms of the cross are two smaller domes, to contain respectively a 12-inch refractor, transferred from the Kenwood Observatory, and a 24-inch reflector. Between them is the heliostat room, 100 feet long and 12 feet wide. The meridian room is at the end of the cross, farthest from the great dome, the latter being at the western end of the building, which lies east and west, and is about 330 feet long. Professor George E. Hale has been appointed Director of the Yerkes Observatory, and the well-known astronomers, Professors Burnham and Barnard (the latter of whom discovered the fifth satellite of Jupiter in 1892), will occupy positions there, while a separate department will be devoted to giving instruction in practical astronomy, to encourage astronomical study and research, at the University of Chicago, and train up a school of astronomers qualified in the future to further extend our knowledge of the most sublime and interesting of the sciences.

Patent News.

THE following applications for Patents were made between September 23 and September 30, 1896:—

DEVELOPING FILMS.—No. 20,831. "Improvements in Apparatus for Use in the Development and Treatment of Flexible Photographic Films or Tissue." A. P. OKELL.

ARTIFICIAL LIGHTING.—No. 20,877. "Improvements in and connected with Artificial Lighting Apparatus for Photographic and other Purposes." A. SALMON.

CHROMO-PHOTOGRAPHY.—No. 20,898. "Improvements in and relating to Chromo-photography." V. VAUCAMPS.

PORTABLE CAMERA.—No. 20,971. "Portable Photographic Camera." R. DAESCHNER.

SCREEN KINETOSCOPY.—No. 20,978. "Improvements in Apparatus for Obtaining, Exposing, and Projecting Pictures known as Animated Photographs." A. LOSCHER and R. KLEIN.

EXHIBITING PHOTOGRAPHS.—No. 21,015. "An Improved Method of Exhibiting Photographs." C. H. DANIELL.

CERAMIC PHOTOGRAPHY.—No. 21,081. "A New or Improved Method or Process of Producing Permanent Photographs on China and other Vitreous Surfaces." J. SLATER.

SURVEYING INSTRUMENTS.—No. 21,117. "Improvements in Instruments for Surveying with the Aid of Photography." J. B. LEE.

LANTERNS.—No. 21,203. "Impr vements in Lanterns, Magic Lanterns, and the like." D. ALLAN.

SCREEN.—No. 21,269. "An Improved Screen for Optical Projection Purposes." Complete specification. L. WRIGHT and J. ANDERTON.

CHRONO-PHOTOGRAPHIC APPARATUS.—No. 21,331. "Improvements in Chronophotographic Apparatus." M. J. H. JOLY.

CHRONO-PHOTOGRAPHIC APPARATUS.—No. 21,382. "Improvements in Chronophotographic Apparatus Adapted for the Projection of Positives upon a Screen." M. J. H. JOLY.

CHRONO-PHOTOGRAPHIC APPARATUS.—No. 21,383. "An Apparatus for Use in Exposing the Positive Films used in Chrono-photographic Apparatus." M. J. H. JOLY.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

October.	Name of Society.	Subject.
12	Bradford	*Bromide Printing.* Messrs. Nicholson and Newstead.
12	Camera Club	*Birds and Rocks.* Dr. Collins.
12	North Middlesex	*Venice and Lucerne.* W. F. Fenton-Jones.
12	Richmond	*Exhibitions and Hints to Exhibitors.* The President.
13	Ashton-under-Lyne	Lecture. W. Lamond Howie.
13	Birmingham Photo. Society	Demonstration on the Production of Carbon and Bromide Enlargements, Positives, and Negatives, by aid of the Society's Enlarging Lantern. W. Bateman and C. S. Bayntor.
13	Hackney	*The Treatment of Figures.* Rev. F. C. Lambert.
13	Lewisham	*At Home Subjects.* W. Thomas, F.R.P.S.
14	Camera Club	Testing Lantern Slides.
14	Leeds Camera Club	Beginners' Lecture.—II. *Exposure and Development.* A. Hombnrg.
14	Leytonstone	Special Meeting at New Headquarters.
14	Photographic Club	*Acetylene Gas for Ordinary Use and Lantern Projection.* C. Hoddle.
14	Southport	*The Practical Working of C.C. Paper.* George Cross.
15	London and Provincial	*Theory of Development.* E. Banks.
15	Camera Club	
15	Darwen	*Tour in Spain.* J. T. Lees.
15	Liverpool Amateur	Practical Demonstration. F. Anyon.
15	West Surrey	Lecture.
16	Croydon Microscopical	Conversational Meeting.
17	Leytonstone	Open Social Meeting.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 1,—Mr. Bedding in the chair.

Mr. WALL announced that the room would in future be open to members at seven o'clock on Thursday evenings, when the journals would be available to readers, and he hoped, in this and other ways, to make things more lively.

So far as it was ready, the programme for the session was read, and the desirability of their co-operation to fill up vacant dates urged on the members.

Mr. WELFORD, in the course of some remarks, said it had been thought advisable that there should be a paid Recorder to take notes of the Association's proceedings, and he proposed that such should be done.

Mr. HENDERSON seconded the proposition, and it was carried unanimously.

It being announced as an Open Evening, when various objects of interest would be discussed, Mr. HENDERSON invited the members to give their opinions as to the lighting of a portrait negative, which he brought up, and which was taken in a studio with gas light, supplied from twenty incandescent burners, with an exposure of six seconds. It was, moreover, untouched. He also showed a dozen interesting examples of Talbotype negatives on waxed paper, which had been taken between the years 1840 and 1855. Gelatine prints of one or two were shown, and they exhibited very little trace of grain. The rapid with which they printed was surprising. In answer to a remark, he thought they would enlarge pretty well.

Mr. BECKETT said it would be impossible to avoid the presence of grain in enlarging such negatives.

Mr. J. E. HODD said, while on the subject of paper negatives, that Mr. Wellington discouraged waxing of his negative paper, as it was found to intensify the grain considerably.

Mr. HENDERSON remarked that the different qualities of paper had a lot to do with that. There was considerable difficulty with modern papers, and waxing was injurious unless the paper was absolutely permeated.

Mr. WALL suggested that the difficulty arose from the fact that English papers were sized with gelatine, while foreign papers were resin-sized.

Mr. A. HADDON, in commenting on the oft-repeated statement that gelatine is tanned by pyrogallol, said he had published, with another, a paper showing that pyro itself did not tan gelatine, and he had brought up the basis of their conclusions in the shape of two sealed tubes containing mixtures of dry pyro, gelatine, and water, which, from certain peculiarities, showed that pyro itself had no tanning action. When oxidised, however, pyro will tan.

The CHAIRMAN believed that, in all these statements to which Mr. Haddon took exception, it was meant that the tanning action of pyro was when it was used in combination with the other constituents of the developer. He could not recall a definite statement that pyro, *per se*, had any tanning action.

Mr. HODD said that, as photographers, we were only concerned with pyro in conjunction with the developer, and it was well known that, in such a form, it possessed a tanning influence over gelatine.

With regard to hyposulphite of soda being a powerful solvent of metallic silver, Mr. HADDON showed a piece of paper enclosed in a tube, which was sealed some twelve months ago, containing a ten per cent. solution of hypo, and it could be seen that the metallic silver was still in the paper. If the hypo were a solvent, it would all have gone. On the other hand, in the presence of oxygen, hypo has this power of dissolving metallic silver. Mr. Haddon also showed a portion of a plate in a tube containing hypo since November last, the gradations being preserved from end to end.

Mr. BECKETT, after a remark by Mr. Everitt, that a negative left in the fixing bath for some days experienced a reducing action, said that it was not always so. If the bath had been much used, it exercised an intensifying action, and this was very noticeable with some plates if left too long.

Mr. HODD had heard many complaints about the action of metabisulphite on pyro, so that in a short time its developing power was destroyed. The relative proportions, as recommended, were one ounce to one ounce, but he had satisfactorily used much less. In reply to an inquiry, he said the action would not be set up by the addition of alkali.

PHOTOGRAPHIC CLUB.

OCTOBER 1,—Mr. Frank Haes occupied the chair.

Mr. HORACE WILMER handed to the Chairman a very beautiful portrait of the late Mr. William Bedford, which, on behalf of Mrs. Bedford, he asked the Club to accept. In presenting the portrait, Mr. Wilmer said: "In presenting this portrait of her late husband, Mrs. Bedford hopes that it will help to keep his memory green in the hearts of those whose affection he valued."

Mr. FOXLEE expressed the thanks of the Club and his own pleasure at receiving so kindly a gift and reminder of their deceased friend.

Mr. BRIDGE added his expression of thanks and appreciation of the gift. He, with others, had valued the friendship of Mr. Bedford very highly, and the photograph would serve as a very pleasant reminder to them all of him.

Mr. HAES put the proposition formally to the members that the Hon. Secretary should write to the donor and express the Club's thanks for the gift.

The motion was carried unanimously.

The photograph, which appeared to be a carbon enlargement, about 18×12, framed in dark oak and gold, is an excellent and characteristic likeness.

Mr. FRY introduced Mr. George Peck, an amateur photographer from Amsterdam, and the CHAIRMAN, welcoming Mr. Peck, said he hoped he would spend a pleasant evening.

Mr. SNOWDEN WARD delivered his lecture upon

SHAKESPEARE AT HOME.

By means of an excellent set of lantern slides, many of which attained a high degree of pictorial merit, Mr. Ward interested a full attendance, in which were included many ladies, for upwards of an hour. Mr. Ward's lecture consisted of the relation of an interesting sequence of local traditions, upon which he had skilfully contrived to build up the poet's life as a child, a lad, and a man. He showed a set of photographs of the several records of the poet's features, and dealt with their probable verisimilitude, finally suggesting the Droeshout picture as probably possessing the highest claims to authenticity. Other interesting illustrations were: Copy of registration of birth; the font at which he was baptized; some curious frescoes upon which the lad probably gazed; the church in which he was buried, &c. Mr. Ward held his audience deeply interested.

The CHAIRMAN congratulated Mr. Ward upon his very excellent lecture, and the capital negatives and slides, which he understood were the work of Mrs. Ward, had proved deeply interesting. They had seen Shakespeare in his home life and surroundings more fully, and more intimately, and better than they could possibly have known him before.

Mr. O'NEILL, a visitor from Birmingham, asked to be allowed to support the Chairman's remarks. He knew the district well, and he thoroughly appreciated the value of the lecture, which he hoped to induce Mr. Ward to deliver in Birmingham at an early date.

The CHAIRMAN declared it unnecessary to pass a formal vote of thanks. The meeting had, by its spontaneous acclamation, signified its full appreciation of Mr. and Mrs. Ward's efforts.

Borough Polytechnic Photographic Society.—September 30, Annual General Meeting, Mr. A. Bedding in the chair.—The SECRETARY submitted a

report for the summer session, which showed that thirty excursions had been made during the season to various parts of Essex, Hertfordshire, Kent, Middlesex, and Surrey, special mention being directed to the first outing, which took place on Good Friday, to Kingston and the neighbourhood; also to the Whit Monday excursion to Windsor, and to the August Bank Holiday outing to St. Albans, which took the form of a picnic, and proved to be the "success of the season." The following officers were elected for the ensuing year:—*President:* Mr. Edric Bayley, L.C.C.—*Vice-Presidents:* Rev. A. W. Jephson, M.A., Messrs. C. J. Whittuck Rabbits, J.P., and Walter A. Wigram.—*Chairman:* Mr. Alfred Bedding.—*Librarian and Curator:* Mr. W. J. M. Nunn.—*Hon. Treasurer:* Mr. A. W. Lovell.—*Hon. Secretary:* Mr. P. C. Cornford.—*Assistant Hon. Secretary:* Mr. P. J. Brown. The Second Annual Exhibition of the Society will be held at the Institute, 103, Borough-road, S.E., on Monday, Tuesday, Wednesday, and Thursday, December 28, 29, 30, and 31. There will be open classes. Entries will close on December 12. Full particulars and entry forms can be obtained of the Hon. Secretary, Mr. P. C. Cornford, 103, Borough-road, S.E.

Hackney Photographic Society.—On the 29th ult., Mr. William Rawlings presiding, the feature of the evening was a very interesting lecture, illustrated by lantern slides, on the *Half-tone Process*, by Mr. W. Gamble.

FORTHCOMING EXHIBITIONS.

1896.	
Oct. 9–Nov. 7	Photographic Salon, Dudley Gallery, Piccadilly. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 9–Nov. 12	Royal Photographic Society. R. Child Bayley, 12, Hanover-square.
,, 9, 10	Brixton and Clapham Camera Club. C. F. Archer, 1 Gauden-road, Clapham, S.W.
,, 26–31	Southport Social Photographic Club.
November 12	Dulwich Photographic Society.
,, 17–20.....	Hackney Photographic Society.
December 3, 4.....	Aintree Photographic Society. E. P. Heron, 2 Tilney-street, Orrell Park, Aintree, Liverpool.
Dec. 1896–Jan. 1897	Bristol International. Hon. Secretary, 20, Berkeley-square, Clifton, Bristol.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

TONING DIFFICULTIES.

To the EDITORS.

GENTLEMEN,—"Perplexed Printer," in your issue of October 2, relates a similar experience to my own. I, at one time, had great difficulty in toning gelatino-chloride with the sulphocyanide bath. There was always a delightful uncertainty about the result, one never knowing whether a print which left the toning bath a good colour would come from the fixing bath blue, yellow, green, or some other undesirable shade. I followed the manufacturer's instructions in the letter, but to no purpose. At last I determined to throw over the instructions and work along my own lines. By a process of varying one factor and then another, I arrived at the following conclusions:—

1. That the sulphocyanide bath should *not* be used immediately after mixing.

2. That, when once mixed, it should be kept in complete darkness until wanted for use.

3. That the washing before toning should be both thorough and regular.

In agreement with these conditions, I adopted the two-stock system mixing my bath in the following proportions:—

Stock A.	
Gold chloride	60 grains.
Water	60 drachms.
Stock B.	
Ammonia sulphocyanide	4 ounces.
Water	16½ ,,
Stock C.	
Stock A.....	2 drachms.
Stock B	2 ,,
Water	5 ounces.

Stock C must be mixed at least twenty-four hours before using, and kept in total darkness. I generally mix it once a week, finding no difference in the toning at the end of the week from the beginning. To tone, take four ounces of stock C for each sheet of paper to be toned, which allows about two grains of gold chloride for the sheet, and add it to thirty ounces of water, or, what is better, the same amount of old toning bath. The four ounces should be added between the sheets, that is to say, if six sheets of paper are to be toned, it is better to add the stock in six portions, rather than put the whole quantity in the bath at the commencement.

By adopting this method, I believe "Perplexed Printer" would be able to tone his paper with regularity, and obtain any desired tone. It has worked the same with the several brands that I have tried.—I am, yours &c., JOHN A. RANDALL.

42, *Tonsley-hill, East-hill, Wandsworth. October* 3, 1896.

CONVENTION SLIDES AT PALL MALL.

To the EDITORS.

GENTLEMEN,—Referring to the views of scenes visited during the Leeds Convention which are to be shown on November 4 at the Exhibition of the Royal Photographic Society in Pall Mall, will you kindly allow me to inform all Convention members that the slides must reach my address before Wednesday, October 28?

To avoid duplicates, a Committee of Selection has been appointed by the Council to meet on the evening of October 28, at Anderton's Hotel, Fleet-street.

The slides, after exhibition at Pall Mall, will be retained by the Council for some little time, as many Convention members have expressed their desire to exhibit them in their different districts.—I am, yours, &c.,

R. P. DRAGE, *Hon. Secretary and Treasurer.*

95, *Blenheim-crescent, London, W.*

THE KINETOSCOPE.

To the EDITORS.

GENTLEMEN,—The question of the invention of the kinetoscope, which has recently been discussed in your columns, may possibly be to some extent cleared up by a reference to the specifications of patents for the year 1869. It appears that, as early as 1868, M. Roman Talbot brought into notice an optical toy containing photographs which were made to pass rapidly beneath a Stanhope lens, and which, by the persistence of vision, gave the effect of motion. This instrument he called the kinescope. The patent specification, published in the following year, relates to an instrument called the photoscope, by which microscopic photographs on strips of glass were made to move beneath a lens. The different pictures were so arranged as to give the effect of life or animation.

There is very little difference, except in perfection of detail, between these early instruments and the kinetoscope of to-day. The principle, at least, has been public property for nearly thirty years.—I am, yours, &c.,

J. VINCENT ELSDEN.

"ABOVE THE MORNING MISTS."

To the EDITORS.

GENTLEMEN,—In your criticism of my weak effort hung this year at the Salon, you pointedly asked for an explanation of the title *Above the Morning Mists.* Firstly, I must express my picture a failure, because it fails to fulfil its title, to the photographic critics, and they *should* know. The idea was a picture, viewed from the mountain, of a village in the valley below, and the mists of morn partially or nearly obscuring it (the village) from sight; whereas the standing or viewing point, and the cottages in the mid distance, are, to all intents and purposes, above the mist which lays lower in the valley.

I have no doubt the criticism is a thoroughly good one; but to me it is an enigma. I have looked at it and read it time after time, looking at it sideways—even going to the extent of standing on my head and viewing it with my feet, but have ignominiously failed to understand the —"If so, therefore, what," &c.

As I fear I am missing some information, which I should know, I shall be pleased to have the criticism made clearer. FRED COOP.

Grove Villa, College-road, Bromley.

[We have submitted the above letter to our Critic. "Therefore —what," he tells us, is an interrogative method of expressing surprise that Mr. Coop took the photograph, sent it to the Salon and got it hung. Mr. Coop's frank admission that the result is "weak," and a "failure," however, removes all cause for surprise on the second and third grounds. Our critic is not a gymnast, otherwise he would endeavour to take an inverted view of Mr. Coop's photograph as it hangs, in the hope that its admitted weakness would not be so conspicuous.—ED.]

THE PHOTOGRAPHIC SALON: A WARNING TO INTENDING EXHIBITORS.

To the EDITORS.

GENTLEMEN,—When an artist is invited to send pictures to an exhibition, it is understood that his work is of sufficient merit to be worthy of a place, and it would be an insult to reject it.

The Photographic Salon, being superior to all other art clubs (in its own estimation), thinks or acts differently.

You may be requested to submit photographs, and pay 10*s.* or 12*s.* for carriage, as the writer has done, not to speak of frames, and have all your pictures returned.

Of course, no photographer of repute will submit to be dodged a second time in the same manner, but there may be many others who may be allured in the same way, and "waste their sweetness on the desert air."
—I am, yours, &c., J. C. OLIVER.

2, *Royal-terrace, Glasgow, Oct.* 2, 1896.

THE LINKED RING.

To the EDITORS.

GENTLEMEN,—In an article on *Exhibitions and Judges* in your issue of the 25th ult. Mr. Child Bayley, referring to a previous communication from Mr. Maskell, supposes that the opinions therein expressed may be "regarded . . . . as the Linked Ring's aspect towards the question." Will you kindly allow me to use the publicity of your columns to disabuse Mr. Bayley of his belief, and to say that no single member of the Linked Ring is authorised to speak on behalf of it as a body. It exists on the basis of a friendly agreement to differ, and the opinions and liberty of its members are untrammelled by any necessity for accord on the subject in question or any other.—I am, yours, &c.,

HENRY E. DAVIS.

Camera Club, Charing Cross-road, W.C., October 3, 1896.

TAKING PHOTOGRAPHS FOR NOTHING.

To the EDITORS.

GENTLEMEN,—I have to-day received a circular from the firm of diarists already referred to in your pages and have answered it. I enclose you a copy of my reply which you are at liberty to publish.—I am, yours, &c., H. H. H. CAMERON.

70, *Mortimer-street, W., October* 1, 1896.

"70, *Mortimer-street, W., October* 1, 1896.

"SIR,—I am in receipt of your circular, but do not care to accept the terms of business therein proposed. As an alternative scheme, I myself am going to publish an Almanac, and with your permission shall attach a coupon which will entitle the bearer to call and demand one of your excellent diaries *free of charge;* this will, of course, cost you nothing, and must prove a splendid advertisement for you. I shall only appoint one diarist in your district.

"I may mention that all the other diarists in your district consider this proposal impertinent. "Yours, faithfully,

"H. H. H. CAMERON."

THE PHARMACY ACT.

To the EDITORS.

GENTLEMEN,—I observe that your readers are taking a lively interest in the discussion which is at present going on over the above Act. I, for one, would be very much disappointed if extensive ill feeling were to be developed between photographers and chemists. I do not, however, think that there is much danger of this. As a matter of fact, it is not photographers who are guilty of offences against the Pharmacy Act, but men who supply photographic goods and chemicals, partly, no doubt, to professional photographers, but mostly to amateurs.

These men assume various fanciful names, such as "Photographic Chemists," "Dealers in Photographic Chemicals," &c., under cover of which they make infringements of the Pharmacy Act.

About their guilt there can be no argument. The Pharmacy Act is perfectly plain. It draws up a schedule of poisons, which cannot be sold by any but those who have complied with the educational demands of the State. If these men have not complied with those demands, they must not sell scheduled poisons. This, I should think, ought to be about as plain as a hole in a ladder. If they wish to set the Act aside, the only honourable method they can adopt is to try and get it repealed. In order to this end, they will have to prove that it has been no safeguard to the public, that poisons are no safer in the hands of those who know about them than in the hands of those who don't; that, in short, science and skill are in no way superior to ignorance and lack of skill. To argue that the Act was never meant to interfere with this trader and the other outside the bounds of qualification is in my opinion unworthy of thoughtful men. The glory of British law is that it respects not persons. A man may have been selling poisons before the passing of the Act; but, if he is not registered, he must not sell them now. He may never have had an accident, and he may be as careful as the most careful chemist, but if he is not registered he must not sell poisons. The law may never have been brought to bear upon him until now, but he has been living in the shadow of it all these years, and, if it has at last fallen, he ought rather to be thankful that this catastrophe did not happen sooner than be angry because it has happened at all. After all, I cannot see why photographic dealers should make so bold a fight. The trade in scheduled poisons is not great. We all find it a labour at times to take signatures and make inquiries about a few pence worth of corrosive sublimate, for instance; and, as a matter of fact, unqualified dealers cannot legally keep a poison book, or take signatures at all. I cannot see that they would be much damaged by filling their orders and sending customers to chemists for things they may not supply. Customers would soon learn to know exactly what must be got from chemists, and unqualified dealers wouldn't be any the worse.

The Pharmacy Act has been in existence for a good many years now. It has not hitherto been very strictly applied. Similar Acts upon the Continent have made much more progress. It cannot be said that chemists have used it harshly against men who were old in business before it became law. The advance of science and national progress demand that this Act, and various other Acts of a similar type, be more stringently carried into effect. It is conclusively proved that the Pharmacy Act has been a great benefit to the nation; and, as a matter of fact, the nation soon abolishes laws which are found to be of no service. Most of the men who are offending against the Act have been acquainted with it all along, and must have known that they could not go on for ever breaking a law which is just as binding upon mankind as the law which forbids people to kill.—I am, yours, &c., JAMES REID.

Dumfries, October 1, 1896.

To the EDITORS.

GENTLEMEN,—Your correspondent, "Nemo," who, by the way, has chosen an exceedingly apt *nom-de-plume*, has a peculiar method of argument. His idea seems to be that of endeavouring to cover his opponents with every kind of malignant abuse and contempt.

I should like to know what title this photographic Shimei has to throw aspersions upon an honourable craft, the members of which probably have as much honesty, as the world goes, as the members of any other fraternity?

In a series of anecdotes, the falseness and absurdity of which would be patent to any reasonable person, he asks us to believe that chemists generally are charlatans, bumptuous, and, worst of all, dishonest. Now, there are bumptious as well as black sheep in every fold, and I doubt not that in every business as well as in this there are men who in this way deceive themselves, but not others; but, really, one is reminded of the old proverb, "Those who live in glass houses should not throw stones."

Who ever read a more bumptious letter than that of "Nemo?" Like most bumptious people, he gives himself away in every sentence. He lets us know that he is on speaking terms with an eminent London surgeon. It is a great pity that he doesn't improve these valuable conversations with his distinguished friend by asking him to set him right in his ideas of the Pharmacy Act relating to poisons. He would certainly inform him that the law does not require the signature in the poison-book with certain poisons, but it does with others, and for very good reasons. He would tell him that the Poisons Act was not framed by the Pharmaceutical Society, but by Parliament, and that the Society is intrusted by the Government with the duty of seeing it properly carried out. Oxalic acid and spirits of salts are dangerous chemicals, but they are things of daily necessity, and consequently are found in every household. They are not virulent poisons in the same sense as perchloride of mercury, two grains of which are sufficient to convert any person into a "Nemo." Common drugs, such as Epsom salts, or bicarbonate of soda, will produce death if they are only taken to the extent of a few ounces.

As a photographic chemist I should personally not have the smallest objection, from the pecuniary point of view, to any one selling corrosive sublimate. The law was framed, however, to protect the public, and, with poisonous substances, as with everything else, one has to draw the line somewhere. Your correspondent's remark about the ignorance of chemistry among chemists is distinctly untrue. In order to obtain the qualification of pharmaceutical chemist, the examination in organic and inorganic chemistry is of an equal stringency with the B.Sc. examination, and possibly "Nemo" will marvel to learn that a complete and an advanced knowledge of botany, and physics, and other subjects is essential to success in the examination. The fable about his having been charged eighteenpence for a gallon of distilled water I do not believe, nor, I am sure, will any one else; nor will any one, I am confident, support the principle that, because an individual has chanced to forget that supplying "Nemo" with goods previously cost this courteous customer eighteenpence only, instead of half-a-crown, he is necessarily dishonest. Dishonesty as often lies in making wrong interpretations of other people's actions as it does in taking advantage of their ignorance.—I am, yours, &c., A PHARMACEUTICAL CHEMIST.

October 3, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Debenham & Co., 5, Clifford-street, York.—*Photograph of Rev. Canon Temple.*

A. James Tyler, 8, Creek-road, March, Cambs.—*Photograph of railway collision at March Station on September* 23, 1896.

RECEIVED.—T. HAYWARD; F. WHALEY; A. EVANS. Thanks. Next week.

ACETYLENE FOR PORTRAITURE.—ACETYLENE LIGHT. See the present number of the JOURNAL; also write Messrs. Thorn & Hoddle, 169, Camberwell New-road.

LENSES FOR STEREO WORK.—PYRO. For such work as you describe, a pair of lenses of the rectilinear type, *not exceeding* four inches focus, would perhaps be best.

RETOUCHING MEDIUM.—PYRO says: "Would you kindly give me name of dealer in London supplying retouching medium mentioned in Harold Baker's letter in recent issue; also the name it is sold under?"—It is sold under the name of Harold Baker's retouching medium by Messrs. Houghton & Sons, 89, High Holborn, W.C.

PHOTO-LITHOGRAPHY.—R. SIMMONDS. As the transfer ink adheres all over the paper, it is pretty clear that the gelatine coating has become insoluble, *i.e.*, does not absorb water in the unacted portions (by light). Too long keeping after sensitising, exposure to light, &c., may be the cause. Dry quickly and use soon afterwards.

LENS APERTURE.—R. MATHER says: "I beg to draw your attention to Mr. Gruncell's interesting letter on 'Flashlight Photography,' which appears in last week's issue of your valued JOURNAL. On p. 78, line 12, I read: 'My whole-plate flashlights are taken with one-sixteenth inch.' May I ask, Is this not a misprint for six inches?"—Probably a "six-inch lens" is meant.

A HISTORY OF PHOTOGRAPHY.—BOOKS says: "Will you kindly inform me whether there is such a book published that gives the full history of photography from the time it was first invented, and through what publisher can I obtain such a book?"—In reply: There is a very good *History of Photography* by Mr. W. Jerome Harrison. It is published, we think, by Messrs. Iliffe & Son, 3, St. Bride-street, E.C. We do not know the price.

ADDRESS WANTED.—W. G. STRETTON, of the Port Commissioners, Rangoon, says: "A few months ago I noticed an advertisement in your paper to this effect: 'To put clouds in bromide prints, 2*s.* 6*d.*.—Haig.' I forget the address. I remitted 2*s.* 6*d.* for the pamphlet by money order, but forgot to advise by letter. Will you kindly give the address through your columns?"—In reply: The address is, J. G. Haig, 14, Davisville-road, Shepherd's Bush, W.

HALF-TONE THREE-COLOUR NEGATIVES.—HELIOS says: "Would you please tell me if it is possible to take half-tone, three-colour negatives direct from original, using wet collodion? If so, what colour filters and sensitisers would you recommend for use with Fleming's heliochrome inks? If I procured a spectroscope and prism, would I experience much difficulty in making my own screens?"—In reply: See leading article in the present number of the JOURNAL.

PATENT SHUTTER.—DOUBTFUL asks: "Will you please tell me if the patent for shutter as advertised is a valid one, and if ——'s patent does not anticipate it, and which has already expired?"—We do not give advice on the subject of the validity or otherwise of photographic patents, and, if we did, we should hesitate to hazard an opinion with regard to shutters—their name is legion. If you are really interested in the matter, you had better consult an experienced patent agent.

COPYRIGHT.—T. BENCE. If the photograph was taken to your order, and the copyright in it duly assigned to you by the one who took it for a stipulated sum, the copyright is undoubtedly yours. Therefore you should lose no time in proceeding against the illustrated paper for its infringement. Considering the subject, and the fact that the photograph cannot be repeated, as well as its interest, we should advise you to assess the damages at a fairly substantial amount, particularly as the journal in question has a very large circulation.

CLASSES IN CONNEXION WITH THE SCIENCE AND ART DEPARTMENT.—SNARK says: "I shall be much obliged if you will inform me if there are any classes in photography held in connexion with the Science and Art Department at South Kensington, or anywhere else in or near London, otherwise than those at the Regent-street Polytechnic?"—In reply: We are not aware of such classes being held. Some reader may perhaps be able to say whether there are any; but the City and Guilds Technical Institute of London conduct examinations in connexion with the Polytechnic and similar classes.

LENS.—J. R. CROSSE. The lenses in question are in high repnte. Yonr measurement of the focus, "about six or seven feet from a gas flame," is too indefinite to form any opinion on. We should say, from what we know, that the lens is well adapted for quick work. Of course, the smaller the stop used the longer must be the exposure, but, at the same time, the greater will be the "depth of focus." It is, of course, quite possible to get good enlargements from hand-camera negatives, provided they are sharp. If they are not sharp, we have little hesitation in saying that it is not the fault of the lens in question.

GERMAN PHOTOGRAPHIC PAPERS.—A. O. YARDLEY says: "Can you give me any information respecting advertisements for photographic situations in Germany, whether there are any papers for the purpose? I am desirous of obtaining such a situation as assistant operator, retoucher, and in the reception room."—In reply: We append the names of the principal German photographic papers and the towns of their publication. You must write them for further particnlars, their charges, &c., for advertisements, which we are unable to give you. *Photographisches Wochenblatt*, Potsdammer-strasse, 89, Berlin; *Deutsche Photographen Zeitung*, Weimar; *Photographisches Archiv*, Düsseldorf; *Photographische Mittheilungen*, Dessauerstrasse, 46, Berlin.

WOODEN DEVELOPING TRAYS.—H. V. says: "I have had three wooden tanks made for washing bromide prints, but I find they leak very much: so would you kindly inform me of the best means of stopping the leaking?"—In reply: Coat the joins of the trays with melted paraffin by means of a brush; a mixture of melted resin and beeswax also answers.

GRUBB'S RECTANGULAR PRISMATIC STEREOSCOPE.—STEREOSCOPE says: "At the beginning of the ALMANAC for 1895 there is an article on the *By-paths of Stereoscopic Photography*, and in this there is a description of Grubb's rectangular prismatic stereoscope (illustrated). Could you favour me with full particulars as to dimensions, &c., to make one, or can they be bought ready-made? Also, please say the size of the prisms, and if lenses are required as well, and where the prisms can be bonght."—In reply: The fullest, and, indeed, the only available, information on the subject is contained in Sir Howard Grubb's original paper on *Some New Forms of Stereoscopes*. This is printed at p. 74 (February 14) of our volume for 1879, to which we must refer our correspondent.

COLOURED TRANSPARENCIES.—C. H. PRICE says: "I saw, some time ago, a method of toning gelatine transparencies. I thought it was in the JOURNAL, but, after looking through the back numbers, I was unable to find it, and suppose it was in some other paper. I shall be greatly obliged if you can assist me. I propose to tone a few transparencies made on the ordinary dry plate, sepia, blue, and green. Will you kindly tell me how to proceed to get these colours, and whether the developer employed would make any difference in the result? I use pyro soda."—In reply: We cannot trace the article referred to. We know of no process of development which, in one transparency, will simultaneously yield sepia, blue, and green tones—for that is what our correspondent appears to want.

COLOUR PHOTOGRAPHY.—W. A. DELLBAR says: "Will you kindly inform me whether Ives's process of colour photography has been made public, and, if so, what it is?"—In reply: Yes; the process referred to has been frequently described in our pages by Mr. Ives and others. We should recommend our correspondent, if he is interested in the subject, to run through the indices of the volumes of this JOURNAL for the past seven or eight years, and read the various articles on colour photography. In the mean while, we may briefly state that the process referred to consists in the main of taking three negatives through three different colonr filters, making therefrom transparencies, which are, as it were, exactly superposed behind their respective colour filters, and viewed or projected as a transparency. See this JOURNAL for January 17, 1896, for a fuller description of Mr. Ives's process, camera and photo-chromoscope.

LIGHT WITH LONG AND SHORT-FOCUS LANTERN OBJECTIVES.—BLOW THROUGH says: "I should be greatly obliged if you would give me in your next issue an answer to the following question: Would an illuminant (say, safety jet), which will light a ten-foot disc with a six-inch objective, light equally well a disc of the same size with a nine or twelve-inch objective, the same aperture being used in all cases; or would the greater distance it would be necessary to remove the lantern from the screen with the longer-focus lenses operate prejudicially on the brightness of the light?"—In reply: We quote from an article on the subject that appeared in a former volume of the ALMANAC: "When it is considered that a long-focus objective demands that the light be brought nearer to the condenser, and that an objective of large diameter will grasp and project all the rays, it will be seen that, unless the atmosphere in the hall be thick and absorbent of light, there is no reason why the screen should not be well illuminated."

PHOTOGRAPHS FOR A BAZAAR.—C. W. M. writes: "A curate in our village took some half-plate negatives of the exterior and interior of the church. They were very bad, but he brought them to me to touch up and make the best I could of, and to make several dozen prints from, to sell at a bazaar as his own work as an amateur. The negatives wanted a lot of working upon, and dodging in the printing and like most work of the kind, was more trouble than it was worth. The prints were sold at the bazaar at one-and-sixpence each. I sent in the bill for the prints, mounted on tinted mounts, as six shillings a dozen, and now he refuses to pay because the charge is *exorbitant*, as the mounts only cost so much per dozen and the paper so much a sheet. My name in no way appears on the prints, as they were sold as being taken by the Rev. ——. How shall I act?"—The charges are very reasonable, and we should say, Take out a summons at the County Court, and, no doubt, it will be at once paid by the curate, who takes sole credit for the work.

CARBON TISSUE.—NORMAN asks: "Would you be so good as to give me, in your Answers to Correspondents, a formula for carbon tissue? I want to know the percentage of gelatine required, in the first place, and, secondly, if a 'soft gelatine' is one that will absorb a large quantity of water. *Quantum suff.* of a soft gelatine is the extent of information usually given in text-books."—The manufacturers of carbon tissue do not publish the formulæ they employ therefore we are unable to give those of any of the commercial tissues. This will, however, give a very good tissue: Gelatine (say, Nelson's transparent sheet gelatine), 4 pounds; sugar, ¾ of a pound; water, 15 pints; pigment (whatever is preferred), *quant. suff.* This must only be taken as a rough guide, as gelatine, even of the same brand, varies with different batches, and, in dealing with them, experience is required to obtain the best results. It will be manifest that, in the selection of the pigments to be used, only those must be chosen for the different colours which will be inert on the gelatine, and themselves unaffected by the bichromates—Indian ink or lamp-black, for example. By "soft gelatine" is generally understood a soluble kind, such as those known as "soup gelatines," in contradistinction to the hard kinds, such as Coignet's Gold Medal, and the like.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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OUR FORTHCOMING ALMANAC.

The British Journal Photographic Almanac for 1897 is now in an advanced state of preparation. A feature of the volume for the past thirty years has been the co-operation of numerous friends and readers of the Journal, and the Editor takes the opportunity to express the hope that the support so kindly placed at the disposal of his predecessors may be continued to him.

We especially invite contributions on topics of practical interest, and should feel obliged if the articles and any accompanying sketches are sent to us at once.

Secretaries of Societies, and especially of those established since the appearance of the last Almanac, will oblige us by forwarding lists of officers and other details for inclusion in the Directory of Photographic Societies, in order that the list may be made as complete as possible.

The Publishers wish us to remind intending advertisers that the announcement pages of the Almanac are filling rapidly, and that, to ensure insertion and good positions, orders and copy should reach them forthwith.

EX CATHEDRÂ.

The Annual Meeting of the Photographic Copyright Union, held on October 8, and that is reported in another part of the Journal, passed off extremely well, barring a slight note of dissatisfaction as regards Rule 23, which fixes the minimum fee to be charged by members at half a guinea. But the Chairman pointed out, as it has been pointed out over and over again, that the minimum fee was decided upon after great deliberation, and having regard to the fact that it was desirable to consult the interests of the greater instead of the lesser number of photographers. We have so recently (August 14) exhaustively reviewed the work of the Union and discussed its prospects, that it is unnecessary for us to traverse the ground again; but we may remark that our continued observation and experience of what we may term the Copyright Conflict, in which photographers are at present engaged, justifies us in again advising them to join the Photographic Copyright Union, which does useful work that benefits the whole photographic profession, and charges its members no subscription whatever!

* * *

In response to our inquiry of last week as to whether some purchaser of the secret method of preventing halation, already referred to in our columns, would tell us if we had been rightly apprised as to its nature, a correspondent sends us a complete copy of the formula, from which it will be seen that our original information was correct: "Plan or method to prevent fog or halation during the photographing of interiors of every description: First place your camera in the proper place and focus, then attach a small piece of wood, or wire, from the front of camera above lens, about eight or nine inches long, so that the end will clear hood of lens; then suspend, by means of very fine wire, a piece of either thin zinc, brown or black paper, cut the size and shape of window or windows, as shown on focussing glass (on which it might be traced from), move it backwards or forwards until you see it exactly to cover the window on focussing glass; this must be done with the diaphragm you intend using. Now, we will presume that the exposure required for interior would be one hour; after exposing remove the adapter from before the lens, and expose the whole from three to four minutes according to the amount of transparent glass. Of course, judgment must be used, in case the time of exposure be more or less."

We are informed that Dr. Eder, of the Imperial High School of Photography, at Vienna, has purchased about thirty reproductions of the pictures now hanging in the Exhibition of the Royal Photographic Society in Pall Mall. This result is directly traceable to the Society's illustrated catalogue.

* * *

Messrs. F. Braby & Co., of Fitzroy Works, 352 to 364, Euston-road, N.W., draw our attention to the fact that, after experiments lasting over three years, they have perfected a solder for aluminium which they find, from severe tests, will not only hold but will make a bright, strong, clean, and neat joint. Messrs. Braby state they do not sell the solder, but they invite manufacturers to send their work to be soldered by them.

* * *

During the sojourn of the Emperor of Russia at Balmoral, two famous photographs of the Royal Scots Greys, published by Messrs. Gregory, of the Strand, were submitted to His Imperial Majesty, who graciously expressed a wish to retain them. One of them shows the entire regiment on parade at the cavalry barracks at Aldershot; the other, a section of four members of the regiment engaged at tent-pegging. This latter photograph is a very remarkable specimen of instantaneous photography. The object the photographer, Mr. F. G. O. Stuart, had in view was to get a picture at the moment that the lances of the horsemen struck the pegs; it was therefore arranged that the camera should be placed immediately in front of the advancing cavalrymen, and about twenty-five yards from the pegs; and, in order not to run down the photographer, it was arranged that, immediately the pegs had been struck, the two left-hand men of the section were to wheel to the left, while the two on the right wheeled to the right. The result was eminently satisfactory, for, by a most extraordinary stroke of good luck, each man caught his peg, and the picture obtained is a perfect representation of four horses at full gallop coming straight at you. The shutter used was the Thornton-Pickard focal plane, and the exposure on this particular occasion was the one five-hundredth part of a second.

* * *

Mr. W. P. Marsh, of Bognor, writes us: "I enclose a cutting from the *Lady* of October 1, 1896, a reprint of which, I think, would amuse many readers of the Journal who may not have seen the *Lady*. If this expert girl photographer would take into partnership an expert boy ditto, what a fortune they might soon make when on their holiday trips! No wonder professional photography is not as of yore. Perhaps the expert young lady could honour the coupons of the celebrated firm of diarists?"

* * *

We append the extract referred to:—

"Itinerant photography as a possible employment for women has its good points, though they will not appeal to the gentle sex when lusty winds do blow, and the rain it raineth every day, as now. However, for next year the idea has its advantages, and should be stored up in the memory-box of those who want 'holiday engagements.' Good accounts reach us of the comfortable little sum made over and above her expenses by an expert girl photographer this summer. She, with her camera, went a trip through some lovely country, and obtained very great success as a portrait-taker, also receiving orders from people for favourite nooks and crannies in their gardens and houses, family groups, and actually pet and agricultural-show animals. Her winter's work will consist in making albums for sale in the districts she has worked, and lantern slides which she will sell to local and district dealers in these now fashionable commodities."

* * *

It is to be hoped that the financial success alleged to have been secured by the young lady referred to will not incite other members of her sex to pass their holidays in a similar manner. "Itinerant photography," as it is here understood, is a precarious method of earning money, unless, as in the few successful cases that we can at this moment call to mind, it is followed up in a systematised business way. We are aware of some photographers who live caravan fashion from April to October, and make a living by travelling photography, but it is hard work. "Itinerant photography," even as a holiday engagement for ladies, looks pretty and poetical on paper; in practice, it would almost certainly be found prosaic and unsatisfactory, especially, we fear, to the amateur young women's patrons!

PANORAMIC PHOTOGRAPHS TAKEN IN SECTIONS.

In concluding the previous article on the above subject (see page 611, *ante*), it was incidentally mentioned that there were other methods by which the junctions of the various sections can be more successfully hidden than is possible by mounting the finished prints in juxtaposition. It is obvious that, if the picture were on one piece of paper, and from a single negative, a better result would be obtained in the end than by printing from the negatives separately, and joining the prints afterwards. This can be done by reproducing the various negatives as a single one. Doing this may seem a formidable undertaking to some, but it really is not so in practice.

Premising that the negatives were taken with the precautions alluded to in the previous article, this is the procedure. We commence by neatly stopping out the sky in all the negatives with black varnish, so that it prints quite white. The next thing is to make transparencies from them in film form. The best way of doing that, for the present work, is to make them on celluloid films. It is scarcely necessary to mention that they must all be of the same density and of the same colour. The exposure, which is best made to artificial light, should be full, so that, when the pictures are developed, there are no really clear portions except the skies. These should be free from tint, or, if tinted at all, the tint should be precisely the same in all of them. It is, however, better to avoid any tinting whatever, either by a liberal use of sulphite in the developer or by the use of one free from staining properties. The transparencies should be made tolerably dense, or a vigorous negative cannot be easily obtained from them. If there should be a difference in any of the transparencies, it will be better at once to replace the faulty ones rather than attempt any after-dodging. No trouble should be spared at this stage of the work, because on the character of the transparencies depends entirely the perfection, or otherwise, of the negative.

A perfect set of transparencies having been secured, we next proceed to combine them in the following manner: Take a sheet of perfectly flat glass—preferably patent plate—large enough to contain them, and place it upon a retouching desk, or prop it up in a sloping position in front of a window, with a piece of white paper behind it to reflect the light through. Now take, say, the centre transparency and secure it, top and

bottom, in position on the glass with strips of gum paper. Then take the next one, and adjust that in position in the same way with gum paper, top and bottom, and the same with the others, the duplicated portions of the subject, when superimposed, serving as accurate guides, as in the method of mounting the prints described in the former article. When all the transparencies are fastened to the glass, the overlapping films are cut through with a sharp penknife and the released portions of films removed; the junctions are then perfect, as the edges butt exactly together. In making the cut a keen edged thin knife should be used, so that both films are cut clean through at one cut; this will require some pressure if the celluloid is thick. Instead of making the cuts in a direct line, it is preferable to take them round some of the darker parts of the subjects when that is practicable.

The transparency may now be retouched if desired. This is easy to do, as it is a representation of what the finished picture will be. Should the junctions happen to be a little chipped in the cutting, they may be touched up with water colour; but, with careful working, that will not be necessary. The sky will, of course, be clear glass, and clouds may be introduced with water colour, or, better still, by coating the back of the glass with matt varnish, and then stumping in the clouds on that with plumbago. It will be advantageous, in introducing the clouds, to put the darker portions of them over the joins. If the sky be left plain, it will, of course, be white when the negative is printed from. Then the clouds, or shading, can be introduced in the print by double printing; but by far the best plan is to put the clouds into the transparency, and thus save the trouble of the double printing. Natural clouds can, if desired, be introduced in the transparency by printing them, or enlarging them, as a transparency, on a celluloid film, and mounting that on the back of the plate.

The transparency being completed, it only now remains to make a negative from it. This may be done on a dry plate, by contact printing, or it may be made on a suitable bromide paper—such as Wellington's special negative paper, for example; it may also be made on some of the print-out papers. If the latter be employed, the printing must be carried much further than for an ordinary print, and should be fixed without toning. If the clouds are put in on the back of the transparency, the exposure for the negative should be to fairly parallel rays. If at the junctions, owing to the unequal lighting given by the lens, there is a little unevenness in the density, a little colour or plumbago applied to the back of the negative will set matters right. We now have a negative of the panorama—taken in sections—in which, provided the work be skilfully done, the various junctions will be quite imperceptible.

Lunar Photograph.—In the current number of *Knowledge* is a photograph of a portion of the moon on a very large scale—forty-four inches to the moon's diameter. It was taken with the great Lick telescope and the Brashear enlarging lens, and represents the ragged surface of the moon with its craters and walled plains with marvellous reality.

The Duration of the Röntgen Radiation at each Spark.—This subject was discussed at the British Association, the other day, by Dr. F. T. Trouton, the results he obtained with a simple apparatus that he described showing that the radiation lasted for a time varying from $\frac{1}{300}$ of a second to $\frac{1}{10000}$. Similar results were obtained with a phosphorescent screen, but the same exactitude was not attainable as with photographs.

The Wet Weather.—If the vaticinations of the prophets who say we are bound to make up our average of wet after the abnormally dry summer be true, there is rain and plenty of slosh to come before that average arrives, for it is not yet reached in many parts of the country. Mr. Sowerby Wallis, writing from Camden-square, says that last September was the first extremely wet month since October, 1880. The total fall registered at Camden-square was 5·51 in., or 3·17 in. more than the average for the month during the thirty-seven years, 1859–95. The Rev. C. Holland, writing from Petworth Rectory, says: "I have registered rain in Sussex for over forty years, but in no year has there been rain on so many days in any one month as in this last September. On all except six days rain has fallen, bringing the total fall up to 7·56 in. Even in October, 1880, when all but 10 in. fell, it came in sixteen days."

New Cinematograph Effects.—A writer in *La Nature* suggests a series of views for use with this popular instrument, which, whatever their practicability may be, are certainly novel, and would be interesting. One of his proposed series is to take, at easily reckoned intervals, negatives of a rose tree from the time when it began to throw out its buds till the fall of its last leaves, then to use the plates for a cinematograph set. We shall thus have the novel effect of a rose tree throwing out leaves and flowers and then gradually withering away. In like manner, a landscape might be taken and shown on the screen, so that in a short space of time we might watch it covered with snow, then quite bare of interest, to be followed by growth of leaves on the trees, harvest in the fields, and so on. It is true that to obtain such effects would involve so many difficulties, such waiting, and such security from disturbance of apparatus for a long period of time, that it might not pay; but it is equally true that, well done, the result would be a great success, and, if the popularity of the instrument is to continue, it will need to be fed with continual novelties.

Explosive Properties of Acetylene.—M. Berthelot, in conjunction with M. Vieille, has carried out a series of experiments upon the explosive conditions of acetylene. They have examined successively the results of pressure and of concussion, and an account of their conclusions was read at the last meeting of the Paris Academy of Sciences. The influence of pressure is remarkable. At ordinary pressures the gas does not detonate; but, in closed vessels, at a pressure of two atmospheres, it needs a duration of ·76 of a second; at six atmospheres, ·066 of a second; at twenty-one atmospheres, ·017 of a second, for detonation to take place. With liquid acetylene, in a metallic vessel of a like capacity which would hold about 300 grammes, explosion takes place when a red-hot platinum wire is inserted, the effect then being exactly equal to the explosion of so-much nitro-glycerine or of gun-cotton. The effects of concussion are, on the contrary, negative. If the bottle was dropped from a height of 6 metres, no explosion took place; but the fall of a piece of metal 286 kilos in weight (about 3 hundredweight) from a height of 2 metres, resulted in the liquid detonating. With regard to the handling of the vessels of liquid acetylene, M. Berthelot recommends care in opening the vessel, and not to do it too hastily for fear of bringing about an elevation of temperature sufficient to cause an accident. Finally, if the water be allowed to reach the calcium carbide drop by drop, it will become red-hot and explode. It is necessary to avoid allowing any portion of the apparatus or its contents to become red hot.

Röntgen Rays at the British Association.—This subject was naturally one of absorbing interest at the meeting of Section A. Herr Lenard was there, and, discussing the nature of the rays, believed that, if Mr. Crookes' tube be continued beyond the window of aluminium he used, and the pressure of air be reduced, the ray travels much farther, and this fact favours the view that the radiations are not due to projected matter, but are of the nature of ether waves.

Sir G. Stokes, as we have before mentioned, maintained the view that the rays are due to projected matter. "The inside of the

aluminium window is bombarded by molecules of gas, or by particles discharged from the electrode. Why should not this bombardment give rise to a corresponding projection of molecules from the outside of the window?"

Professor Rucker had examined the transparency of various solids and gases, and, among other things, found that certain kinds of china are almost as transparent as glass, while others in the manufacture of which bone ash is used are almost opaque. He thought this method of examination might be very useful to china and porcelain collectors.

Curious Developments in Röntgen Ray Sciographs.—Mr. Espin, writing to the *English Mechanic*, details some very singular investigations he has been carrying out. On a former occasion he found double images—one positive, one negative—of metallic objects used as obstructors. For a long time he failed to discover an explanation of the mystery, but he writes: "However, at last a gleam of light came, and in a most singular way. I had, before leaving home, been using bits of a half-plate film cut into six. For a week three had been left in the box. Here they lay on the top of each other, and, as it happened, crossways. On using the top one, nothing was found save the ordinary position of a ring; but the second and third each showed clearly the impress of the film lying above it. My suspicions were at once aroused; but, unfortunately, in came a medical case and prevented my being positively sure; but I think it will probably be found that, if a metal, or perhaps other object, be allowed to lie upon a sensitised film for a few moments, and then moved to another spot, after exposure to the X rays the first will yield a negative and the second a positive of the object. If this be correct, then the mystery over which I have spent so much time will at last be elucidated. Once I had a film that would not lie flat, and I had to take off the objects to straighten it: on developing it, I found a confusion of positives and negatives, quite inexplicable. Sometimes, too, the rings may have moved in carrying them from the dark room to the apparatus. Here, then, there is the possibility of the explanation of the double images; but even then the result is very difficult to understand. Why, for instance, should it happen that an object placed for a few moments in contact with a film can neutralise the action of X rays, and the same object, if left in that position, increase their action? And there is a further consideration, Does this arise through heat? If so, one can understand how taking up the ring with the fingers throws it into molecular vibration, and that this is communicated to the film, and in some mysterious way neutralises the action of the X rays. If this is so with a ring, is it not possible to conceive that, if an image of the sun is formed on a thin brass or copper foil, and a sensitised plate placed behind, the surface would be affected, and Mr. Packer's results be explained?"

ON COLOURED SCREENS FOR ORTHOCHROMATIC AND THREE-COLOUR WORK.

In the current number of the *Photographische Correspondenz* Dr. J. M. Eder considers the question of the plates and light filters for ordinary and three-colour work, and points out that, although well-made commercial orthochromatic plates can be obtained, yet there is no great difficulty in sensitising plates by bathing them, and states that collodio-bromide plates, sensitised with fluorescine or acridine yellow, are the best; for orange yellow, rose bengal; for orange red, cyanine; whilst an ordinary wet plate should be used for the blue violet.

The light filters must be spectroscopically adjusted to each plate, and they may be prepared in three different ways, either by using glass coated with coloured collodion, or with gelatine, or else solutions may be used in cells. Collodion is, of course, most convenient for spirit-soluble dyes, gelatine being more suitable for the water-soluble dyes.

Eder recommends the coating of glass plates with a filtered solution of gelatine, about the same strength as is used for emulsions, to which a little acetic acid is added. The plates, when dry, are soaked in aqueous solutions of the dyes, and then rinsed and dried.

For bright yellow screens picric acid should be used, for golden-yellow screens Martin's yellow, which absorbs more of the blue-green than picric acid, for orange-yellow screens β-naphthol orange, and for reddish orange erythrosine. To cut out the whole of the blue-violet and bright blue a gelatinised plate should be bathed in picric acid, then in Martin's yellow, and then in β-naphthol orange, and with an eosine or erythrosine plate such a screen gives the yellow-green, with a fluorescine or acridine-yellow only the green.

Eder points out the possible failure from using too thin glasses, which may bend when cemented together, and affect not only the definition but the focal length of the lens, and states that, when using a lens of sixty cm. focus, and focussing same size, he found the focus shortened by 1·3 cm.

He strongly recommends the use of liquid filters, and states that several very fine reproductions of difficult subjects have been produced at the Vienna Institute by means of them. With cells the same trouble of alteration of focus may occur, and therefore he suggests the use of one cell only, which should be filled with water for focussing.

Green light filters are, says Eder, quite unnecessary if a plate sensitive to green and insensitive to red be used with a yellow screen, and a blue or violet filter is unnecessary if plates only sensitive to blue violet are used.

FOREIGN NEWS AND NOTES.

Ultra-violet Light.—M. Zeuger in a recent communication to the Société Française, detailed some experiments he had been making with ultra-violet light, and he states that, if an ordinary dry plate be fixed without exposure to light, well washed, and whilst still damp powdered with the double sulphate of ammonium and uranium, a fluorescent screen of perfect surface will be obtained when dry, and that, if the direct sunlight be concentrated by means of a quartz lens, and the hand, a fish, or some similar object, be placed on the glass of the fluorescent screen, it is quite possible to see distinctly the bones, or rather their shadow, as with the X rays.

Iron-Printing.—Ardut & Troost, of Franckfort, have found that, if a sheet of paper free from chlorides be floated on a mixture of—

Ammonio-citrate of iron	96 grains,
Silver nitrate	20 „
Tartaric acid	20 „
Gelatine	15 „
Water	2 ounces,

and then dried, it gives a printing paper which is five times as sensitive as ferro-prussiate, and that it will keep for several months, and gives, on washing with water after exposure, a dark brown image.

Made in Germany.—It has generally been considered, even on the Continent, that English amateur photographers were a long way ahead of all their brethren, but now we learn, from the report in a German contemporary of the Berlin Exhibition, that we have at last found our rivals in this particular branch of photography in our German brethren.

Waterproofing Dishes.—Although the recent introduction of enamelled steel dishes will, for large work at least, replace, to some extent, porcelain dishes, yet there may be some who wish to construct wooden dishes, and to render these and wooden sinks, &c., watertight, Hugo Müller recommends an indiarubber varnish made by melting two parts of common resin till fumes are given off, then adding one part of finely shredded indiarubber, not vulcanised, and stirring till it has dissolved. The vessel must now be taken from the fire, and two parts of linseed oil added, and stirred till it sets. It requires melting by a gentle heat before use, but will be found very efficient.

Elimination of Hypo.—Ommeganck suggests, as a hypo eliminator, a two per cent. solution of borax, which has no chemical action, but merely displaces the hypo. In the discussion upon Mr. Haddon's paper at the Convention a somewhat similar method was suggested by one of the speakers, and considerable doubt as to the efficacy of the treatment or the correctness of the reasoning was

expressed both by Mr. Bothamley and Mr. Haddon, and probably the latter has proved that water is the best hypo eliminator after all.

Magnetised X Rays.—One of the essential differences between the cathode rays and X rays is that the former are deflected by a magnet, whilst the latter are not. Lafay has, however, now shown that, if the X rays are passed through a silver leaf which is connected with the positive or negative pole of an electrical machine, the rays are sensitive to the magnet, and the reflection is different when the silver leaf is connected to the positive to what it is when it is connected to the negative.

Discovery of Platinum.—Some earths have been found at Refflinghausen, near Iserlohn in Prussia, which contain platinum, gold, and sulphur, but it is doubtful at present whether it will pay to work them, the necessary analyses of the yield of platinum and gold not being yet published.

A New Element.—M. Barrière, in his researches on monazite sand, from which most of the rare earths are obtained which are used for making the Welsbach mantles, has discovered what is considered to be a new element, which he has named Sucium, and which he proposes to use for the production of an incandescent gas light in opposition to the Welsbach, which is, of course, possible, as the existing patents could hardly cover an undiscovered element.

Two New Papers.—Two new papers have just been placed on the Continental market, the one a collodio-bromide, the other a baryta-albumen paper. This latter seems to be nothing more than the ordinary baryta papier coated with albumen and then sensitised. It is stated that the surface is much finer than with any ordinary albumen paper.

Yellowing of Platinotypes.—Ommeganck points out that the yellowing of platinotype prints is most probably due to traces of iron, which, notwithstanding treatment with hydrochloric acid, are very difficult to remove. He states that, if the prints are treated with a solution of ammonium tartrate and then well washed, the whole of the iron can then be removed. The ammonium tartrate solution can be prepared, adding sufficient ammonia to a five per cent. solution of tartaric acid to make it smell fairly strongly.

ROYAL PHOTOGRAPHIC SOCIETY.

President's Annual Address.

One of the labours of your President to which he does not look forward with any great amount of satisfaction is his Annual Address, more particularly when there is no particular epoch-marking advance either in photography or in the status of the Society. And yet an address of some kind has to be given. If we refer back to the past session, we can see nothing of any particular interest on which to discourse. Photography, like the financial wealth of the Empire, is making a steady progress. But there are no such leaps and bounds as once distinguished it. I am purposely excluding photography by the X rays as being anything belonging to an advance in photography. It is not a new photography, but the old kind, and its claim to novelty belongs more to electrical than photographic science. We may just as well talk of "new vision" as of "new photography." The Society has got its royal prefix to it, and its fellowships, which together have increased its popularity and added to its dignity, but beyond that it traces out its work in a strictly orthodox way. It flourishes, and much of its success is due to the energy shown by the Secretary and its Assistant Secretary, whose devotion to its work no one who has not seen what it entails can fully appreciate. But, even so, an annual address cannot well be written on their merits.

With this lack of ordinary topics for an address, I am forced to look elsewhere for material with which to fulfil my duty as President, and I have thought we might turn to some experimental facts which have been brought forward during the last two or three years, and endeavour to account for them theoretically. I am now alluding to the experiments which have been made by myself on the failure of what used to be accepted as a law in photography, viz., that, given a certain constant exposure consisting of time and intensity of light, the resulting chemical action would always be the same, no matter whether the intensity of light was small or great, if the time of its action varied in inverse proportion to its magnitude. And here let me point out a great difficulty that arises in expressing what one wishes to say; as I have already pointed out in a photographic periodical: Exposure may mean time and intensity, or it may mean time alone, and it is this double meaning to the term "exposure" which creates the difficulty. I have proposed that we should have a word to express time and intensity, and suggested that an exposure of a unit intensity for a unit of time should be called a Talbot.

This has, I think, in Bunsen and Roscoe's work, been called "Insolation," but the word is not satisfactory. I should prefer myself rather to unite the two initials of intensity and time and call it an It. For my purpose to-day, I shall adopt this provisional term: the precise unit of It not being necessary, I will not discuss it, though I think it ought to be referred to some wave-length in the spectrum of some optical value, whilst the unit of time would naturally be a second.

Coming to the experiments referred to, the first set which led to the others was the result that with intermittent exposures the same amount of chemical energy was not expended on a sensitive plate as did the same length but of unbroken exposure. The intermittent exposures always gave less chemical action. This, it appears to me, can be readily accounted for by picturing to ourselves the ultimate structure of the chemical compound. Supposing it to be silver bromide with which we are dealing, the ultimate arrangement would be a series of molecules consisting of at least two atoms of silver and two of bromine. We are apt, in thinking of a molecule, to picture the atoms as tied together with string, very much after the fashion that chemists show the supposed structure of more complex ones. We must, however, recollect that there are no bonds, strictly speaking, which tie the atoms together. They are held in their relative positions by mutual attractions, in space and not in a plane, and each one has a motion of its own, more or less simple. I have on several occasions taken the motion of a pendulum as a picture of the motion of an atom, and, as with the latter a series of regular synchronous impulses given to it will increase the swing, so also would they increase the extent of swing of the atoms, and that, when the impulses cease to act, they each will gradually fall back to rest. Owing to the fact that energy of radiation is always falling on the molecules, there is a swing of the atoms below which they will not drop until the temperature induced by it falls. We thus picture to ourselves at ordinary temperatures the atoms of silver and bromine vibrating amongst themselves, but never going beyond a certain boundary. If, however, we allow waves of light to fall on the molecule, the motion of the waves and that of the bromine atoms being in tune, or nearly so, the new impulses given will be sufficient to cause, at all events, one of the bromine atoms to pass the space where the attraction of the other atoms is omnipotent, and, particularly if there be another foreign molecule close at hand which will annex the atom, it will more readily pass from the mother molecule to the foreign one. The closer these two molecules are together, the more readily will the transfer be effected, and this may be the reason of the increase in sensitiveness induced by heating an emulsion or by other means. When the one atom of bromine is taken away from the molecule of silver bromide, the remaining three atoms, two of silver and one of bromine, have to rearrange themselves, and their position becomes more unstable. This idea clears the ground for the explanation of the results of the experiments alluded to. Suppose it takes a hundred wave impulses, one after another, in unbroken succession, to oust the bromine atom from the group. What would happen if we allowed between each impulse a time to elapse before another was applied? Say one impulse was given and then an interval of no impulse for the time during which ten more impulses would have been given. As the one impulse would not be sufficient to send the atom out of the molecule during that interval, the increased swing would gradually diminish, and the next impulse given it would have to start, not quite *de novo* perhaps, but it would not give the atom such an increased swing as it would have done had the two followed each other without intermission. Evidently, then, if we make the assumption indicated, the sum of a number of intermittent exposures ought not to give the same effect as a single exposure given for the same total time.

Let us now endeavour to account for the results of the experiments made with varying temperature of the sensitive salt. It was found that heat increased the sensitiveness, and that cold diminished it; that is to say, the chemical action was greater in the one case than in the other, as shown by the opacity of the deposit on development. We have already said that the atoms vibrate with a fixed amplitude or swing at a given temperature. Now, increase in temperature means an increase in molecular motion, and hence we may take it that the increased molecular motion means increased atomic swing as well. This being so, it is easy to see that, when the sensitive salt is heated, the impulses necessary to expel the bromine atom will be less than when the sensitive body is

colder. The limit of the sphere of attraction must be sooner reached in the one case than in the other. Apart from that, or rather as well as that if there be a foreign molecule present, its constituent atoms will also oscillate further from its centre, and, in the excursion of its atoms, the bromine atom will more quickly be annexed. This seems to me to be an explanation of the phenomena which were observed and measured.

We have been able to trace with a fair amount of ease the reason of the behaviour of sensitive material when heated, and also when the exposure is intermittent; but it is not quite so easy to account for the fact that the material in slow plates is less susceptible of chemical decomposition in feeble light, that is to say, that, "It" being kept constant throughout, a slow plate shows less energy expended on it when the light is feeble than when it is bright. We may suppose that a series of waves falls upon a particle, which is, of course, composed of an enormous number of molecules. Let us suppose that one wave is just sufficient to cause the swing of an atom of bromine to leave some one molecule when the light is fairly intense, then this molecule would be decomposed. We might suppose that with light of one-half the intensity two blows would be sufficient to cause the same expulsion of the atom. Let us look, however, a little closer into the matter. We do not know the exact motion of the atom, we only know that it swings rhythmically, and it by no means follows that the atom would be in that position of its swing that the energy of the second wave applied would increase the swing to the same amount as the first swing; or it might be that the same atom did not receive the blow at all. If either of these results took place, we can see that the two blows of half strength would not be as effective as one blow of full strength. Of course, in the most rapid exposures a large number of waves have time to travel across the path of the molecule, but the average blow in the two cases would follow the same reasoning. We are not, however, bound by this line of thought alone. We can take and annex to it that which Helmholtz followed when explaining mathematically the conditions necessary to explain anomalous dispersion. To arrive at a satisfactory conclusion of this phenomenen, he found it necessary to allot to the ether in which the wave motion of radiation takes place a certain amount of viscosity or resistance to motion when matter was in contact with it, although when by itself it was frictionless. If these free atomic swings be increased by the motion of the waves in the free ether, there would, nevertheless, be a retardation from the full effect owing to what we may call the inertia of the ether in contact with the atom being present. In fact, it might take a very large number of very small blows to perceptibly increase the swing, though the energy of the same concentrated into fewer blows might be sufficient for the purpose in view. But we have at the same time to account for precisely the reverse phenomenon being apparent when the intensity of the light is excessively strong, for in this case we find that the chemical action is less than it is when the same "It" is used with a less intense light. Thus the light of an electric spark at two feet distance from a plate causes much less chemical action than does the light of sixteen similar sparks when eight feet away from it. This appears to be directly contrary to the views just expressed. This may, however, be reconciled if the resistance to motion of the ether in contact with the atom increased as the energy of the wave increased. If we suppose that a comparatively heavy blow given to an atom will not give the full swing to it that it would take supposing there were no resistance, we can conceive that on a still heavier blow the resistance would be further increased (somewhat in the same way that atmospheric resistance to the passage of a body increases more rapidly than the impressed velocity increases), and the length of the swing would be proportionately curtailed. Thus, if an atom received two heavy blows, one double the energy of the other, it is possible that the blow of double energy would not increase the swing of the atom to the extent it would reach from the blows of the other. With feeble intensities the change in the factor of viscosity would not materially change, but, as the intensities increased, the alteration would become rapidly felt, as is the case with the atmospheric resistance. This being so, there would be, as I have already found, some one energy of wave which would have the greatest effect. The deviation from the maximum chemical effect caused by a constant "It," where the intensities are feeble, is found greatest in slow plates, whereas the deviation in the opposite direction, where the intensities of light are large, is much greater in a rapid plate. It follows from this that the maximum effective energy on a slow plate is when the intensity of light acting is great, and on a rapid plate when it is comparatively feeble. As our camera exposures made on the same subject may vary betwen $\frac{1}{100}$ of a second to five seconds, we have an ample margin for these different maxima to be practically taken into account. The rapid plate will give a less rapid gradation in a snap-shot picture on this account.

That some such action as that indicated must take place is borne out by the fact that there are exposures which apparently have no effect on the sensitive salt. The series of curves of gradation which have from time to time been published tell us this. At the place where the energy acting is small, the reduction of silver is below what it should be if there were no retardation of motion. Of course it must be borne in mind that the effect of development has been considered as giving the full value of the chemical decomposition. This may or may not be the case; but it will not affect the general argument. I am inclined to think that a close attention to the curves of gradation will enable a quantitative estimate of the condensation of the ether to be found, and, if so, it will be a valuable addition to molecular physics and the energy of radiation, for it must be recollected that the It is nothing more nor less than the energy of radiation lasting for a certain time.

This address has been one which has not followed the line of previous addresses, and I trust that I may be forgiven in breaking through the traditional review that is usually taken of the Society's proceedings.

Captain W. de W. Abney, C.B., R.E., F.R.S.

ARTISTIC ARCHITECTURAL PHOTOGRAPHY.*

[Photographic Scraps.]

I do not know whether the doors of the Photographic Salon would be opened to an architectural subject, however impressionistic its treatment; but, be that as it may, architectural photography, both interior and exterior, should afford the artistically minded photographer a wealth of picture-making material, and that, too, of a decidedly unconventional character. Architectural photographs, from the treatment which is usually accorded them, certainly partake more of the topographical than the artistic, but that such subjects are capable of a really pictorial rendering by means of photography cannot admit of doubt. Little, however, has yet been done in this direction. Will not some of our readers endeavour to make a name and fame for themselves by giving us, for example, a series of photographic *pictures* of our ruined cathedrals? In making this suggestion I do not in the least wish to be understood as giving utterance to an expression of opinion in any way adverse to the ordinary topographical architectural photograph, for such are not only of genuine interest, but of great educational value. I do, however, deplore the fact that, comparatively speaking, so few of our clever men—or rather of our artistically minded men (these cant phrases will obtrude themselves no matter how desirous one may be of avoiding them) have taken advantage of the opportunities which such subjects undoubtedly afford for really pictorial work.

Architectural subjects, notably cathedral interiors, have long been favourite subjects with painters, and their nature is such that wonderful effects of light, shade, and atmosphere are obtainable. Many of these effects should be within the power of photographers to reproduce. In this connexion it may be pointed out that the photographer is often at a disadvantage as compared with the painter, particularly in regard to the amount of subject included. In many paintings of interiors an angle of view is included by the artist which could never be embraced by the widest of wide-angle lenses, and, even were the optical difficulties surmounted, the violent perspective produced would quite destroy pictorial effect. In this respect the painter has a decided advantage over the photographer, for, by changing his point of view from time to time as each portion of his picture is painted, he is enabled to give us a result which, however untrue it may be from the point of view of geometrical perspective, yet succeeds in producing a pleasing impression on the mind of the observer. I only refer to this matter in order to direct attention to one of the limitations placed upon the photographer by his materials, and to show him that in the direction of angle of view he cannot hope to compete successfully with the painter. A wide-angled lens should rarely, if ever, be employed for architectural work when the aim is purely pictorial, and not merely topographical or technical, in which circumstances, of course, different considerations arise. Indeed, in many cases, a lens of decidedly long focus will often be found to be more useful, and will give a truer rendering, than the more commonly used wide-angle. Generally speaking a small angle of view will produce a more pleasing result from a pictorial point of view than the inclusion of a very large amount of subject. Indeed, the indiscriminate employment of wide-angle lenses has largely contributed to the disfavour with which architectural photographs are regarded by artists. In using a wide-angle lens, unless the greatest possible care is exercised (and sometimes all the care in the world will not avoid the evil), a very painful effect is produced by the undue dimensions given to objects in the foreground or near the camera, and the relatively insignificant appearance of those which are more distant. Although lenses of so wide an angle as 70° to 90° are frequently recommended, and used, for architectural work, I consider that such should only be employed in the greatest emergency, and that, as a general rule, an angle of 50° should not be exceeded. Indeed, in many cases, the angle may with advantage be considerably less even than this, and a lens giving an angle so small as 30° to 40° will often be found invaluable. The type of lens used does not much matter when the angle

* [We have seen an architectural photograph at the Salon.—Eds. B.J.P.]

included is small, so long as it well covers the plate; indeed for very narrow angles single lenses answer well. There is another advantage in using narrow-angle lenses in architectural work, in that such will usually cover very much larger plates, and thus they permit of the front of the camera being raised or lowered to a considerable extent without cutting off the corners, and enable the photographer to place the subject properly on the plate without tilting the camera or having recourse to the swing back.

In the short limits of the present article I cannot, of course, attempt to deal with all the many details of procedure pertaining to the practice of architectural photography, and I am only endeavouring to indicate how, by less conventional treatment of such subjects than is usually accorded them, results of a more pictorial character may be obtained.

Pictorial effect will depend to a large extent upon the selection of subject and point of view chosen, but here unfortunately it is difficult to convey useful advice, and the photographer must perforce be left to the guidance of his own innate artistic perceptions or instincts, and to whatever art training it may have been his good fortune to possess. I can, however, point out where, regarded from a purely artistic standpoint, architectural photography, however good technically, frequently signally fails, and that is in the general spotty appearance, the uneven distribution of light and shade without regard to massing, and the often painfully minute definition of the entire subject. The two important, nay essential points to bear in mind are, first: to avoid too much definition; and, second, to mass the light and shadow, and not permit your picture to be dotted chess-board fashion with confused patches of light and shade. In architectural photography it should not be difficult to follow this latter advice. Study your subject well before you attempt to make an exposure. Select your point of view, and then watch and study it at all times of the day and under varying conditions of light. Such a plan, to those to whom the suggestion may be new, will be found very helpful and educational, and much surprise will be felt at the widely different renderings of a particular subject which are obtainable at different times of the day. Strive for a broader treatment than is usually accorded to such subjects, study your lighting, and get your lights and shadows well massed. Avoid the use of small stops and consequent microscopic definition, and, above all, beware of the allurements of the wide-angle lens.

Speaking of definition, it is usually recommended, when taking architectural views, to use a very small stop and give a prolonged exposure. From the topographical point of view the advice, no doubt, is sound, but it is not by following such methods that success in the direction we are now considering is likely to reward our efforts. A full exposure it is always well to give, whatever the size of the stop employed, but with large apertures the inordinately long exposures sometimes necessary with small stops need not, of course, be given. *F*-11 or *f*-16 should afford sufficient, and more than sufficient, definition for pictorial effect, unless lenses of extremely long focus (and consequently small depth of definition) are used, in which case it may be necessary to further reduce the aperture. But even with large stops it will often be found that some portion of the picture is unduly sharp, in which case the simple expedient of printing through one or more thicknesses of celluloid will destroy the offensive wiry definition, and produce a softer and more pleasing result.

It must not, from the foregoing remarks, be inferred that I am an advocate of blurred, fuzzy, "out-of-focus" definition. In all cases the effect aimed at, and the nature of the subject must be one's guide, but, in ninety-nine cases out of a hundred, a better *pictorial* rendering will be secured by gently subduing the intense sharpness of the image produced by the lens. This may be done (without producing any "impressionistic" result) by the use of celluloid in printing; the amount of softness necessary must in every case be decided by the reader himself.

For architectural work of any kind, whether it be interior or exterior, the plates should be backed. Probably the most effective preparation for the purpose is the well-known mixture of caramel and burnt sienna, but, unless one has seen the mixture made by an expert, it is not quite easy to prepare it by merely following written or verbal instructions. A fairly effective substitute will be found in the moist water-colour tubes of yellow ochre procurable at the artist colourman's, or the ordinary moist yellow ochre of the oil shop, when mixed with a little glycerine and gum water, may be employed instead. The mixture should be applied to the back of the plates with a fairly large mop-shaped camel's-hair brush; the work can be very quickly done, it being by no means necessary to apply the paint smoothly, although care should be taken to leave no portion of the glass uncovered. If the plates are reared up against the wall of the dark room, backed side outwards, they will dry in a few minutes. Several dozen can in this way be backed and dried in the course of an hour. If they are to be carried about on tour, it is advisable to pack them in grooved boxes; if packed flat, pure paper must be placed between each film, to avoid the paint rubbing off and causing spots. In any case the plates should be well dusted before putting into the slides, and again before development.

By adopting this very simple plan of backing the plates, that great bugbear of the architectural photographer, halation, will be avoided, at any rate to a very large extent. Halation will also be reduced, though not prevented, by using films instead of plates. A film backed by the foregoing method gives very perfect results as regards absence of halation. Personally, for interior work of all kinds, I prefer an isochromatic plate of moderate rapidity to any ordinary plate. It has been stated that they rather favour halation than otherwise, but a very extended experience in their use, and a careful comparison of the results obtainable from them, and also upon ordinary plates exposed under similar conditions, lead me to take the opposite view. I therefore have no hesitation in advising their employment for all kinds of architectural work. A very striking illustration of their advantages occurred to me when engaged in photographing the ruins of Furness and Calder Abbeys a few years ago, both of which are built of the bright red sandstone characteristic of the district. On each occasion ordinary and isochromatic plates were employed, and in *every* instance the latter yielded an incomparably better result, *Verbum sapientum*.

JOHN A. HODGES, F.R.P.S.

PHOTOGRAPHIC COPYRIGHT UNION.

THE Annual General Meeting of the Photographic Copyright Union was held on Thursday, October 8, 1896, at St. James's Hall, Mr. Frank Bishop (President) in the chair. There were present, amongst others, Mr. Alfred Ellis, Mr. J. Lillie Mitchell (Hon. Secretary), Mr. H. Grove (Treasurer), Mr. Bulmer Howell, Mr. W. Downey, Mr. H. S. Mendelssohn, Mr. H. H. H. Cameron, Mr. T. Birtles, Mr. Warwick Brookes, Mr. Thomson, jun., Mr. F. G. O. Stuart, Mr. T. Bedding, Mr. Snowden Ward, &c.

The Chairman, having read letters and telegrams of regret from Mr. J. J. Elliott (Vice-President) and several others, spoke as follows:—

"According to the rules of our Association, we have to render an annual account of our proceedings during the last twelve months. I am pleased that this rule gives us an opportunity of meeting many of our members and others interested in copyright subjects. I think we may be fairly satisfied with our progress, though, for my part, I confess that our members are not numerous enough—we ought to number 2000—considering what we offer to members, I cannot conceive why we have not reached this figure, and can only put it down to misconception, or some want of perception as to the importance of our movement. As to misconception, I know there has been a general idea that the Union was formed solely for the protection of London interests. It is true that some London photographers, especially Mr. Elliott, Mr. Downey, and Mr. Ellis, were the first to move and to advocate the necessity of a copyright union, and through their exertions, and with the help of others, it was formed; but never with the idea of it becoming merely a London clique. I can testify that from the first the members of the committee have been most anxious that all provincial business should meet with great attention.

"Perhaps many here will be surprised to learn that, at present, four-fifths of the business done by the Union is for provincial members. I trust that from this time forth all photographers will believe that the Photographic Copyright Union is formed for, and works for, the interest of all, quite regardless whether the member resides in London or the provinces.

"There is another what I will venture to call misconception. It is with regard to our Rule 23. This rule states that no member shall allow any of his copyright photographs to be reproduced without a charge for the same of a sum not less than 10*s*. 6*d*. Now, there are many photographers to whom this rule is a stumbling-block; they say, if I were to adhere to this, I should lose my advertisements in the local papers, which my rivals, who don't charge, would get. Is this true? I think not. Your newspaper proprietor does not reproduce your view or your portrait to oblige any of you. He does it for his own interest, because he thinks the subject will be interesting to his readers and do credit to his paper. Does any one mean to say that 10*s*. 6*d*. is going to stop him from introducing an interesting subject? I can well imagine that the Rule 23 may be of considerable service sometimes, when begging friends wish to reproduce the photographer's property without paying. I am firmly convinced that Rule 23 operates, in the long run, entirely in the interest of the profession.

"With regard to the advantages offered by the Union:—

"1. Any member can write for guidance or information; and it must be borne in mind the advice tendered is from experts.

"2. Before litigation ensues the Union, through their solicitors, carefully examine all facts.

"3. In case of unsuccessful litigation, half the expenses are borne by the Union.

"4. The Union's forms as to assignment of copyright, also the permission to reproduce.

"Several cases have recently come under our notice, showing the necessity of using proper forms for permission to reproduce. If permission to reproduce on the payment of the fee be granted, and there are no restrictive clauses, the purchaser has the legal right to use it in various papers and many times over.

"Lastly, I would ask photographers to seriously reflect that the time for selling large numbers of silver prints from their negatives is past. The half-tone process, the collotype, and other mechanical processes step in to replace the silver or carbon print. Therefore, if the photographer be not careful to protect himself, the fruits of his labour will be taken from him. On the other hand, if he registers his copyrights, he will find, mainly through the action of our Union, he has a valuable asset. The ever-increasing use of reproductions from photography ought to be a

source of income, and some compensation for loss of business in other ways."

At the conclusion the President called on the Hon. Secretary to read the Committee's report, the adoption of which was moved by Mr. H. H. H. Cameron and seconded by Mr. Mendelssohn, and carried without dissent.

COMMITTEE'S REPORT.

To the members of the Photographic Copyright Union:

In presenting their second annual report at the expiration of the third year of their existence, your Committee feel that they have good reason to congratulate the members on the successful progress of the Union, on the remarkable ease with which the business of the Union has progressed during the current year, and on the absence of anything like important litigation in the maintenance of its principles, which it is gratifying to report are now almost universally recognised by the users of photographic copyrights.

It will be in your remembrance that at the last General Meeting certain rules were amended, in particular that relating to the membership fees, which were then abolished. So far the Committee are satisfied that this decision was a wise one, as the membership has considerably increased, and the voluntary donations show a satisfactory result.

From the Secretary's diary of correspondence and replies thereto the Committee are pleased to observe that by far the larger number of letters are from provincial members, and, as showing the general interest taken in the Copyright Union, the Secretary reports communications as to membership having been received from America, France, Germany, India, South Africa, and other parts of the world.

So great has been the increase in the business that your Committee, whilst making provision for the daily attention to important letters, have found it necessary to meet regularly once a month, instead of quarterly as formerly.

The financial position of the Union is satisfactory. All debts have been paid, there is a small working balance, and the reserve fund remains intact.

In accordance with Rule 9, the two members of the Committee who have retired by rotation and ballot are Mr. Alfred Ellis and Mr. J. Lillie Mitchell. These gentlemen offer themselves for re-election.

(For the Committee) HENRY GOWER,
Secretary.

TREASURER'S REPORT.

The following statement of accounts has been submitted to the Committee and meets with their approval:—

DONATION FUND.

Year ending September 30, 1896.

Dr.	*Receipts.*	£	*s.*	*d.*
To Balance of cash in hand as per last account		3	15	11
,, Donations received during year		196	9	6
,, Registration fees received and forms sold...		8	7	0
		£208	12	5

Cr.	*Expenditure.*	£	*s.*	*d.*
By Secretary's salary (November to August inclusive)		30	0	0
,, Solicitor's charges and Counsel's fees		36	5	11
,, Stationery and printing		23	4	4
,, Postages		11	7	3
,, Advertisements		10	18	6
Subscription to London Chamber of Commerce...		10	10	0
Cash at bankers'		85	11	5
Cash in hand		0	15	0
		£208	12	5

(Signed) WM. GROVE, *Treasurer.*

Audited and found correct. (Signed) H. H. H. CAMERON,
October 9, 1896. THOMAS BEDDINO.

The reserve fund remains intact, and has been increased by the sum of 16*l.* 14*s.* 10*d.*, received as proportion of fees recovered by solicitors.

Some conversation and discussion having taken place on a question raised by Mr. Mackie, Mr. Mendelssohn moved, and Mr. Cameron seconded, that Mr. Alfred Ellis and Mr. J. Lillie Mitchell be re-elected on the Committee, they having retired by rotation and ballot.

The Chairman having spoken as to the importance of these two gentlemen being re-elected, it being most desirable in the interests of the Union, the vote was put to the meeting, and carried unanimously.

It was felt desirable by the Committee that their number should be added to so as to more fully represent the provincial photographers.

Mr. Winter (Mawson & Swan's) moved, and Mr. Thomson, junr. (London) seconded—that Mr. F. M. Sutcliffe, of Whitby, and Mr. McGrath (of Grey & Co.), Cork and Limerick, be elected. This was put to the meeting and carried unanimously.

Mr. A. Ellis proposed a further addition—that Mr. Warwick Brooks (Manchester) be added to the Committee. Mr. T. Birtles (Warrington), having seconded this, it was also carried unanimously.

Mr. H. S Mendelssohn suggested that every President of local Photographic Societies in the provinces, should be asked to join the Committee. This, the Chairman promised, should have the consideration of the Committee.

Mr. Warwick Brooks thought it would be an advantage if the Annual Meeting of the Union was held in close proximity to the Meeting of the National Association of Professional Photographers, and the opening of the Royal Photographic Society's Exhibition. This, it was promised, should be observed next year.

The Treasurer was called upon to read his report as above—the adoption of which was moved by Mr. H. N. King, and seconded by Mr. Caswell Smith (London), and carried unanimously.

The Chairman moved a vote of thanks to the London Illustrated press, who had treated photographers in a fair way by paying a fair amount for value received. Mr. H. S. Mendelssohn seconded, and it was carried unanimously.

Mr. Alfred Ellis moved, and Mr. Thomson, jun., seconded, a vote of thanks to the photographic press—and which was supported by the Chairman—for what they had done in furthering the principles of the Union. This was carried.

Mr. Bedding replied to this vote of thanks, and, in the course of his remarks, refuted the statement made by some, that the Union worked for the benefit of a few London photographers. His position, as an auditor of the Union, gave him opportunities of seeing that London photographers were the least to profit, financially, through the Union.

Mr. Snowden Ward, in the course of his remarks, thought that Rule 23 was a mistake, and stated that it was impossible for him as a photographer (not as a journalist), owing to this rule, to become a member, but thought those outside should give their moral support to the Union.

The Chairman moved that a vote of thanks be passed to the Auditors for their work during the past two years, and thought the best way of showing appreciation of their services was to ask them to serve for another year. This was seconded by Mr. Mendelssohn, and carried unanimously.

A vote of thanks to the Chairman, as President of the Union, and also to all the Committee, was moved and carried unanimously, for the interest and work they had done to further the interests of the photographers in their copyright rights.

BRIXTON AND CLAPHAM CAMERA CLUB EXHIBITION.

THE Sixth Annual Exhibition of the Brixton and Clapham Camera Club was held last week, and was unquestionably the best we have seen promoted by this flourishing South London association, which includes among its members some of the foremost workers of the day.

The Judges were Messrs. Cembrano, Gale, and Wall, and they gave their awards as follows:—

Class A (Prints by Members).—Silver medal for best collective exhibit (Nos. 1–18), John Gunston; bronze medal for collective exhibit (Nos. 86–93), G. W. Welham; bronze medal for No. 104, C. F. Archer; bronze medal for No. 34, F. W. Levett.

Class B (Junior Members' Work).—Bronze medal for No. 153, L. E. Cotterell.

Class C (Lantern Slides by Members).—Bronze medal, John Gunston.

Class D (Prints—Open Competition).—Bronze medal for No. 225, A. J. Jeffreys.

Class E (Lantern Slides—Open Competition).—Silver medal for No. 316, E. Dockree; bronze medal for No. 305, A. Brooker.

Pressure on our space obliges us to be very brief in referring to the Exhibition, but we may say that, in addition to the medalled work, great credit, in our opinion, was due to the productions of Mr. W. H. Whittard, who, in Class A, showed some cleverly rendered figure studies. Some excellent landscape work, by Mr. C. F. Archer and Mr. A. Whittaker, and architectural interiors, by Mr. F. P. Smith, also attracted our attention. In Class D Mr. E. C. Hertslet ran the successful exhibitor, Mr. Jeffreys, close with a beautiful view, *Tranquil Rye*, and a composition study, *Waiting for Father's Return*. Mr. P. S. Lankester had a charming portrait study and a study of a head, a line of work in which he excels, which were certainly the best of the kind exhibited. A loan collection included choice examples by past conquerors at this Exhibition—Mr. E. Dockree and Mr. Thomas.

Animated photographs were shown by Messrs. Banks & Greaves each evening, and there was an exhibition of apparatus by the Prosser Roberts Company, Messrs. Beck, and other firms, as well as demonstrations of radiography.

A PATENT COURT.

FOR long past we have experienced a growing conviction that there should be a special court for the trial of actions affecting the validity of patents and the rights of inventors. That conviction strengthened as it grew, says our contemporary *Invention*, and has at length become a settled one—a fixed and unalterable opinion. This opinion is the outcome of a somewhat lengthy experience of patent cases in connexion with expert evidence, and is based upon personal observation of the unmistakable, though unexpressed, views entertained by some of the Judges

before whom we have had to appear. We have more than once noted the anxiety depicted upon the face of a Judge in his earnest endeavour to grasp the details of some involved and complex mechanical or chemical question; and we have also seen the look of relief when the hour of adjournment arrived. We have, moreover, listened to judgments which have passed over several important technical considerations and steered clear of the common-sense aspect of the case. Not that common-sense should always, or even generally, guide or influence a decision; but it may occasionally prove a useful factor in a judgment. On the other hand, a common-sense view may sometimes be neglected with advantage. In a case in which we were recently engaged, and which involved a close legal argument, Counsel, when his armoury had been depleted, appealed to the Judge on the ground of common sense. His Lordship remarked that he had often heard common sense appealed to as a last resource of defeated argument.

But to return. The inadequacy of some Judges to deal equally well with others with abstruse technical questions arises from an unavoidable want of sympathy on their part with the subject. This sympathy, while it is absent from some minds, is present in others in a marked degree, and enables them to readily assimilate that mental pabulum which to others is very difficult of digestion. Some will almost instinctively apprehend that which others comprehend but slowly. This inadequacy is not the fault of the Judge, but his misfortune. His judicial duties oblige him to undertake a task which the natural constitution of his mind renders, in certain respects, difficult of performance because of its uncongeniality. Professional training has somewhat to answer for in this connexion. That of one Judge may have differed from that of another in that, for want of inclination, or, in other words, of natural aptitude, his studies have not included subjects which would enable him to regard scientific cases or to construe a patent specification otherwise than from a purely legal point of view. The unfamiliarity of some of our most eminent Judges with technical matters is not infrequently exhibited in court. We well remember how upon one occasion, at the close of an hour's cross-examination by an eminent Q.C., we were asked by the Judge to explain a simple mechanical principle about which we had been contending with the Q.C., and upon which the case mainly hung; on the other hand, with what avidity and evident zest some of our Judges tackle the most difficult cases! Those are they whose minds are in thorough sympathy with scientific subjects, and who take up point after point with the readiness and familiarity of a practised expert, sometimes to the discomfiture of counsel and witness.

GLASS SUBSTITUTES IN GERMANY.

There are several substitutes for glass in use in Germany, the chief among them being tectorium, *fensterpappe*, and *hornglas*. Tectorium is a sheet of tough, insoluble gum—said to be bichromated gelatine—about one-sixteenth of an inch in thickness, overlying on both sides a web or network of galvanised iron or steel wire, the meshes of which are generally about one-eighth of an inch square. The United States Consul-General at Frankfort says that both surfaces of the tectorium in ordinary use are apparently covered with a varnish of boiled linseed oil, and it feels and smells similar to the oiled silk that is used in surgery and for sweat bands in summer hats. It is lighter than glass of equal thickness, is tough, pliant, and practically indestructible by exposure to rain, wind, hail, or any shock or blow which does not pierce or break the wire web by a violent thrust. It may be bent in any desired form, and fastened in position by crimping, nailing, or with putty like ordinary glass, and when punctured it may be easily repaired. Its translucence is about the same as that of opal glass; its colour a greenish amber yellow, which fades gradually to white from exposure to the sun, so that, while arresting the direct rays of sunshine, it transmits a soft, modulated light, which is said to be well adapted to hot-houses and conservatories. It is a poor conductor of heat and cold, and thus preserves a more equable temperature than glass in rooms containing growing plants. Its surface is well adapted for painting in oil colours, and it is used for illuminated windows, signs, and transparencies, in which strength, lightness, and immunity from breakage are essential, especially in arched, curved, or irregular surfaces. The only objections that can be urged against tectorium are that it is more or less inflammable, and that in very warm weather the outside surface is sometimes softened until dust will adhere to it, but this may be removed by wiping or washing, a service that is usually performed by the rain in exposed situations. Tectorium is an English invention, and Consul-General Mason says that, as far as can be ascertained, it is not patented in Germany. It is claimed for it that it has effected an important economy through its immunity from breakage, which, in case of large roofs of glass, are so frequent and so expensive to repair. For ordinary hotbeds and forcing houses, such as are used by most florists and market gardeners, the Germans have another and cheaper substitute for glass in the so-called *fensterpappe*, which is a tough, strong manila paper, that may be stretched on large sashes or frames, and saturated by painting the exposed surface with boiled linseed oil until it becomes translucent and impervious to water. The paper costs wholesale in Germany about 19*s*. 10*d*. per roll, 100 metres in length by one metre in width, equal to 1220 square feet in each roll. There is no difficulty or secret about its preparation or use. Light wooden frames about forty inches in width, and of any desired length, are provided, and covered with the paper, which is fastened by nailing at the edges, and then painted with ordinary boiled linsed oil, until the paper is so saturated that the last coat of oil forms a smooth, glistening surface like varnish. As soon as dry, the frame is ready for use. It admits sufficient light for growing plants, does not require to be shaded in hot sunshine, is light, durable, secure against breakage by hail or ordinary accident, and, taking everything into account, is said to be about one hundred times cheaper than glass. It is largely used by florists and market gardeners in the district of Frankfort, and their general verdict is strongly in its favour, although for handsome conservatories, skylights, &c., it possesses less durability, and none of the neatness and elegance of tectorium. Finally, there is a new product, called *hornglas*, which has been recently patented and placed on the German market. *Hornglas* resembles tectorium in appearance, with the difference that it is thinner, and consequently lighter in weight, and the insoluble gelatine with which the wire gauze is covered is whiter, and more nearly transparent, than tectorium, although it may be coloured red, green, blue, or any other tint that may be desired for special purposes. It is manufactured in two qualities, one being of heavier wire and with larger meshes than the other. It is cut into lengths of about twenty-three feet by forty-seven inches in width, and is sold wholesale for about 5*s*. 4*d*. per square metre, or rather more than 5*d*. per square foot. The special advantage claimed for *hornglas* is that it does not soften under sun heat, and is therefore adapted to use in any climate without the danger of becoming so soft and adhesive as to retain dust and dirt. Its uses and general characteristics are similar to those of tectorium.

A PHOTOGRAPHER SUMMONED FOR INFRINGING BUILDING BY-LAWS.

At the Portsmouth Police-court, on October 5, before Mr. T. Cousins and Captain Bamber, Ernest Charles Hopkins, of 23, Landport-terrace, Southsea, a photographer, was summoned by the Corporation for unlawfully, and without the written consent of the Urban Sanitary Authority of the borough, erecting a wooden building, with glass front and sides, beyond the front main wall of his residence in Landport-terrace, and continuing the offence from June 10 to September 22, although he had received notice to pull down and remove the same.—Mr. G. H. King prosecuted on behalf of the Authority, and Mr. Bell, of Southampton, appeared for the defendant.

Defendant was previously summoned for the same offence, and the information had then been dismissed on technical grounds.

Mr. W. Coish, Private Improvement Clerk to the Portsmouth Corporation, produced the notice from the Urban Authority, a copy of which he had served on defendant. He also produced a resolution passed by the Roads and Works Committee on May 4, to the effect that notice should be served on defendant to move the structure. This resolution was confirmed by the Town Council on June 9.

Mr. Bell: That is exactly sixteen days after the service of the summons.

Mr. Philip Murch, Borough Engineer, was called. He said he had not closely examined the structure in question, but he had seen it. It was built of wood and glass, and stood in the garden in front of defendant's house. It was used by defendant for the exposure of photographs.

Mr. Bell: Do you produce any written resolution authorising you to serve any notice upon defendant? Witness: No.

Mr. Richard James Jenkins, building and house drainage surveyor, employed by the Corporation, said that he had examined the structure in question. It stood upon wheels, which ran on rails, and could be moved backwards and forwards about three feet six inches. The erection was first made on April 2, and was still standing.

A minute detailing the duties of the Borough Surveyor was produced, in which it was stated that the officer should perform all duties necessary for the proper carrying out of the provisions of the Public Health Act.

Mr. Bell submitted that he had no case to answer. His objection to the proceedings was that the notice, which was the foundation on which the proceedings must stand or fall, was a bad notice. The notice under which the information was laid stated that any person offending against the enactment would be liable after written notice from the Urban Authority. The evidence with reference to the notice was that a Committee had passed a resolution to the effect that such a notice should be served, and that resolution had to be confirmed by the Town Council. The Committee had done very foolishly in serving the notice on May 23, when the Council did not confirm their resolution until June 9. A second point was that there was no evidence before the Court that defendant erected the building in question. Further, Mr. Bell contended that the erection was not a building, but merely a box on wheels, which could be conveyed to any part of the town or the world.

The Court decided, as a matter of fact, that defendant did erect the building in question.

After a lengthy consultation in private, the magistrates decided that the erection in question was a building, and was a very flagrant violation of the statute, and must be a great nuisance to people living in the neighbourhood. They inflicted a fine of 2*s*. 6*d*. for each of the 102 days the erection remained after service of the notice, amounting in all to 12*l*. 15*s*.,

and costs 9*s.* 6*d.* They had power to alter the penalty during the sitting of the Court, and, if defendant was prepared to have the building removed within a reasonable time, they were prepared to reconsider their decision as to the amount of the penalty.

Mr. Bell, on behalf of defendant, agreed to remove the structure within seven days and to accept the magistrates' judgment, and the penalty was thereupon reduced to 2*l.* 11*s.* (sixpence a day). Defendant was not called upon to pay costs.

The Inquirer.

**** *In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

COLOURED TRANSPARENCIES BY DEVELOPMENT.—C. H. PRICE inquires for a method of making, by development, transparencies (separate) in sepia, blue and green colours.—Perhaps some reader can supply the desired information.

STUDIO ARCHITECTS.—N. P. says: "Could you inform me of an architect who makes photographic studios a speciality? I am building a new one, and should like to have expert advice, and also learn the name of designer specially qualified for the work."—Perhaps some reader can supply the desired information.

RETOUCHING SURFACE (To "Japhet").—COUNTRY PROFESSIONAL writes: "I do not know exactly how much lead you want to get on to the negative; but, if you cannot get enough by careful variation of the formula I gave, it is certainly not the right one for you. Perhaps, if you dust the surface, while wet, with flour emery, it might give a sufficient 'tooth' to suit your touch."

SPIRIT LEVEL DEFECTIVE.—W. J. C. says: "I have one of the circular spirit levels ordinarily employed for levelling the camera out of doors; but it is of very little use, as, owing to leakage, the bead or bubble occupies more than half the area of the circle. The liquid is introduced by means of an aperture on the under side, closed by a screw which, after considerable trouble, I succeeded in removing; but I have entirely failed in all my attempts to get any more liquid into the level. Can any of your readers help me? What is the proper liquid to employ? Alcohol, I believe."

MAGNESIUM FLASH PAPER.—P. STOW says: "In the JOURNAL for May 8 last there is a note, on p. 291, on magnesium flash paper. I have tried to make it, but failed to get any satisfactory result. Could you give me any further particulars, I should be much obliged. I used plain thin white paper, soaking it in a saturated solution of potassium chlorate, and drying when it appeared to be covered in small crystals; is this the best way? I don't know how much powder to put on, but in my experiment I sprayed as much as the paste would hold on when the paper was held perpendicularly. My result simply crackled with an occasional small flare of magnesium."—Perhaps some reader could supply the desired information.

DAMAGED SURFACE OF NEGATIVES.—ALUM says: "In going over a number of negatives taken during the past summer, previous to packing them away, I find several of them suffering from a sort of crystalline surface marking, which I attribute to imperfect washing after using the alum bath. These particular negatives were all taken at a time when I was more than usually busy, and, though they showed no sign of the defect when newly dried, there is little doubt the washing has been 'scamped.' The question now is, Can the markings be removed? I have soaked one of them in water for an hour, but, though on redrying some crystalline matter appears to have been removed, the markings remain. Can I do anything more?"

PURE WATER.—W. FINLAY writes: "Allow me to thank W. C. Holmes for his description of a cheap filter. I have made an experimental one, and it seems to work most efficiently; but the water, when filtered, although beautifully clear and perfectly colourless, has a decidedly 'tarry' or 'burnt' taste, which, I assume, comes from the charcoal. Is this as it should be, and will it pass off in course of time? The material used is animal charcoal, freshly burnt, which may possibly account for the taste." Another correspondent, J. E. JOHNSON, writing on the same subject, says: "I have tried W. C. Holmes's cheap filter, which seems to be all right in theory, if you can only get proper sand. He speaks of 'well-washed silver sand.' I have taken silver sand as obtained from the oil shop and soaked and washed it for a day, and still the water comes through like the drainage of a gravel pit, in fact a good deal worse than it goes in. How long should it take to well wash a peck of sand?"

BISULPHITE OF SODA.—ECONOMY writes: "I have a quantity of bisulphite of soda which I wish to utilise for developing purposes. I have employed it in solution, instead of the neutral sulphite, and, as a matter of course, it forms a much better preservative, especially in the case of pyro; but the excess of acid I find very confusing when adding the alkali for development. Of course, under normal conditions, it is easy to know what quantity of alkali to add; but, if the proportions have to be altered for either under or over-exposure, a somewhat elaborate calculation is needful. I wish, therefore, to convert the acid into the neutral sulphite, but cannot tell how much carbonate or hydrate of soda to add to bring about the exact conversion. In separate small quantities, operated upon experimentally, the quantities of alkali used vary so widely that I think something must be wrong, and I find it very difficult with litmus as the indicator to judge the colour. Will any one give me the relative proportions of bisulphite and alkali?"

SPOTTING PRINTS AND NEGATIVES.—COLOURIST writes: "With regard to this question, 'Spotter' is quite right in saying that proper materials are an essential to success, and this is especially the case in the matter of the medium. I have for years past adopted the following plan, and, although it entails some little trouble at the start, it is well repaid, and a small quantity of the preparation will last a long time. In spotting or retouching (with the brush) negatives, I take any quantity of old negative film, removed from the glass and boiled in a porcelain or earthenware jar with a little dilute acetic acid, until reduced to a permanent liquid state. I do not find any need to do anything more to this preparation beyond simply evaporating it to a suitable consistency, in which condition it keeps ready for immediate use for any period; should it exhibit a tendency to dry up, however, a little glycerine may be added. For prints, I take the trimmings and clippings of toned gelatino-chloride prints and treat them in the same way, only omitting the acetic acid. The trimmings are boiled in water until all the gelatine and silver are dissolved off, the paper is then removed and the liquid concentrated as before. The colour of the deposited matter will be much redder than that of the prints operated upon, but it may be considerably modified, in fact brought to any desired tone, either by intentionally over-toning a portion of the cuttings, or by treating the deposit obtained with a little chloride of gold while boiling."

Our Editorial Table.

THE COOKE LENS.

MESSRS. TAYLOR, TAYLOR, & HOBSON, of Slate-street Works, Leicester, send us a neatly got-up booklet, which is devoted to briefly describing the defects of curvature of field and astigmatism in lenses, and the influence of those aberrations on the character of the image. Lenses so characterised are compared with others of modern construction, of which the Cooke is taken as a type. We are asked to recommend the pamphlet to our readers, and have pleasure in doing so.

FIRST AID IN PHOTOGRAPHY.

By J. R. COURTENAY GALE and J. CADETT. Ashtead: Cadett & Neall.

THIS, a beginner's book, is No. 1 of the Cadett Photographic Handbooks, and is perhaps more like a photographic Mavor than any other elementary book we have seen. It appeals to the aspirant who knows nothing of photography. Persons of this kind are hard to write for, on account of the difficulty of authors to let themselves down to the level required. In this task Messrs. Gale & Cadett have succeeded very well, and the book is a collection of tersely expressed instructions in elementary photography, through which the ignoramus may pass to a very fair knowledge of his subject. It includes a celluloid negative and sells at 1*s.*

ECCLESIASTICAL BUILDINGS IN SHREWSBURY.

Shrewsbury: Adnitt & Naunton.

THERE were very few visitors to the Shrewsbury Convention who did not avail themselves of the excellent photographic guide to the

town issued by Messrs. Adnitt & Naunton, of the Square, Shrewsbury. The same firm also issued an excellent album of collotype views—"Picturesque Shrewsbury"—which was greatly appreciated. "Ecclesiastical Buildings in Shrewsbury" is the latest pictorial publication of the firm, who took advantage of the Church Congress, a fortnight ago, to issue the volume. It is an elegantly got-up album, full of capital photographs of the Shrewsbury churches by Mr. W. W. Naunton, who is personally known to many of our readers. The volume sells at 2*s.*, and it is one that possibly many who read this paragraph will be glad to possess. It will appeal to them, as it does to us, as another reminder of the memorable Shrewsbury Convention.

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—Photo-mechanical meeting, Tuesday, October 20, at the Gallery, 5A, Pall Mall East, at eight p.m. *Half-tone Direct from Nature*, by Mr. William Gamble.

PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, October 21. Members' Open Night.

THE BRISTOL EXHIBITION.—Messrs. Bernard Alfieri, Valentine Blanchard, Payne Jennings, H. A. Hood Daniel, and Reginald Smith have kindly consented to act as Judges at the Bristol Exhibition, to be opened in December.

ERRATUM.—By a typographical error we were made last week to say that the British Photo-print Company, of 22, Southampton-buildings, Chancery-lane, had purchased the business of the Richmond College Company. For "College" read "Collotype."

THINGS THEY MANAGE BETTER IN AMERICA.—The late Dr. Brown Goode made the following comparison in a report of the United States National Museum: "There is not a department of the British Government to which a citizen has a right to apply for information upon a scientific question. This seems hard to believe, for I cannot think of any scientific subject regarding which a letter, if addressed to the scientific bureaux in Washington, would not receive a full and practical reply. It is estimated that not less than 20,000 such letters are received each year. The Smithsonian Institution and National Museum alone receive about 6000, and the proportion of these from the new States and Territories which have not yet developed institutions of learning of their own is the largest. An intelligent question from a farmer of the frontier receives as much attention as a communication from a royal academy of sciences, and often takes more time for the preparation of the reply."

ROBERT LOUIS STEVENSON AS A DRAUGHTSMAN.—A special winter number of the *Studio* will shortly appear, in which will be published for the first time an account by the late Robert Louis Stevenson of his stay at Monastier in the autumn of 1878. This article was originally intended to serve as the opening chapter of his well-known volume, *Travels with a Donkey in the Cevennes*, but the intention was abandoned in favour of a more abrupt beginning. The story will be illustrated with sketches by the author which have never previously been published, while reproductions will also be given of the humorous woodcuts executed by Stevenson and printed by his young stepson, Lloyd Osbourne, at Davos, in the Engadine, during the winter of 1880–81. This number will also contain "The Ideal Life of a Landscape Painter," by James Stanley Little; "Some Famous Paris Studios," by Gabriel Mourey; an article upon Old Samplers, by Gleeson White; and contributions from the pens of Joseph Pennell, Norman Garstin, Margaret Armour, and others. A sketch in colours by G. H. Boughton, R.A., will be included among the supplemental illustrations.

SYMPSYCHOGRAPHY is a portentous word, and so it should be to sum up worthily the phenomena with which it is concerned. The world knows something already of the remarkable photographic experiences of Mr. Ingles Rogers, who professes to have obtained pictorial images of certain mental processes. Mr. Rogers alleged that, after contemplating fixedly for a time so simple a work of art as a British postage stamp, he then placed himself before the lens of a camera in a dark room, and was rewarded by finding that the sensitised plate reproduced a shadowy portrait of our gracious Sovereign, with the words "One penny" on the rim. Mr. D. S. Jordan, however, a gentleman holding a distinguished university position on the other side of the Atlantic, has now contrived to go one better than his predecessor in this branch of occult science. He gets together six persons of suitable capacity, and bids them concentrate their minds upon the harmless, necessary cat—in the abstract, of course—without reference to any individual of the species. Each then projects this mental image into a separate lens, all the invisible rays being focussed upon a single plate, and the result is a representation of the ideal cat. Mr. Jordan hopes very soon to be able to reverse the process, and to extract from the feline brain a true picture of the ideal man. But here a difficulty comes in, the cat may refuse to take the matter seriously, and may laugh at the philosopher.—*Daily Chronicle.*

AN INJURY WITHOUT A REMEDY.—At the Sheffield County Court on Friday, the 2nd instant, an interesting action was tried involving a question as to the person liable for damage to a parcel of photographic plates sent by passenger train. The plaintiff in the case was Frank Mottershaw, trading as the Sheffield Photographic Company at Norfolk-street, Sheffield, and the claim was for 10*s.* 9*d.* for goods sold (photographic plates) by him to Mr. F. Whaley, the well-known photographer and artist at Doncaster, who resisted the claim on the ground that, upon receipt of the goods, the plates were broken into hundreds of pieces, and that such breakage was caused by the negligence of Mottershaw, firstly, in not affixing a board on the top as well as underneath the plates, and, secondly, in not labelling the parcel, which was sent by a passenger train from Sheffield to Worksop, "Glass" in the usual way in the trade of these kind of goods. Plaintiff had absolutely refused to make the damage good by supplying others in the place of the damaged plates, and the defendant was unable to obtain compensation from the railway company in consequence of Mottershaw omitting to label the parcel "Glass." After the evidence was taken, and the legal argument on both sides heard, the Judge considered an important point was raised in the case, and, although he gave judgment for the amount claimed, he gave Mr. Whaley leave to commence an action for damages against Mottershaw or the railway company for the breakage as he may be advised, he (Mr. Whaley) having received nothing of any value for his money.

THE Hackney Photographic Society's Annual Exhibition will be held at Morley Hall, Triangle, Mare-street, Hackney, on Tuesday, Wednesday, Thursday, and Friday, November 17, 18, 19, and 20, 1896. The Exhibition will be opened on November 17, at half-past seven, the succeeding days at twelve (noon) till ten p.m. The prices of admission each day will be, between twelve and six, 6*d.*, afterwards, 1*s.*; and arrangements will be made for continued instrumental concerts of a high-class character, lantern displays, &c. The Judges are Mr. F. Hollyer, the Rev. F. C. Lambert, and Mr. E. J. Wall. The Hanging Judge is Mr. Alexander Mackie. The classes are: (Members') Class A, Any picture taken since last Exhibition; Class B, Pictures taken during Membership; Class C, Best Picture taken in Hand Camera (enlargements permitted); Class D, Stereoscopic, set of six (prints or transparencies); Class E, Set of four slides; Special Class for greatest novelty, home-made or otherwise. The Open Classes are (entries in these classes may be priced for sale at the option of the exhibitor): Class F, For any picture not previously having received an award; Class G, For Portraiture and *Genre* (in this class the work may be that of a firm, and need not be that of the exhibitor alone); Class H, Champion Class, for pictures which *have* previously received awards; Class I, For four Lantern Slides *not* having previously received awards. Awards (Members'): Classes A, B, C, D, and E, silver and bronze medals in each; Members' Novelty Class, silver medal; for best picture in Members' Classes, gold medal, presented by F. Houghton, Esq. The medals in Classes C and E are presented by L. S. Wilks, Esq., and Major Woolmer-Williams respectively. The President (Mr. Bedding) has also notified his intention of presenting a special prize in Class D. Open Classes: Classes F, G, and I, silver and bronze medals in each; Champion Class, gold and silver medals; Trade Section, silver medal. Certificates will be awarded at Judges' discretion. Extra entry forms and all further information respecting Exhibition can be obtained from W. Fenton-Jones, Hon. Secretary, 12, King Edward-road, Hackney, N.E.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
19	Bradford	*Church Notes from Various Counties.* S. Margerison.
19	Camera Club	*Transparency of Glass and Porcelain to the X Rays.* Professor A. W. Rücker.
19	North Middlesex	*The Silver Sensitising Bath.* W. J. Simpson.
19	Richmond	*At Home Subjects.* W. Thomas, F.R.P.S.
20	Birmingham Photo. Society	*Westminster Abbey: its Monuments and Historical Associations.* Sir J. Benjamin Stone, M.P.
20	Brixton and Clapham	*Pictorial Photography.* A. Horsley Hinton.
20	Gospel Oak	Developing, Toning, and Mounting.
20	Hackney	*Intensification and Reduction.* E. J. Wall.
20	Leeds Photo. Society	*Elementary Lantern Manipulation for Beginners.* S. A. Warburton.—Lantern Slides on Sandell Plates from J. T. Sandell.
20	Lewisham	Lantern Evening.
20	Royal Photographic Society	*Half-tone Direct from Nature.* William Gamble.
21	Croydon Camera Club	*At Home Photography.* W. Thomas, F.R.P.S.
21	Leeds Camera Club	*Lantern-slide Making.* J. A. Hodges.
21	Leytonstone	*A Tour in Wales.* G. U. Haslam.
21	Photographic Club	Members' Open Night.
22	Ashton-under-Lyne	*Print Enamelling.* Samuel Woolley.
22	Camera Club	*The Chemistry of some of the more Common Processes of Photography.* H. C. L. Bloxam, F.C.S., &c.
22	Ireland	Practical Demonstration in Enlarging by R. M. Inglis.
22	Liverpool Amateur	*The Art of Sculpture, with Practical Demonstrations from Photographs.* George Holding.
22	Nottingham	Annual Meeting.
22	West Surrey	Discussion: *What is the Best Camera for Beginners?*
23	Croydon Microscopical	Trial Night, Members' Slides.
24	Leytonstone	Open Social Meeting.

ROYAL PHOTOGRAPHIC SOCIETY.

OCTOBER 13,—Ordinary Meeting,—Captain W. de W. Abney, C.B., R.E., F.R.S. (President), in the chair.

THE LATE MR. WILLIAM ENGLAND.

The PRESIDENT referred, in sympathetic terms, to the death of Mr. William England, who was for many years intimately connected with the Society, and stated that the Council had passed a vote of condolence with the family of the deceased, in which vote he was sure the members generally would wish to be associated. It was agreed that a letter should be addressed to Mr. England a

relatives, expressing the sympathy and condolence of the Society with them in their bereavement.

NEW MEMBERS.

Applications were read from some thirty candidates for membership, and Mr. S. J. Beckett, of Hackney, and Colonel Edward Mockler, H.M. Consul-General at Bagdad, were duly elected.

ELECTORAL REFORM.

The PRESIDENT announced that the question of the modification of the Articles of Association relating to the election of the Council would shortly be considered by a Committee of the whole of that body.

PRESENTATION OF AWARDS.

The PRESIDENT presented the medals awarded by the Judges at the Exhibition to Mr. Wilson Noble, Mr. Paul Martin, Mr. C. F. Inston, Messrs. Bulbeck & Co., and Mr. W. Thomas, addressing to each a few words of congratulation and encouragement. It was arranged that the medals awarded to the following gentlemen, who were not present, should be forwarded to them, viz., Mr. P. von Schoeller (Austria), Mr. A. Stieglitz (New York), Mr. J. Bushby (Liverpool), and Dr. Macdonald.

COMPLIMENTARY.

The thanks of the Society were accorded to the Hanging and Selecting Committees, and also to the Judges, for their services in connexion with the Exhibition.

PRESIDENT'S ADDRESS.

The PRESIDENT then delivered his annual address [see p. 661.]

Mr. J. W. SWAN, M.A., F.R.S., moved that a cordial vote of thanks be given to Captain Abney for his exceedingly interesting address, and the motion was seconded by Mr. W. E. DEBENHAM.

Mr. JOHN SPILLER, in supporting, wished that some better term than I T could have been selected to express *time* and *intensity*, and would have preferred the name of Talbot to have been used, in the same manner as Ampère, Ohm, and Watt had been applied in electricity.

The motion having been carried by acclamation,

The PRESIDENT, in acknowledging the vote, said that, if the name "Talbot" were chosen, it would be the only instance in photography in which the name of a distinguished man was so employed, and he did not think any difficulty would be found in making the printers use capitals for I T.

THE FINANCE OF THE EXHIBITION.

Mr. G. SCAMELL (Hon. Treasurer) stated that the receipts at the Exhibition during the first thirteen days showed an increase of nearly 38*l.* over the corresponding period last year.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 8,—Mr. R. Beckett in the chair.

Messrs. G. H. James and Paul Martin were elected members, and Mr. A. E. Allen proposed for membership.

Mr. Kellow brought up a print of which he was desirous to know the printing process and maker. To all appearances it was some kind of bromide print.

The CHAIRMAN believed that the process was originally brought out by Friese Greene.

Mr. EVERITT said it was a question whether the print had not been mounted on the card after development, and the card then trimmed down. The card presented the appearance that a mounted print gives to it by a slight bend it possessed.

Mr. A. L. HENDERSON gave his promised lantern display on *Sicily*, which places he visited this year. Starting at Palermo, and thence to Taormine, Gergenti, Catania, Syracuse, and Messina, Mr. Henderson showed a large number of slides, chiefly of panoramic views, including cathedrals, royal residences, ancient and ruined temples, and types of the different architectures, besides the ordinary town and country scenery.

Mr. Cole projected on the screen a stereoscopic slide from a negative of the last (or one of the last) Flemish mills in this country, which exhibited, on development, three peculiar markings. One was a plainly outlined head, surmounted by a helmet; another was shaped like the head of a hound; and the third closely resembled the head of a boy wearing a cap. No explanation forthcoming, the subject dropped.

PHOTOGRAPHIC CLUB.

OCTOBER 7,—Mr. A. Mackie in the chair.

Captain Hayes was unanimously elected a member of the Club.

Messrs. Bedding and Carter were elected as Auditors of the Club's accounts for the current year.

A large number of members and friends (about seventy in all) attended to hear a lecture upon

PICTORIAL PHOTOGRAPHY,

by Mr. A. HORSLEY HINTON. Pictorial photography, said Mr. Hinton, is mainly emotional. It is a means of communication between the creator and the spectator, and the response of the latter is the measure of its success. A picture may be accepted by the world without its true merits being appreciated; on the other hand, its meaning may be grasped by the few, and their approval may be worth as much as the praise of the many. The two London Exhibitions constitute the culminating point of the photographic year; they are the something definite to be worked for. A man is not fitted to judge his own work. Knowing what his ideal was, he sees his picture rather as it was intended to be than as it is. One is apt to be too easily satisfied and too lenient to small faults. After seeing both photographic Exhibitions, he felt momentarily despondent for the future of pictorial photography. Is the practitioner unskilful? said Mr. Hinton. Before photography came, was the want of pictorial photography felt? Is there any pleasurable impression, any fine idea, any subtle feeling expressed that has not been as well or better done by other and more recognised methods? Has it brought any new interpretation to art? or, were it obliterated, would the world be poorer? He would fain check the aggressive tendency of those whose self-satisfaction and contentment made photography's position in art hopeless. After all, the answers to the questions he had raised must be according to one's own convictions. Mere picture-making is not synonymous with art, and the phrase "pictorial photography" as a title would provide greater safety and greater freedom than the claim of art permitted. The making of a pleasing picture is the most popular phase to photography, and, as landscape can be more easily portrayed than figure subjects, it had the greatest number of votaries. Only those photographs are pictorial whose interest is in themselves. Expression and composition are the two elements of a picture.

Mr. Hinton's lecture, as will be seen by the above brief extracts, consisted mainly of a series of aphorisms. He interspersed his remarks with many of a lighter character. He instanced how, in one case, he had composed a picture which he called *By Weedy Bank*, but ultimately rechristened *The Road to the Farm*, kindly critics having suggested that the shallow stream of winding water was more suggestive of a dusty road. He compared what he called a technical, topographical photograph, which included a view of five counties and 500 churches, with another of a specimen of *Pulex irritans*. Both, said Mr. Hinton, are obvious physical facts. As for a glossy surface and fine definition, he said that such photographs are to be wondered at for their marvellous perfection, but not for the emotions which they arouse. Mr. Hinton illustrated his lecture with a series of lantern slides and diagrams, in which latter he showed the salient points of the composition of the former.

Mr. MASKELL said that, if he made any remarks at all, it would be to compliment Mr. Hinton upon his admirable lecture. He suggested the advisability of such papers being printed and put into the hands of the Society before they were read, as it was impossible to analyse them in a few impromptu words. The lecture was a series of truisms well expressed. As to whether pictorial photography is needed, the answer was instinctive, We feel it is. The pleasure shown by visitors to exhibitions also demonstrated its need. When he was told that a painter could, with a few masterly strokes, produce better results than a photographer, and that he could do it in five minutes, he (Mr. Maskell) replied, Then let me see it. As a matter of fact, painters cannot do it. We practise photography because we are able to produce results by it which we cannot do by other means; we take refuge in our photographic art because it gives us a new method of expression. His feeling was one of gratitude for a very able paper.

Mr. W. THOMAS agreed that the paper required time for assimilation. He thought that that meeting was a justification of the Affiliation scheme, and he took the opportunity of explaining that the reason a series of lectures were given on consecutive nights was that the rooms were only available if that course were adopted.

Mr. MUMMERY disagreed with the lecturer, who had stated that pictorial photography was impossible with lantern slides.

Mr. EVERITT raised the point that the claim for photography to be an art was a modest but a true one. He said that an engraver was admitted to be an artist, although he but produced another man's picture. There had been great improvements in photography, and it possessed a power of reproduction which the engraver could certainly not excel, even if he could do as well. A painter, however, had advantages over a photographer in that he could take liberties with his subject in a more easy way than could the photographer.

Mr. MORLEY BROOK said he did not know why lantern slides should not be satisfactory in a pictorial sense; their size should not be a great disadvantage. As to the technical defects in production, they could be overcome.

Mr. SNOWDEN WARD said that the lecturer had spoken as if all manipulative work should be done upon the print; he thought much could be done on the negative. With regard to lantern slides, we do not look at the slide, but at the screen, and the statement that we had to look through them, and not at them, must therefore fall through.

Mr. WELFORD said that he was struck with the lecturer's denunciation of lantern slides, but, if the slides shown by Mr. Hinton were to influence the argument, he should agree with him. He thought that Mr. Hinton, as an editor, could have availed himself of the slides which he (Mr. Welford) knew had passed through his hands at one time or another, and which were excellent. Lantern slides could be pictorial or otherwise. It depended upon the way they were produced, and it should be remembered that they pleased a very large number of people.

Mr. HINTON, replying, said that he had not anticipated anything in the nature of a discussion, although he welcomed it. With regard to the controversial points raised, he said that reproduction had nothing to do with pictorial photography. As regards lantern slides, he had not seen one yet which satisfied him. They had no claim to art because they pleased many people.

Mr. BEDDING said the Club was to be congratulated at being the first to hear Mr. Hinton's lecture. Most speakers, in discussing art, generally did so with a bias, but the lecturer had treated his subject very fairly. He thought that in its progress through the country it would provide much useful information and matter for discussion. Mr. Hinton appeared before them in the double capacity of a teacher and a worker, and, failing his works, he could not be better represented than by this lecture. He proposed a hearty vote of thanks to Mr. Hinton.

Mr. WALL, in a few humorous observations, seconded the vote of thanks. He made fun of the lecturer's comparative references to boot polish and high gloss. He added that he thought a man had a right to ask whose plate and lens had been used to make a photograph. It was the only chance that some people would have of working upon the same lines as pictorial artists. As for spending hours over a single print, he did not intend to do it, but there was one thing he should do, and that was to most carefully read through Mr. Hinton's lecture, a copy of which he had in his pocket, and from which he anticipated further pleasure.

Mr. HINTON thanked the meeting for what he described as the flattering and far too kind way in which it had received him. He was gratified at the very cordial reception he had received at the Photographic Club.

Croydon Camera Club.—The winter session of this Club was inaugurated on Wednesday, when, according to usual custom, the PRESIDENT (Mr. Hector Maclean, F.R.P.S.) gave a short address, reviewing current matters of photographic interest, and also speaking upon the future arrangements of the Club. Amongst many notable subjects touched upon were the general use of rollable films and the availability of the acetylene light for various photographic purposes. These were followed by a rapid but complete sketch of the comparatively newly adopted Artigue printing process, which was briefly compared with the better-known so-called carbon process. Mr. Maclean showed a copy of M. Philipp Von Schœller's medalled picture, printed upon Artigue, in illustration of the beauty and general excellence of the process when used by capable hands. In conclusion, he glanced at X-ray work and photographs in motion, and announced that unusually interesting demonstrations by distinguished specialists of the foregoing branches of photography would be given to members. Having referred in some detail to the fixtures and plans for the winter, he appealed to members to maintain the Club's high reputation which it had in past seasons earned for lantern slides. At the termination of the address, Mr. H. E. HOLLAND read a most interesting paper upon

HOW TO MAKE LANTERN SLIDES.

Mr. Holland then proceeded to give a demonstration of his method of working, which was followed with considerable attention by a number of beginners. In the ensuing discussion Messrs. Smith, Costa, Isaac, Richardson, Taylor, and others took part.

Gospel Oak Photographic Society.—On Monday, October 5, the annual Social Evening of this Society was held in the Lecture hall of the Gospel Oak Congregational Church, and was attended by a large number of members and friends. By means of the oxyhydrogen lantern the following members were enabled to exhibit an interesting series of slides, which were much appreciated:—Messrs. Beyer, Hall, Morris, Morton, Palmer, and Pridham. One of the slides exhibited by Mr. Pridham, made from a negative taken by him at the Zoological Gardens, represented a young lady holding a python without apparently any fear. Mr. Pridham stated that this picture had been reproduced in the *Graphic* of September 19. Refreshments having been served, a capital programme was gone through, which included songs by Mrs. Hingston, Miss Lily Sweet, and Messrs. Haywood and Young; also a humorous recitation by Miss M. Brodie, a banjo ditty by Mr. H. Gooding, and a humorous sketch entitled "The Darkie Photographer," in which the characters were taken by Messrs. W. James, H. Gooding, and B. Daly. Miss Randall kindly acted as accompanist during the evening, and also contributed a well-played pianoforte solo. One of the most successful Social Evenings that this Society has had was brought to a termination by singing the National Anthem.

Tooting Camera Club.—On the 9th instant a supper was given to celebrate the return of Mr. J. F. Child (the Club's late Secretary) from the Arctic regions, where he had been engaged as photographer to the Jackson-Harmsworth Expedition. There was a large attendance of members and friends, Mr. J. H. Beckett occupying the chair, and Mr. Joseph Nock the vice-chair. The CHAIRMAN, in proposing Mr. Child's health, mentioned that many friends and acquaintances of the explorer had had grave misgivings as to whether he would be able to withstand the rigours of an Arctic winter, but they had, as events proved, underrated Mr. Child's power of endurance and indomitable pluck, for he had returned, to their great gratification, in the best of health. Mr. CHILD, who was listened to with eager interest, and subjected to many interpolations, spoke at some length, and, in addition to giving his experiences as photographer to the Expedition, graphically depicted the life of the party on Franz Josef Land, and the now historic meeting with Dr. Nansen. He likewise added that Dr. Nansen was an expert photographer, and that during his long journey across the ice, accompanied by Lieutenant Johannsen, the camera was fully utilised. During the evening the toast of "Dr. Nansen" was enthusiastically received, and, at the unanimous request of the members, the Chairman dispatched a telegram to that gentleman, expressing their admiration of his intrepidity, and their best wishes for success in any future explorations he might undertake. The various toasts were interspersed with songs, and altogether the evening was voted an immense success, which was owing in a large measure to the excellent arrangements carried out under the supervision of Messrs. Simmonds and Mayhew (Secretary).

Woolwich Photographic Society.—The annual business meeting was held on Thursday, the 8th inst., in St. John's Schools, Wellington-street, Colonel C. D. Davies presiding. The balance-sheet was read and carried unanimously. The report of the Council was then read, in which it was viewed with satisfaction that, at the close of the year's work, they were able to record the continued advancement of the Society. This was evidenced in the largely increased membership and healthy financial condition. Although the balance in hand was only a small one, it was to be noted that about 5*l.* had been paid during the year to the lantern fund, and property was in hand available for use at future Exhibitions to the value of at least 2*l.* This report was unanimously adopted. Last year the winter session was opened by a series of lectures on photography from a technical point of view; this season it is intended to follow this up by a series of three lectures on the art side of photography, and the Rev. F. C. Lambert has kindly consented to deliver them. It was with deep regret that the meeting heard the announcement that Mr. J. Borthwick Panting would be unable to stand again for the office of Hon. Secretary, his time was so fully occupied in other directions that he felt he would be unable to do the Society or himself justice. Under these circumstances, and taking into consideration the admirable manner in which he had worked for the Society during the last four years, and had pioneered it from a handful of members to its present flourishing condition, with about eighty members, he was not pressed to withdraw his resignation. The officers for the ensuing twelve months were elected as follows:—*President:* Colonel C. D. Davies.—*Vice-Presidents:* Rev. S. E. Chettoe and Messrs. W. H. Dawson, H. H Barker, and J. Borthwick Panting.—*Council:* Messrs. C. Churchill, J. Cregan, J. Desforges, W. R. Dunger, J. Hope, and R. J. Redding.—*Librarian:* Mr. H. J. Maskell.—*Hon. Secretary:* Mr. Frederick W. Machen.—*Hon. Assistant Secretary:* Mr. W. G. Champion. All communications to the Society should in future be addressed to Mr. Frederick W. Machen, 161, Griffin-road, Plumstead.

Leeds Camera Club.—The members of the Leeds Camera Club met on Wednesday evening, September 30, the subject being *Hints to Beginners on the Choice of Apparatus.* It was with deep regret that the members learnt that, owing to severe illness, Mr. C. B. Vevers (who should have given the lecture) would be unable to do so. Mr. J. GARBUTT very kindly undertook the duty, and very ably did he acquit himself of the task. He pointed out the pitfalls which many are apt to fall into by purchasing the cheap and nasty articles that are placed upon the market to catch the unwary, and strongly advised members to give a fair and reasonable price for their outfit, thereby making certain of getting something that would not only be a pleasure to work with, but of fair durability. Useful hints were given also with reference to the use of chemicals, developers, dark rooms, and their appurtenances, and the choice of hand cameras. The whole was a *résumé* of good, sound, practical advice to those about to take up the mysteries and fascinations of the "dark art." The lecture was much appreciated by a large audience, and a very hearty vote of thanks was accorded to Mr. Garbutt for his services.

Plymouth Photographic Society.—The Society opened its winter session on October 9 with a social gathering of members and friends. Nearly a hundred attended. The PRESIDENT (Mr. E. H. Micklewood) welcomed the friends, and announced a very attractive programme for the first half of the winter session. One of the Vice-Presidents (Mr. Aver W. Duncan) kindly provided a choice selection of transparencies, stereoscopes, concave mirrors, and graphescopes, with some of the best examples of work of the best men. Messrs. Heath & Co., the well-known local opticians, kindly sent a lantern illuminated by the Incanto acetylene gas apparatus. Except some very dense slides, the illumination was excellent, and a set of Mr. Duncan's, of Cotehell House, a local example of one of the best-preserved manor houses in the kingdom, were specially admired. Vocal and instrumental music and the handing round of light refreshments completed the inaugural function of the Plymouth Society.

Rotherham Photographic Society.—Annual Meeting, October 6, Dr. Baldwin (President) in the chair.—The report recorded a satisfactory amount of progress both in regard to the individual work of members, the strength of the Society, and the character of the meetings. The annual Exhibition has yielded a net profit of 5*l.* 9*s.* 7½*d.* The enlarging lantern balance has been paid off. The total sum standing to the Society's credit was 6*l.* 2*s.* 5½*d.* Regret was expressed at the feeble character of the competition for members' work and at the small attendances at the summer excursions. The appointments for the year were as under:—*President:* Dr. F. B. Judge Baldwin.—*Vice-Presidents:* Messrs. E. Isle Hubbard, G. T. M. Rackstraw, and J. Leadbeater.—*Hon. Treasurer:* Mr. A. S. Lyth.—*Hon. Secretary:* Mr. H. C. Hemmingway. These officers with the following members constitute the Council, viz., Messrs. W. Mason, John Clarke, R. H. Law, J. Turner, and C. E. Parkin, jun. The special subject was *Hand Camera Work*, and 112 prints were exhibited by Messrs. Rackstraw, Hubbard, Mason, Parkin, Lyth, and Oldham. It was announced that the season's programme was very complete.

Sheffield Photographic Society.—October 6, Annual Meeting, Mr. B. Nowill occupied the chair.—The Treasurer (Mr. Smith) presented his annual report and balance-sheet, which showed the Society to be in a sound financial position, and was unanimously adopted. The Secretary read his annual report, giving an outline of the work done and meetings held, and making several suggestions for the coming year. Eleven new members have been elected during the year, and six were elected whilst the meeting was in progress. Votes of thanks were passed to the Auditors and retiring officers for past services, and the election of officers for the ensuing year was next proceeded with, and resulted as follows:—*President:* Mr. G. Tomlinson.—*Vice-Presidents:* Messrs. B. Nowill, E. Beck, and T. Firth.—*Council:* Messrs. S. Camp, W. T. Furniss, D. C. Brooks, T. Hibbert, and E. H. Pearce.—*Reporter:* Mr. George W. Blackwell.—*Treasurer:* Mr. Joseph Smith.—*Secretary:* Mr. Herbert Ellis.

Edinburgh Photographic Society —October 8.—Mr. F. P. MOFFAT (the President), in a short, vigorous address, impressed upon his hearers the necessity of members taking part individually in the discussions and other work of the Society. If members would make a point of asking a question now and again, they would soon find that they were benefiting greatly, and would feel a renewed interest in the affairs of the Society. Besides the usual monthly meetings, it was explained, the Elementary Section under Mr. Lugton, and the Lantern Section in charge of Mr. Souter, held regular meetings. There were, therefore, plenty of opportunities for the acquiring of knowledge on photographic matters. Mr. Moffat has been a member for twenty years, and the interest he takes in the Society is well known. After reviewing the past, he showed that the Society was now in a more flourishing condition than ever. The report of the Treasurer, Mr. G. Cleland, showed the financial affairs to be in a very satisfactory state. Captain W. Morrison, Army Medical Staff, then delivered a lecture on Ceylon; its scenery, temples, and industries. The lecture was most interesting, and profusely illustrated by lantern slides. At the close, Captain Morrison and Mr. Moffat were heartily thanked.

FORTHCOMING EXHIBITIONS.

1896.		
Oct. 16-Nov. 7	.....	Photographic Salon, Dudley Gallery, Piccadilly. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 16-Nov. 12	.....	Royal Photographic Society. R. Child Bayley, 12, Hanover-square.
,, 26-31	.....	Southport Social Photographic Club.
November 12	.....	Dulwich Photographic Society.
,, 17-20	.....	Hackney Photographic Society. W. F. Fenton Jones, 12, King Edward Road, Hackney.
December 3, 4	.....	Aintree Photographic Society. E. P. Heron, 2 Tilney-street, Orrell Park, Aintree, Liverpool.
Dec. 1896-Jan. 1897		Bristol International. Hon. Secretary, 20, Berkeley-square, Clifton, Bristol.

Patent News.

The following applications for Patents were made between September 30 and October 7, 1896:—

APPARATUS.—No. 21,435. "Improvements in Photographic Apparatus." A. C. SMITH.

CAMERAS.—No. 21,475. "Improvements in Photographic Cameras." E. P. SCHOENFELDER and E. KEHLE.

DISHES AND BATHS.—No. 21,495. "Improvements in Dishes or Baths employed in Developing and like Photographic and Chemical operations." W. S. WAIN.

DARK SLIDE.—No. 21,505. "An Improved Photographic Dark Slide." F. E. BROWN and W. EDWARDS.

SCREEN KINETOSCOPY.—No. 21,554. "Improvements in connexion with the Projection of Photographs of Animated Subjects and Methods of taking the said Subjects." J. BONN.

PORTABLE APPARATUS.—No. 21,755. "Improvements in Portable Photographic Apparatus." Complete specification. E. BLOCH.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE TANNING ACTION OF PYRO ON GELATINE.

To the EDITORS.

GENTLEMEN,—Referring to the discussion on the tanning action of pyro at a recent meeting of the London and Provincial Photographic Association as reported in last week's issue, I think Mr. Warnerke stated the real case some years ago when he first introduced his process now applied to photogravure. If pyro alone, or even pyro in conjunction with alkali, and therefore in a more or less oxidised condition, exercised the tanning action —at any rate in a reasonable time—the Warnerke process would be an impossibility. Mr. Warnerke, if I remember rightly, ascribed the insolubilising action in his process to the combined effect of light and development. If it were dependent on development alone, the whole film would become insoluble instead of only those parts in which there is a deposit of silver.

If any one will take the trouble to add some alkaline pyro to two separate bottles of gelatine emulsion, and, after allowing them both to "set," will expose one of them to light, and then immerse both in hot water, he will come to the conclusion that light has something to do with the tanning. Again, if a piece of ordinary gelatine chloride paper be exposed under an opaque mask, with a clearly cut opening, until a bronzed image of the latter is formed, it will be found that the unexposed portion of the sensitive film is easily dissolved with only moderately warm water, while the exposed part will, for a long time, resist a much higher temperature. Here is the action of light alone without pyro.—I am, yours, &c.,

October 12, 1896. W. B. BOLTON.

GOLD PAINT FOR PHOTOGRAPHIC PURPOSES.

To the EDITORS.

GENTLEMEN,—Seeing in your JOURNAL, issued September 25, 1896, two paragraphs *re* gold bronzing for photographic mounts, I may say I have used a gold paint for this purpose, the best I have ever come across, as it is thoroughly permanent, and weak acids or water have no effect on it whatever. I have heard lately that it is being used in this part of the country for outside work, and is satisfactory.

I do not think it is generally known, as it is practically new. Now, I think, if this article was known of by the photographing fraternity, it would be widely used. I have used some quantity, both of the colours and golds, and believe there are something like forty colours, and six or seven shades of gold. The name of the paint is "The New Electric," manufactured by Hayes & Co., Bristol; there is no other address on the label, but no doubt this will find them by post.

I should advise brother photographers to try this, as I am sure it is worth the trouble of procuring a really good article for a small sum.—I am, yours, &c., A. EVANS.

Tremont, Nottingham-road, Bishopston, Bristol, October 5, 1896.

THE PHOTOGRAPHIC SALON.

To the EDITORS.

GENTLEMEN,—It is not often that the "Rejected" send forth to the world such a bitter wail as that which came from Mr. J. C. Oliver last week, and I must say I feel sorry for him—sorry, not because his works were rejected, but because his disappointment has evidently not had a good effect upon him. If he feels his "sweetness has been wasted on the desert air" on this occasion, it should have stirred him up to gather more, with a determination that next year his sweetness should be so sweet that the Dudley Gallery should be flooded with it.

As I understand the constitution of the Photographic Salon, *all* works sent in for exhibition are submitted to a Committee composed of men who are, above all others, best qualified to judge pictorial photography. To be accepted and hung is an honour, undoubtedly the greatest a pictorial photograph can gain; to be rejected is not, as Mr. J. C. Oliver seems to think, an insult, but should be an incentive to better work next year. If, however, Mr. J. C. Oliver has reached that point (and from his letter I gather he has) where no improvement can possibly be made in his pictures, I should advise him to send them next September to Pall Mall.—I am, yours, &c., CHARLES MOSS.

Coombe-road, Croydon.

THE KINESIGRAPH.

To the EDITORS.

GENTLEMEN,—Your issue of the 9th instant contains a letter signed J. Vincent Elsden, in which it is claimed that the *principle* of the kinesigraph "has been public property for nearly thirty years." This extraordinary contention is supported by showing that, "as early as 1868, M. Roman Talbot brought into notice an optical toy," which he describes, and which turns out to be a wheel of life or zoetrope, in which photographs were substituted for the clumsy little drawings previously used.

Now, sir, this is to entirely misunderstand the principle of the kinesigraph. It is to confound the photography of *motion* with a series of photographs so arranged as to give an appearance of motion, a very different matter.

The zoetrope was a very ingenious toy, but every one remembers the absurd and amusingly unreal movements of the figures. The use of photographs, doubtless, improved their statical accuracy, but it left their dynamical inaccuracy untouched, and, if anything, even more obviously ridiculous.

It is surely one thing to give an apparent and arbitrary motive to a photographed or drawn figure, and quite another thing to photograph the actual movements of the bodies in the field of vision. Mr. Birt Acres avoids this error in his letter of September 18. He says: "Twenty-four years ago I made wheel-of-life pictures, drawn partly from photographs. I tried to make them by photography purely." But he further says: "I do not profess to be the original inventor of animated photography," by which I take him to mean the inventor of the photography of motion.

Since Mr. Birt Acres has probably done more than almost any other man to perfect the practical application of the principle of the kinesigraph, his modest disclaimer is all the more striking. Mr. Elsden would do well to preface his next utterances on the subject with a definition of kinesigraphy, which denotes the *re*presentation of motion—of real, actual motion—and not a mere presentment of arbitrary movements of photographed bodies, which never performed or could perform such movements in nature.—I am, yours, &c., WORDSWORTH DONISTHORPE.

Reigate, October 12, 1896.

THE POISONS ACT.

To the EDITORS.

GENTLEMEN,—"A Pharmaceutical Chemist" accuses me of having employed "malignant abuse" as a form of argument, not a trace of which abuse can I discover in my former letter; and then, again, he as good as tells me that I am a liar, that is, however, a matter of no consequence, for the "anecdotes" to which he refers are, every one of them, absolutely true.

With regard to the chemical education of pharmaceutical chemists, I must refer him to "Dogberry" in your last issue. As to the framing of the Poisons Act, I understand that no person is allowed to sell poisons, unless registered under the Act, and subject to such regulations *as may be prescribed by the Pharmaceutical Society*, with the consent of the Privy Council. Is that correct or not? Unregistered persons are forbidden to assume or use the title "chemist." That is an absurd regulation in view of actual facts; but it is not clear who is responsible for it,

With regard to signing the poison book, the main object of this regulation is to afford means of tracing the purchaser in case the poison is used for criminal purposes; if this regulation does not apply to bichloride of mercury, there is apparently little need for it in the case of other poisons.

There should be stringent regulations with regard to the sale of poisons which by reason of their nature can be conveniently administered to other people; but no such regulations can have any effect in diminishing suicides. Up to the present, though the suicides from scheduled poisons have decreased, nevertheless, the total, if anything, tends to increase; and, if all the known poisons were included in the schedule, the result would be the same. Take away one weapon, another is adopted. I admit that certain regulations are necessary, but such regulations should be complete, rational, and properly adhered to; and they should not be formed so as to put a monopoly into the hands of one class of tradesmen to the exclusion of others, who are equally well qualified to carry them out.

Purchasers who require poisons for legitimate purposes are quite ready to conform to any reasonable regulations, but, under present circumstances, getting the poison at all depends more or less upon luck. Take, for instance, potassium ferricyanide. Personally, I have had more trouble over getting this poison than with any other; sometimes I can get it easily, and sometimes not at all. Pharmaceutical chemists do not

keep it in a sufficiently pure condition to be of any use, yet, strictly speaking, they appear to be the only persons who, under the Act, are qualified to sell it. Pharmaceutical and photographic chemists even do not often keep it "pure." I must go to a manufacturing chemist to ensure getting the right thing, and, unless I go to one who knows me, I probably shall not get it even then—all this vexatious trouble on account of a poison the criminal use of which I have never heard of.

What photographers want is, that, under reasonable regulations, they may be able to obtain their poisons from the same dealers that they buy their other chemicals from, that is, from photographic chemists. Pharmaceutical chemists do not keep chemicals of sufficient purity, and charge outrageous prices for the impure ones they do keep; consequently, as photographers, we prefer not to go to them.

It is all very well to lay the responsibility for the Poisons Act upon the "Law," but this particular law was apparently framed upon the recommendations of the Pharmaceutical Society, that is, by the very people to whom a monopoly of the sale of poisons is valuable. A committee of expert scientific chemists would have drawn up a better schedule, and the regulations would have been fairer if left to men not personally interested in the sale of poisons. To talk about the protection of the public is absurd under the present state of affairs.

With regard to the chemical examination of a pharmaceutical chemist being of equal stringency with the B.Sc. examination, I should like to hear the opinion of a B.Sc. upon the point. I have passed through many examinations myself, and know full well that it is much easier to "get through," or "qualify," by judicious cramming in a subject that you really know little about than it is to secure a high position in a subject that you have considerable knowledge of. The mere fact of having "passed" implies very little. The art of passing examinations has been brought to great perfection, but the art of acquiring knowledge is no more perfect than it was a century ago. I have known many men who failed in examinations, not from want of knowledge, but from want of nerve, while others, who were comparatively ignorant, passed easily. Passing simply means that a minimum amount of knowledge is retained for the time of the examination, nothing more. The possession of knowledge is evinced by what the man does *after* he has passed.—I am, yours, &c.,

NEMO.

October 9, 1896.

To the EDITORS.

GENTLEMEN,—The frantic and bulky communication of the gentle "Nemo" quite perfumes the air, and I am now able to sympathise with the sportsman, who has accidentally hit a wild elephant and is forthwith charged down upon by the screaming and infuriated animal.

A druggist asked him this, a doctor told him that, a friend informed him something else, &c. From his own confessions it is evident that the class of doctors and druggists he knows, or is likely to know, belong to the "residuum" of their respective occupations. If I were to provide your readers with a relation of all the comical incidents I know that have occurred through the vexations, ignorance of so-called photographic dealers, I could fill an entire page or more of the B.J.P. without difficulty, anecdotes of such a character are quite important circumstances in the eyes of "Nemo." Having exhausted his collection of childish tales, he informs us what are "the real points of issue" by the irregular method of asking questions founded upon erroneous assumptions. Let us take them in order to provide him with satisfaction.

Firstly, "Why should I be allowed to appropriate the title of 'chemist?'" Well, why should a medical practitioner be allowed to appropriate the title of "doctor?" "Nemo" with his persistent *suppressio veri et suggestio falsi*, attempts to smother the fact that a stringent examination in chemistry, in addition to *materia medica*, botany, pharmacy, and other subjects, has to be passed by the "chemist;" perhaps "Nemo" will not "try to forget" that in future.

Secondly, "Why should chemists have a monopoly of the sale of poisons? Because the advisers of the State have decided, for the benefit of the State, that the sale of poisons shall be taken away from miscellaneous and irresponsible hucksters, and placed in the hands of a properly educated, regulated, and centrally controlled body of men; and there is nothing whatever to prevent any man, with the average amount of brains, from joining that body if he desires to do so.

Thirdly, "Why don't the 'chemists' take steps to have the schedule of poisons enlarged?" Chemists have no power in the matter, we are an administrative body, not a legislating one. This matter is even now under the consideration of the Privy Council and the Poison Schedules are going to be enlarged; but it is not at all probable that the "chemists'" interest will be taken into consideration. "Nemo" is not satisfied with the schedules as they are, and he will be probably still more dissatisfied with them as they will be.

Fourthly, "Why does the Pharmaceutical Council allow quack medicines containing scheduled poisons to be sold by anybody?" They do not allow it, and they have quite recently prosecuted and fined many vendors of quack medicines for infringing this clause of the Act. "Nemo's" information requires a little readjustment. And, why do we find oxalic acid and spirit of salt in many households, although they are scheduled poisons? Again, either real ignorance, or, in order to mislead, pretended ignorance. There are two poison schedules, one requiring a customer's signature, and another schedule of less dangerous substances, including oxalic acid, which do not require signing for. Spirit of salt has never been scheduled at all yet, so that "Nemo" and his friends can sell it if they please. If "Nemo" has any more questions to ask, he had better ground them upon facts, and not upon a foundation in which ignorance and the "economy of truth" are conspicuous indeed, but not, alas by their absence.—I am, yours, &c.,

PHARMACIAN.

To the EDITORS.

GENTLEMEN,—The "poisons" tirade has now been going on some weeks, and some of the letters are not only extremely irritating and exasperating, but offensive. Nor do they go to the root of the matter, but take side issues. Shall chemists retain the monopoly of selling poisons, or not? At present the law is with the qualified chemist, and so the abuse directed towards him is, in a manner of speaking, cowardly. The virulence, if any is needed, ought to be used against the Pharmaceutical Society, because they carry out their duties more stringently than common sense dictates. It is, perhaps, unlawful for a photographic dealer to sell any sort of poison, but the Pharmaceutical Society might wink at it, and see that the public are not harmed. They take a too selfish trade-unionism view of the matter. But it is not at all likely the Pharmaceutical Society will give way. Their very existence depends, in a measure, upon the Poisons Act. What might be done is to bring pressure upon that body, so as to modify the examination when the poisons are for arts and manufactures. Now, supposing in their modified examination you showed a satisfactory knowledge, and could also produce certificates in qualifying science subjects, such as theoretical and practical chemistry, both inorganic and organic, say on a basis of the advanced, or honours stage, at South Kensington, or of a University, what would, very likely, be the result? There are hundreds who will never be able to pass the Pharmaceutical 'minor' that would get through this. Then we should have grocers, ironmongers, oilmen, and others putting in their windows, "licensed poisoners"—beg pardon, "licensed to sell poisons." Again, supposing you only allowed them to sell poisons for arts and manufactures, and not for any application to living bodies, how is this thin, invisible line to protect the public against wholesale poisoning, either by murder or suicide? Many forms of poisons are too easily got at now. It would be more sensible on the part of the Pharmaceutical Society to use discretion, and not raise a storm of opposition about their ears.—I am, yours, &c.,

S. E. K.

Reading, October 7, 1896.

To the EDITORS.

GENTLEMEN,—Your correspondent, Mr. James Reed, in his letter dated October 1, referring to this Act, says: "It draws up a schedule of poisons which cannot be sold by any but those who have complied with the *educational demands* of the State." Therein is the crucial point of the whole argument. It is not educational attainments at all, but membership of the Pharmaceutical Society, that qualifies the man to sell poisons, and it is the fact, that those whose knowledge of chemistry is far above that required by the Act are still prosecuted for selling, while any one who has "crammed" for his examination (and there are ignorant men among chemists equally as in every other business) has, in common with his fellow-members, the sole right of selling to photographers substances of whose properties he may be thoroughly ignorant, that is responsible for all the outcries against the Poisons Act. It creates a monopoly in favour of one particular class, and to the disadvantage of those who require the materials for their work. Every photographer must, at times, have experienced the great difficulty that exists in obtaining certain substances because they are scheduled poisons, while others almost equally dangerous may be sold without any restriction.—I am, yours, &c.,

HENRY W. BENNETT.

Hastings House, Norfolk-street, W.C. October 13, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street. Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Robert William Howes, Dereham.—*Two photographs of Clare Sewell Read, Esq.*

A. Edwards, West End Studio, Morecambe.—*Photograph of high tide at Morecambe, October* 8, 1896.

Richard Hutton Blyth, photographer, Ilfracombe.—*Two photographs of Mrs. Jane Bray, another Ilfracombe Centenarian.*

Albert Rudolph Douglas, 23, Upper Dicconson-street, Wigan.—*Three photographs of Rev. Wm. Medley (Professor), Rawdon College, Bradford.*

John Blair Scott, 18-22, Devonshire-street, Carlisle.—*Photograph of H.R.H. the Duke of Cambridge. Photograph of H.R.H. the Duke of Cambridge, Lord and Lady Hothfield, and party.*

Mark William Thompstone, Allandale, Brooklands, Cheshire.—*Photograph of young lady seated at a table with writing materials before her, pen held by right hand to the lips, and titled, "What Shall I Say?"*

RECEIVED.—J. PIKE; W. D.; FOCUS; F. G. WILLATT; EDGAR SCAMELL; MANCHESTER PHOTOGRAPHIC SOCIETY, and others. In our next.

STAINS.—H. W. The metallic stains on the back of the film, as seen through the glass, are due to a dirty plate before it was coated. The remedy is obvious.

ENAMEL COLOURS FOR ENAMEL PAINTING.—W. NELSON. These colours may be obtained from Lechertier, Barbe, & Co., The Quadrant, Regent-street, W.

SITUATION IN GERMANY.—W. ZEIGER, of St. Tugbert (Pfalz, Germany), writes: "Your correspondent, Mr. A. O. Yardley, who is desirous of obtaining a situation in Germany, may communicate with me."

TRANSFER INK.—R. BIRDSEY. Winstone & Sons, Shoe-lane, make a special ink for photographic transfers. A suitable transfer ink is also, we believe, supplied by Penrose & Co., Amwell-street.

DAMAGE TO STUDIO.—S. W. As you hold the premises on a repairing lease, you cannot compel the landlord to repair the damage done to the studio by the late storms. "The act of God" does not apply in such cases.

THINNING CELLULOID VARNISH.—W. SMITH says: "Will you please tell me what is the best thing for thinning celluloid varnish? If more than one chemical is wanted, please give me the exact proportions."—Dilution with double its bulk of methylated spirit is recommended.

ZINCO BLOCKS.—H. A. MARLEE. Any process worker will undertake these. Surely there are such firms in your town. If not, run through our advertisement pages, or those of the ALMANAC, where several names are given. It is, however, hardly worth your while to send all the way to London.

STEREOSCOPIC PHOTOGRAPHY.—WARMINSTER. Stereoscopic pictures may be taken quite as well, so far as stereoscopic relief is concerned, with a single lens and moving the camera, as with a twin lens camera; but the latter is much to be preferred, and, for moving objects, is imperative.

ANCIENT LIGHT.—W. A. W. If the facts be as stated, you can certainly prevent your neighbour from putting up his building so as to obstruct your light. As your studio has stood for over twenty years, it enjoys the "ancient lights" privilege, which must not be infringed. The remedy is by injunction, and, as we have just said, there is no question as to the result.

THE ANIMATOGRAPH.—AJAX says: "Can you give me the names and addresses of any persons or firms who would undertake to provide and manage an exhibition (for one night only) of the cinematograph or kinetoscope? If so, you would much oblige."—Probably Mr. Birt Acres, the Northern Photographic Works, Salisbury-road, Barnet, would do so. Better write him.

REPRODUCING NEGATIVES.—T. PRATT. The cause of feebleness in the reproduced negatives is unquestionably due to the thin and flat character of the transparencies, that is, if the one sent—which, by the way, arrived, as did the negative, in fragments, owing to insufficient packing—may be taken as a type of the others. For vigorous reproductions vigorous negatives are necessary.

INCREASING ANGLE OF LENS.—A. H. BENN. It is quite correct that by shortening the tube of a rectilinear, so as to bring the glasses closer together, the lens can be made to cover a larger plate, and thus embrace a wider angle of view. But it must be borne in mind that a much smaller stop will have to be used with it so that, in its altered condition, it will be a slow lens instead of a rapid one.

BROMIDES FOR PLATINOTYPES.—T. MORLEY.—If the prints, when immersed in a solution of bichloride of mercury, fade, there is no question that they are silver prints, and not platinotypes. Your friends can, if they choose, proceed against the parties under the False Trades Description Law; but probably, when the fraud is charged against them, they will gladly refund the money, rather than stand the exposure.

WM. HUME.—It is difficult to assign a satisfactory explanation for the reversal. The most feasible seems to be that, as a similar result, viz., a positive from a positive, may be produced by considerable over-exposure, the latter cause is really at the bottom of the matter. We ourselves have produced analogous results on plates previously exposed to light, also by subjecting the exposed plate for a considerable time to the influence of the dark-room light. Such experiences as yours are very common. Sorry we can give no decided information on the point.

LENS BOUGHT AT SALE.—C. A. S. In selling a lens at auction, the auctioneer cannot be held responsible for its quality, and you have no redress whatever. The lens, you say, bears no name, and is very inferior but that has nothing to do with the auctioneer. It was sent to him to sell to the highest bidder, and of course, as at all auctions, the buyer must use his discretion. Read the conditions of sale, which are printed on the catalogue. Even at an auction sale, you must not expect to get an instrument for a pound equal to one that a first-class maker catalogues for more than six times that sum.

C. H. PRICE.—Sorry we are unable to help you. We have inserted query in The Inquirer column.

COLOURS FOR SPOTTING NEGATIVES.—S. PALMER says: "I, as an amateur, have great difficulty in stopping out pinholes, &c. in my negatives. Almost all who have said anything on the subject recommend a different colour from the others. Some say Indian ink, some Venetian red, some sepia, others indigo or Prussian blue, &c. Which is best?"—It really matters little which colour is used, so long as its printing value, as applied, thickly or thinly, equals that of the portion on which it is used. A novice will generally get on best with a colour that most nearly approximates that of the negative. Any tint may, of course, be obtained by an admixture of colours to match that.

THE X RAYS.—X RAYS says: "Would any one give me a rough outline of the X rays, to be a guide, as I want to go through the operation for fun at a party? Of course, no photographs will be taken."—In reply: We presume our correspondent simply wishes to produce the phenomena of the phosphorescent Crookes' tubes, and desires to know how to proceed. Articles giving the necessary information appeared in the JOURNAL of February 28 and in many subsequent issues. Under our Editorial Table we have also noticed several books dealing with the phenomena. But, while our correspondent is about it, he might add to the "fun" of himself and his friends by actually taking a radiograph, as the additional expense thereby incurred is slight.

VARNISHING NEGATIVES.—T. BIDGOOD writes: "How are negatives varnished? I have obtained two or three different makers' varnish, and they all seem pretty much alike, and the directions for application are the same with all: Warm the plate, pour on the varnish, flow over the plate, then drain off and dry the plate before the fire. Now, how is any one to do this? I have tried many times, with the result that more varnish is spoilt than used, and as much, almost, gets on the back of the glass as remains on the front. Are these directions given by the makers to cause amateurs to waste the varnish and so increase the sale? How do professional photographers varnish their negatives?" — Professionals varnish their negatives in the way quoted by our correspondent. With a little practice there will be no difficulty in flowing the varnish evenly over the plate and draining it off without spilling or letting it get on the back.

BOOKS ON LENSES AND ENLARGING.—AMBITIOUS says: "1. I have always been at a loss to thoroughly understand how to obtain the focus of any lens, and what that really means. I know that different lenses have different focus, and are suitable for certain subjects; and, as a first-class assistant operator, &c., who aspires to fill a good position as a first-class photographer in time, I keenly feel the lack of that knowledge. Therefore, if you could advise me upon any course I could take—I presume it would be books—I should be very grateful. I have seen books giving different focus of lenses, but they seem so complicated; I want something that starts at the beginning. 2. Also, I wanted to know of a book that deals with enlarging thoroughly, describing its different parts and uses, and how to work it."—1. Possibly the best book devoted to the subject is that by the late J. Traill Taylor on *Photographic Optics*. It is published by Messrs. Whittaker & Co., White Hart-street, Paternoster-square, price 3*s.* 6*d.* A few weeks spent in a careful study of that book will impart to you much knowledge likely to be useful to you as a photographer. 2. Mr. Fallowfield, 126, Charing Cross-road, W.C., publishes a book on bromide enlarging, price 1*s.*, which will give you an insight into the principles of enlarging. A book which deals exhaustively with the details of every enlarging process has probably yet to appear.

RECOVERY OF GOLD.—BLACKBURN writes: "I am engaged in a business where about eight quires of paper per week are printed. Certain reasons make it imperative that the toning of the same be done rapidly. To effect this, I use a freshly made, strong, hand hot borax bath. The prints are toned in from three to five minutes, fresh gold being added whenever the least sign of slowness appears. I feel sure that a large quantity of gold is wasted, that is, in the sense of not being deposited on the prints, so latterly I have been trying to recover the same by adding a small quantity of sulphate of iron in solution to a Winchester of the toning solution, in which nearly a quarter of a pound of borax and three tubes of gold had been used. This caused a precipitate of a very fine nature to fall in two or three days, and, when filtered, the supernatant liquid was as black as ink, so I then added a much larger quantity of iron solution, and found that the precipitate was thrown down in a very short time. Kindly inform me if I am doing right by adding so large a quantity of iron, or if it will interfere with the subsequent recovery of the gold. On that point can you tell me how I should proceed to do the same myself, instead of sending it to the refiners?"—The proceeding is quite right. The sulphate of iron should be added so long as anything can be precipitated. The precipitate contains silver as well as gold. It is well to acidify the iron solution strongly with sulphuric acid before adding it to the old toning solution. If our correspondent is not familiar with chemical manipulations, he will find it best to send the residue to the refiner. However, the gold may be recovered in this way: First, well wash the residue with water, then put into a glass flask, and boil in dilute sulphuric acid to remove all traces of the iron, well wash again, and drain closely. Next add nitro-hydrochloric acid and boil again. This will dissolve the gold. Drain off on to a filter and repeat the operation to ensure the solution of all the gold. Wash the precipitate, which is chloride of silver, in two or three changes of distilled water, which are also put through the filter. The filtrate is now an acid solution of chloride of gold. If, now, a filtered solution of protosulphate of iron be added, it will throw down the gold in a pure state. It can then be converted into chloride of gold by dissolving in nitro-hydrochloric acid and crystallising.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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EX CATHEDRÂ.

Photographers and others who use acetylene will be interested to know that there is a probability of the insurance companies taking cognisance of it as a more or less dangerous explosive, and therefore likely to influence the granting of policies. We some months ago stated that an American Fire Underwriters' Association had recommended to its members the refusal of permission for its use in buildings covered by their policies, and we have been recently shown a letter from an English office to a photographer insuring his premises in which a preliminary inquiry is made as to whether acetylene is used. We presume the English Offices have taken up the cautious attitude of the American insurance associations; but it is interesting to note that the American offices object to the use of *compressed* acetylene in cylinders, and not to the gas directly generated from the carbide, surrounding which, as they properly remark, no special hazard attaches. We hope, therefore, that the English offices have not been misled in the matter.

* * *

The Eastman Photographic Materials Company have recently opened a new branch at 91, Markgrafen-strasse, Berlin. In addition, the Paris premises of the Company at 4, Place Vendôme have undergone enlargement, a step that is in contemplation as regards the London establishment at 115–117, Oxford-street, which have been found inadequate for the growing business of the Company. We also gather from Mr. Dickman, the Managing Director, that branches in other Continental capitals besides those named will ere long probably be opened. The Company are to be congratulated on these unmistakable signs of well-deserved prosperity.

* * *

A new delight to those whose works secure the advantage of being hung at photographic exhibitions has been revealed to us by a well-known provincial photographer, some of whose photographs are now on view in Piccadilly and Pall Mall. He was asked by a journal to forward particulars of his exhibits, and, having done so, received the following communication: "I beg to acknowledge receipt of particulars with which you have favoured me, and find therein materials for an excellent article. No doubt, it would be very useful to you for us to give such an article, as it would probably lead to a large increase in your business, such increase being of a permanent character. I shall be happy to give directions for the article to be prepared forthwith, and should be glad to know whether you have any blocks for the purpose of illustrating the same, and also if, by way of *quid pro quo*, you will take, say, 100 copies of the journal containing the article. On receipt of your reply, I will forward proof of article. Your business with our readers ought certainly to be considerable."

* * *

The system of advertising here outlined is comparatively old, and in some respects possibly has much to commend it. To photographers generally, however, its advantages are not clear, as, with few exceptions, they depend almost exclusively upon local patronage, which is perhaps not likely to be influenced by notices in a journal which appeals to persons at a distance connected with railways, steamships, mines, &c. However, unlike the diary scheme for inducing photographers to take portraits for nothing, so often mentioned by us of late, a *quid pro quo* does enter into the latest idea of utilising professional photographers to commercial advantage.

* * *

From the Polytechnic Institution, 309, Regent-street, we have received the winter programme of craft instruction in

photography and photo-engraving. Lectures and practical courses are given in most photographic subjects, and special attention appears to be devoted to the process department, in which three-colour negative-making, screen-negative making, half-tone block-making, photogravure, photo-lithography, and collotype are prominently mentioned.

* * *

In the Journal recently we gave particulars of a process for embossing photographs, that is, the imparting of low relief to portrait studies and similar subjects. We have since had the opportunity of examining some specimens produced by the process. Printed in platinum, bromide, or carbon, it can readily be imagined that a portrait bust in relief would, if suitably framed, be possessed of a highly effective and artistic appearance. Such, indeed, were the characteristics of the specimens that were shown to us. These bas-relief photographs are just now very popular in America, and we are of opinion that there is a field open for them in this country.

* * *

According to a transatlantic contemporary, the position of colour photography in America by the McDonough and Joly processes is hardly yet in a satisfactory condition. The company recently organized in Virginia to make photographs in colour has, it is said, acquired the right to work the process of McDonough, of Chicago, and it is expected that the necessary plant will be ready for actual work in a short time. On the other hand, however, in conversation with the two gentlemen who had charge of Joly's colour process in America, it was learned by our contemporary that McDonough's patents are of no value, being antedated by those secured by the Joly combination. Those directly connected with both the processes mentioned are very secretive as to their plans, but it seems certain that there will be fighting in the courts before either process is worked commercially.

SINGLE TRANSPARENCIES IN NATURAL COLOURS.

One of the features of the process of photography in natural colours which Mr. Bennetto, of Newquay, Cornwall, is alleged to have discovered, consists in the fact, as vouched for by those who have seen the results projected on to a screen by means of the optical lantern, that, to all appearances, one transparency only, on which is impressed the colours of the original subject, is employed. This seems to them to dispose of the idea that the three-colour process, as practised so successfully by Mr. F. E. Ives and others, is the method chosen by Mr. Bennetto for the production of his results.

It is suggested to us by a correspondent this week that the process of producing natural colours in a single transparency, such as Mr. Bennetto's method is said to be, is a distinct departure, the more especially as it is claimed that no colour, dye, or pigment, is employed in the attainment of the colours; and we are asked if we had previously heard mention of such a process. It may be of interest, therefore, if we outline a method of colour photography, which, if it does not exactly coincide with that attributed to Mr. Bennetto, at least allows of absolute comparison with it, in that it admits of the preparation of what *appears* to be a single transparency in the colours of nature.

To Mr. F. E. Ives it is that we are indebted for the few details of the process that we append. Quite recently Mr. Ives was kind enough to show us some lantern slides made by the process, and they struck us as being so beautiful and faithful to the colours of the originals that, were they projected on to a screen, at Newquay or elsewhere, they could not fail to excite the highest admiration.

Here is the process, which, we may remark, has been published before by Mr. Ives, both in this country and America. The system is applicable either to glass or paper prints.

The three negatives are taken in the photo-chromoscopic camera in the ordinary way. To prepare the positive the procedure is as follows: A thin sheet of clear celluloid coated with bichromated gelatine is exposed under the triple negative. The resulting print, which shows the three images in a delicate brown colour, is placed in hot water, which dissolves away all the gelatine that is not rendered insoluble by the action of light, and leaves the image in very low relief in transparent gelatine, the shadows of the picture being represented by various thicknesses of gelatine, and the extreme high lights by clear celluloid.

The positives are next coloured by the following method. The three images are cut apart, and each one is coloured up by soaking in a solution of a dye the colour of which is nearly complementary to the fundamental sensation which that image represents. The dye is taken up by the gelatine in proportion to its thickness. The coloured prints are superposed so as to bring the three images into register and make them appear as one, and, if, says Mr. Ives, the deepest shadows are then a neutral black, the colours should be right throughout all the shades of the picture, and will be, if the correct printing colours are used and the known theoretical conditions of success adhered to. The three celluloid positives are finally cemented up between cover glasses with Canada balsam, and fastened by a paper binding at the edges.

It will be observed from the foregoing that the production of the colours depends on a dyeing action of the gelatine. The colours, however, may be produced without the *direct* use of dyes, but to this process we shall not on the present occasion allude. We may, nevertheless, state that to those who have given this subject close attention it is probably an obvious system of working.

Natural colour transparencies by the above method are not, Mr. Ives assures us, over-easy to produce; but, when properly made, we can testify to the beauty of the results. We trust we have said sufficient to satisfy our correspondent and others that the production of what is apparently a single transparency in colours is not the novelty it is supposed to be.

Geological Photographs.—The Photographic Committee of the British Association state in their report that they have received about two hundred new geological photographs during the year, but that still many portions of the British isles are wofully ill-represented in the collection, which, although now lodged at Jermyn-street, still hopes to receive marked increases during the next few years. We are sure that there must be many of our readers who would willingly devote time and trouble to furthering the objects of the Committee, if they possessed full details as to what was wanted, and in what form.

A New Mode of Dehydrating Alcohol or Ether.—According to a German scientific journal, aluminium amalgam is very serviceable for this purpose, as it reacts with the water to the production of hydrogen gas, which escapes, and the insoluble hydroxide of aluminium, which can be removed by filtration or

decantation. To prepare the amalgam, aluminium turnings, freed from oil, are treated with soda lye until a strong escape of hydrogen occurs. The surface is then rinsed with water, and treated for two minutes with a half per cent. solution of bichloride of mercury. These operations are repeated after a short time. The preparation is then quickly washed with water, alcohol, and ether, and the product kept under petroleum ether.

Miniature Painting.—On Friday last the Princess of Wales, with the Prince and Princess Charles of Denmark and the Princess Victoria of Wales, paid a visit to the Exhibition of the Society of Miniature Painters, in New Bond-street. We understand that this Exhibition, as regards visitors, is a success. If the attempt now being made to resuscitate miniature painting proves successful, it should also create a demand for good coloured photographic miniatures, such as used to be done five-and-twenty or thirty years back. In the Daguerreotype days, the well-to-do public were pleased to pay half a guinea to a guinea, or more, extra to have their portraits coloured. A good trade was also done in coloured glass positives, from one shilling to ten being charged extra for the colouring. The colouring of small photographic portraits, however, seems almost to have died out of late years.

Dark-room Ventilation.—In a general way the need for ventilating the dark room has been so often dwelt upon that it has gone beyond the realms of discussion; but, to strengthen the hands of those who demand its universal application, it will be well to draw attention to a particular phase of it which is, to some extent, novel. In coal gas there is always a certain amount of carbonic oxide, and also, when gas is imperfectly burnt, some of this gas is sent into the atmosphere among the products of combustion. This and leaky joints might lead to the constant presence of a small amount in the air breathed in the usually small apartment. At the recent British Association meeting, Dr. Haldane explained that the continued inhalation of small portions of this gas is much more dangerous than the momentary reception of a large quantity of it in the lungs. The best antidote is the inhalation of oxygen. It has been found that, when more than thirty per cent. of the blood has been saturated with the gas, violent motion will bring about collapse.

Broken Plates.—The judgment given in the Sheffield County Court, reported in our last issue, seems a little anomalous. The plaintiff sued for the value of plates supplied. The defence was that the plates were delivered by the railway company smashed to atoms, owing to insufficient packing and labelling. The railway company refused responsibility in the matter, as the package was not labelled glass. In the result the Judge gave his decision in favour of the plaintiff for the amount claimed, and gave the defendant leave to commence an action for damages against the plaintiff, or the railway company, for the breakage, as he may be advised, he having received nothing of any value for his money. It is possible that, had the case been tried by another Judge, the ruling might have been different. However, in a case of this kind in the future, we should advise the plaintiff, and any of our readers, to refuse to receive a parcel when broken glass can be heard within. Then the sender will have to fight the matter out with the railway company.

Chloride Papers.—A writer in a contemporary, in giving his observations on the state of photography at the Antipodes, says very few were using chloride papers; most were content with their old and tried friend albumen. On reading this, one is naturally led to ask if albumen is not a chloride paper, and quite as much so as a collodio-chloride or gelatino-chloride one? With albumen the image is formed on chloride of silver, just the same as in the other two papers named, the only difference is in the vehicle holding it, and that with collodion and gelatine the chloride of silver is held in suspension as an emulsion when applied to the paper. In the case of albumen, the vehicle is salted with a chloride, and the chloride of silver is formed by double decomposition when the paper is sensitised on the silver bath. We allude to this matter because some novices in photography—and not a few—seem to imagine that albumen paper is simply paper coated with plain white of egg and sensitised on a silver bath. Of course, this remark only applies to those, and there are many, who have never taken the trouble to read even the most elementary work on the theory of the art they practise.

On the Nature of Röntgen Rays.—Professor A. Róiti continues to publish accounts of his investigations on what he term cryptochroism, which is equivalent to colour in Röntgen rays. Experimenting on the transparency of metals, he found two sheets of brass of a certain thickness were equivalent to eight of aluminium; but other combinations of the three metals did not follow proportionately, thus proving that rays which have traversed a metal plate are, in some way, different from the rays that come direct from the Crookes' tube in respect of their penetrating power upon other metals, or even the same metal.

The Most Recent Application of Röntgen Rays.—A correspondent of *La Nature* is responsible for this latest sensation. He writes to that journal that an American, having secretly purchased some fragments of an Egyptian mummy, his friends began to cast doubts on its genuineness. One of them even went so far as to say that the mummy's hand, or so-called hand, was merely a well-shaped imitation in resin, covered with pieces of stuff borrowed from mummy rubbish, upon which the finger nails had been cleverly arranged. To verify the real state of affairs, and without destroying the hand and foot, for which he had, no doubt, paid dear, he had them radiographed. The experiment succeeded, to the joy of the antiquary and the confusion of the sceptics. The presence of the bones was revealed with the utmost sharpness, and the authenticity of these thirty or forty century-old human documents satisfactorily established, thanks to Röntgen's discovery.

Reversed Röntgen Photographs.—In reference to the experiments of Mr. Espin, described in our last, the following reply appears in the Journal from which we extracted (the *English Mechanic*) the description by Mr. Espin himself, who has done some interesting and valuable work in the byways of X-ray work.

THE following experiments are, I believe, upon the lines suggested by Mr. Espin in his letter.

"(1) Upon the left-hand half of a film, washers, discs, &c., were placed, the other half of the film was secured by a sheet of platinum; an exposure of one minute was given, and then the metal objects were rapidly shifted to the half of the film which had been screened from the rays, and left there for a minute. Upon development, a sharp negative was got on the left hand of film (as was to be expected), the other half was blank.

"(2) The above arrangement was again made; but, after moving the objects to the right hand of the film, the left was screened to prevent fogging, and another exposure of one minute given. Result: two sharp negatives.

"(3) Placing objects *under* film, and on metal sheets under film: no result.

"(4) Making exposure of two minutes, then moving object to right-hand (unexposed) half of film, and leaving them for twenty minutes. Result: negative only on left side."

Has Mr. Espin found it possible to get a negative and a positive each time an exposure is made, when film, objects, and tube are arranged in a manner identical with their disposal when he first obtained these curious results?

While upon the subject, a tube I have in which the vacuum is very high, owing to use, can be excited with powerful currents and slight heating. The screen is then brilliantly illuminated, and, if the hand is placed behind, there is scarcely any diminution of fluorescence, the hand and bones being scarcely visible, the rays apparently passing *easily* through the bones. By further heating the tube the bones are seen more plainly, but with nothing like the distinctness with which they stand out when one of my other tubes is used.

While experimenting, I have so frequently been impressed with the difference of results obtained from different tubes, that I should be interested to hear whether Mr. Espin has noticed any difference in screen work while using the tube he worked with when he got the results he describes. These results may be due to some alteration in the rays.

F. J. R.

An Interesting Case.—A case of interest, in more ways than one, to photographers was tried in the Westminster County Court by his Honour, Judge Lumley Smith, on Wednesday week. Mr. Mendelssohn was the plaintiff, and a Mr. Aspinall the defendant. The claim was for nineteen guineas, being fifteen guineas for the right to reproduce a copyright photograph of Madame Patti in an advertisement of a specific for beautifying the complexion, and four guineas for a block. The smaller sum was paid into court, but the larger one was disputed on the ground that for the fifteen guineas the defendant expected to get the negative as well as the exclusive right to the photograph, as Madame Patti had referred him to Mr. Mendelssohn. In the end the judgment was for the amount claimed and costs, his Honour remarking, that the defendant paid for the right to use the photograph, and no one had interfered with his right.

During the examination, and cross-examination, some interesting facts were elicited. First, it is evident that Madame Patti has no objection to her portrait being used in connexion with toilet requisites. Next, that it cost the plaintiff 100*l.* to go to Madame Patti's residence in Wales, and back, to take the photographs, and that he gave her three dozen portraits free of charge. In cross-examination the plaintiff said that Madame Patti paid him 458*l.* for copies of the photographs she ordered, and photographs of M. Nicolini, views of Craig-y-nos, and the district. He also said that this is not a large sum for photographs. Of course, no photographer would consider any sum too large for photographs, but we do happen to know a good many who would like to have such a business line just now, and who would not object to its being repeated, if only occasionally.

Fatal Explosion of Acetylene Gas.—On Saturday last, according to a Reuter telegram, two men lost their lives, and a third was injured, at the Picket Works in the Montmartre district of Paris by the bursting of an acetylene gas cylinder. One of the unfortunate men was cut in two, and one of his arms was torn off and found lying a dozen feet from the rest of the remains. The body of the other victim was also torn to pieces. The walls of the building were blown down, and neighbouring buildings were much damaged. The report of the catastrophe is meagre, but it is stated that it occurred in the gasometer room, which is a special and spacious building separated from the main portion of the factory. It is said that the men were engaged in checking a number of holders that had recently been returned, and were supposed to be empty. The report says that the remains of the two victims were covered with fine carbon dust, and the effects of the explosion were similar to those of dynamite.

It is unfortunate for the immediate future of acetylene that its advent should be accompanied by this disaster, and one of a somewhat similar nature, if we remember rightly, in America a few months back. It is well understood that acetylene gas, like coal gas, hydrogen, vapour of ether, benzoline, &c., forms an explosive compound when mixed with a certain proportion of air. Only a few weeks ago a lady was killed, and another injured, at Hull, through some boys, in playing, applying a lighted match to an empty benzole drum. Until fuller details are given it is, of course, impossible to hazard an opinion as to what led to the explosion in Paris, but its unfortunate occurrence, whatever the cause, will certainly not tend to inspire confidence in its safety, in the compressed form, for the lantern. There is, however, a vast difference in employing the gas for cylinders, and using it from the portable apparatus now in the market in which the gas is consumed as fast as it is generated.

JOTTINGS.

The "usual thing" of the photographic autumn has, of course, happened. I allude to the annual squabble, the Linked Ring and the Salon *versus* the Royal Photographic Society and its Exhibition. I am sorry to say that the Salon young men's way of trying to persuade people that the Piccadilly Exhibition was started in the interests of pictorial photography, and not to rival and damage the Royal Exhibition, lacks both dignity and generosity. Sneers at the Society's charter, at its name "Royal," and at its Fellowship—concerning which there appears to be an odd delusion that it is to be had as easily as, let us say, membership of the Linked Ring—make light and amusing reading, it is true, but in what way they help the Salon or pictorial photography I fail to perceive. Again, the mild mendacity of the statement that the Royal Photographic Society's Exhibition is entirely a "scientific" one—the Linked Ringers appear to have hit upon this choice morsel of affectation and impertinence as a kind of battle cry this year—forms a fitting companion for the pitiful fiction, now being circulated, that it is an "honour" for an exhibitor to have his photographs hung at the Dudley Gallery. The sooner this kind of thing is stopped the sooner the Photographic Salon, which, as an exhibition, is at least good enough to be judged and to win success on its merits, will earn the sympathy and respect of many who at present are sickened by the attitudinisations, the log rollings, the mutual admiration, and the childish carping at the Royal Photographic Society, in which some Links permit themselves to indulge.

For several years, at the Society's Exhibition in Pall Mall, the proportion of "commercial" work shown has been on the decrease; and this year, as every one knows, it has dwindled down to nothing. It would appear that the time when professional photographers made, sustained, and enhanced their reputations at Pall Mall has departed, and that exhibits of a "commercial" nature no longer stand much chance of being accepted and hung there. In this one respect the Society has, perhaps, moved too fast. To comply with the requirements of pictorial portraiture, as it is understood by modern selecting committees, is possibly not in the power of the photographers who were once pillars of strength to the Exhibition; and so they have to stand out. "Pictorial" portraiture is all very well in an exhibition; but is there one sitter out of a hundred that would tolerate it, much less pay for it? It is fortunate that the smaller London exhibitions, and those in the provinces, do not debar "commercial" work, otherwise it would be a bad look out for professionals anxious to get the chance of having their work publicly shown, adjudicated upon, and criticised.

Of course, the sympathy I here express for "commercial" photography and photographers will not be shared by the superior young gentlemen above alluded to, who are so uncommercial as to send their photographs to an exhibition where medals are not awarded, but which, nevertheless, gives them an opportunity of selling those photographs several times over, and charging one, two, three, or four guineas a copy. This is not commercialism, I suppose? Nevertheless, I know that many thoughtful men deplore with me the tendency there is to lose sight of the fact that photographic exhibitions are intimately bound up with the bread-and-butter side of photography.

A visit to the Exhibition in Pall Mall was once looked upon as an annual duty by numerous professional photographers, who went to see what their rivals and competitors were doing, and profited accordingly. I should not be surprised if the highly "artistic" character of the present display did not finally alienate many professionals from this traditional habit. I have certainly heard many express themselves both puzzled and disappointed at the great swing the pendulum has made. "Where are the photographs?" has been the mournful question often asked. Well, well, "the old order changeth, giving place to new," even in photography. So there's an end of it.

The awards at Pall Mall appear to have given satisfaction—indeed, not for many years has there been so little grumbling or surprise at the Judges' decisions. In the technical section, however, one exhibit was passed over which I certainly think should have marked itself out for judicial recognition. I allude to the Stigmatic lens. This is a lens which is claimed, at an aperture of *f*-4, to embrace an angle of 60°, over which it is said to define perfectly, while the field is flat, and both spherical aberration and astigmatism are eliminated. Compared with the Petzval portrait lens—the nearest approach to

the Stigmatic as regards angular aperture—Mr. Aldis's lens, if it possesses the optical properties that are claimed for it (and there is no reason to suppose that it does not), constitutes a really remarkable advance in lens construction. It would, therefore, be interesting to know why the Judges passed it over; the more particularly as the same Judges last year awarded the medal to a lens for which—admirable instrument though it may be—far less important optical claims were made than are made for the Stigmatic.

Mr. Bennetto, of Newquay, Cornwall, still declines to dance to the music of this JOURNAL, and state how he produces his so-called photographs in natural colours. I should think Mr. Bennetto is rather sorry he made a confidant of the local journalist who announced in his best local journales that, "after seven years of experiment," &c., "our well-known fellow-townsman" had found out how to take photographs in natural colours. It cannot be pleasant to Mr. Bennetto to know that his claims are doubted and received with scepticism; but for this he has only himself and his precipitate journalistic friend to thank. A still tongue makes a wise patentee. Personally, I hope Mr. Bennetto has made a genuinely original discovery, out of which he will profit. I also hope he has familiarised himself with what has already been done and achieved in the way of colour photography. It would be most mortifying to him, I'm sure, to discover that, after all, he was not the first in the field with the particular method he was working; and, reading between the lines of what has appeared on the subject in these pages, I should not be surprised if this did not prove to be the case. COSMOS.

THE THEORY OF DEVELOPMENT.

[London and Provincial Photographic Association.]

IT is not my intention to advocate any particular form of development. I wish to speak entirely theoretically of what takes place during the development of the image. It is a curious state of things that this, one of the most important operations in the practice of photography, has received far less attention, from the chemical point of view, than anything else.

When I started photography, we had one developer, gallic acid, which was used in the calotype and waxed-paper processes, and there was then some excuse for no theory being advanced as to its action on the sensitive film; but, as time went on, we got pyro and sulphate of iron for physical development, and lately the number of developing agents at our command has been greatly increased by the advent of amidol, metol, &c. Pyro, being that in most general use, will be the one I shall speak of, but the same theory applies to all.

A little light was recently thrown upon one action of pyro by Mr. Haddon, who pointed out that pyro itself exercised no tanning action on gelatine. I will go further, however, and say that there is no tanning action even with oxidised pyro, and might also say that pyro is not a developer. It is a fact in chemistry that any partially oxidised substance is always greedy for further combination with oxygen, and if we notice the construction of pyrogallic acid, which is $C_6H_3(OH)_3$, it will be seen that already three of its atoms are oxidised, and it is, therefore, very suitable for use as a developing agent on this account.

If we take pyrogallic acid, and apply it to an exposed plate, what takes place? First, the bromine is liberated wherever light has acted, and it is this liberated bromine, and not the pyro, which tans the gelatine. If pyro were a tanning agent, then such a process as Warnerke's, where the plate is developed with pyro, and then placed in hot water when that part upon which light has not acted, and where there has been no development of an image, is dissolved, would be impossible. I hold the theory that it is the nascent bromine that tans the gelatine.

If a plain gelatine plate is soaked in a solution of pyro and ammonia for several hours, and then put in hot water, it will melt readily, proving that, although subjected to the action of oxidised pyro, no tanning action has taken place. I know that old notions are hard to get rid of, as is the so-called rising and setting of the sun, which is only illusive. Things are not what they seem, and this tanning action, though appearing to be produced by pyrogallic action, is not due to it.

Now, as to the development of the image, what is the constitution of the image in the plate? It has been said that the undeveloped image in the plate consists of silver sub-bromide; but silver sub-bromide has never yet been proved to be present, and there is no evidence that silver sub-bromide has been made except once by the German chemist, Guntz. It has been assumed that it exists, but no proof can be given. The change to silver sub-bromide I consider ought to be visible if existent, and I hold that the phenomenon of development can be accounted for without the supposed change to sub-bromide. In the development of a plate the operations, which are well known, consist in pouring the pyro solution into the dish or vessel containing the plate, when the image gradually appears till sufficient intensity is obtained, when it is stopped by various means, such as plunging in water &c. What is the action which takes place, and what part of the pyro does the work? Pyro contains three oxidised atoms of hydrogen and three atoms of hydrogen unoxidised and waiting to be oxidised. It is generally thought that the hydrogen of the pyro develops the picture, but it is not so. The plate contains bromide of silver, consisting of bromine and silver in equal proportions, and the atoms of each are arranged in a definite order upon the plate. We are taught that all atoms are free to move, so the atoms of bromine and silver are free to move, and the action of light is to move these out of their position, and they are, as it were, polarised. There is no evidence that the bromine is given off, but the position of the atom is changed. I consider the action of light simply causes a rearrangement of the atoms.

In the Daguerreotype process we have a copper plate which is coated with silver by electrical deposition, which receives a high polish. This surface is exposed to the vapour of iodine and bromine, which produces a sensitive film. After exposure, this is developed by subjecting the surface to the vapour of mercury, when the mercury combines with the silver of the exposed portions, forming an amalgam. But there is no evidence that a sub-iodide or sub-bromide of silver is formed. In the modern plate the case is somewhat similar, but the results of the application of the various developers are different. Every one present has, no doubt, experimented with the simple form of galvanic battery, made of simple elements of zinc and copper, which, when properly coupled, give a current of electricity, and has noticed that the action only lasts a short time. This is due to the plates becoming polarised, or, in other words, the hydrogen of the decomposed water adheres to the negative element and prevents further action. In Daniel's battery, which gives a constant current, the negative element is immersed in a solution of sulphate of copper, and the evolved hydrogen is used in reducing the copper from its combination with sulphuric acid, and thus removed.

In development there is a similar process going on. You have the atoms of silver bromide which have been acted upon by light on the one side, and the hydrogen atoms of the pyro on the other. A weak electric current is established, the water becoming polarised and presenting its hydrogen atoms to the negative element, silver bromide, and its oxygen atom to the positive hydrogen of the pyro. The immediate result is the decomposition of a molecule of water, the hydrogen of the water, not of the pyro, combining with the bromine of the silver bromide, thus reducing the silver to the metallic state, hydrobromic acid being formed. The oxygen of the water combines with the hydrogen of the pyro.

A plain solution of pyrogallic acid will exert some developing action on a plate, but this action is very slight. Here we have hydrobromic acid formed immediately reduction takes place, and nothing to combine with it and remove it. When an alkali is also present in the solution, the alkali combines with the hydrobromic acid as soon as it is formed, and the development is continuous.

Some years ago I experimented with the view of developing by water alone, and after many failures succeeded. I prepared a copper plate, coated with collodio-bromide emulsion, and exposed it in the camera in the usual way. I then placed the copper plate in water, and also a zinc plate, and caused them to touch at the edges, when I got a faint image. For example, in a landscape subject, the sky would perhaps appear, but with very little detail. In a further experiment an ordinary gelatine emulsion plate was used. After exposure the film was stripped from the glass, and transferred to a plate of silvered copper. This was immersed in distilled water, with a slight trace of alkali-ammonia. A zinc plate was also immersed, and caused to touch the copper plate, and the picture which I pass round was produced.

Temperature has an influence. If the water be intensely cold, scarcely any development is possible, while, as the temperature is raised, so the action increases.

There is nothing written as far as I know as to what is the result of developing on the developers themselves. It seems a very obscure point. The probability is that the first stage of oxidation of the pyro is the formation of a brown purpurogallin, any further oxidation causing the carbon molecule to fall to pieces, thus liberating carbon in the film in the form of the well-known pyro stain. EDWIN BANKS.

OPTICAL DIAGRAM OF A DOUBLET LENS.

THE diagram of an ordinary doublet lens which we illustrate this week is the natural sequel to Mr. Hett's diagram of tele-photographic lenses published in our issue of March 27 last.

Mr. Hett says:—

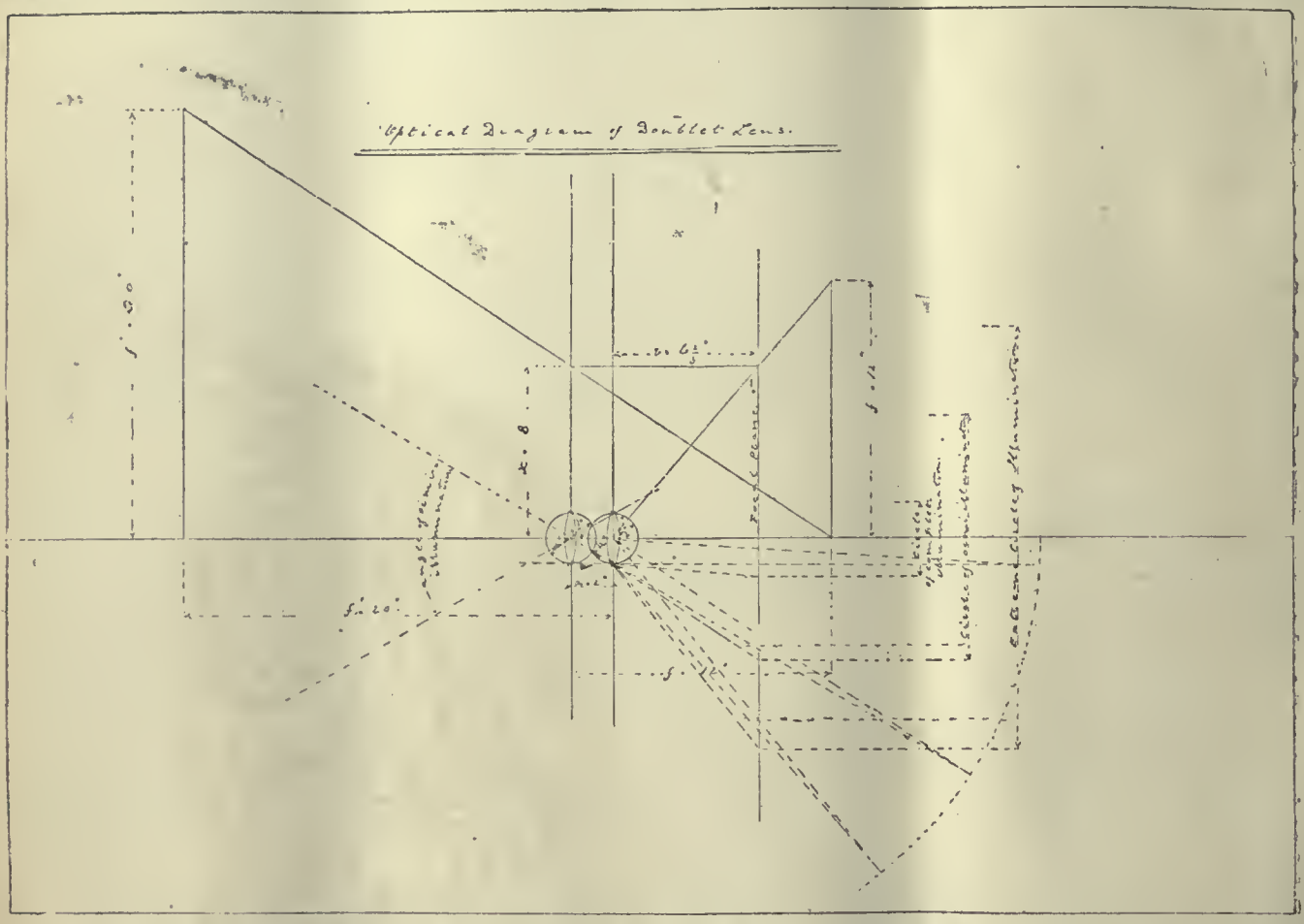
"In this figure the various data are as follows:

Focus of front lens	= 12 and is represented by			f
Aperture of "	= $2\frac{1}{2}$	"	"	a'
Focus of back lens	= 20	"	"	f'
Aperture of "	= $2\frac{1}{2}$	"	"	a''
Distances of lenses apart	= 2	"	"	a

"Found by construing,

Equivalent focus	= 8"	"	"	x
Back focus	= $6\frac{2}{3}$"	"	"	v

"The circles of complete and semi extreme illumination shown, as well as the angle of semi-illumination, are modified by the use of stops. Perhaps it may be well to explain how these circles are arrived at. As an example, I take the circle of semi-illumination (this is not shown accurately), and take a pencil of light passing through the centre of the front lens and the extreme edge of the aperture of the back lenses, and finally cut an area of a circle struck with the radius $f' = 20''$ from the centre of the anterior



lens. The point in the arc where the junction is taken is covered to the centre of the anterior lens by a straight line, parallel to which the pencil of light will emerge from the back lens. This is drawn in, and the point where it cuts the focal plane is in the circumference of the circle of semi-illumination.

"The other portion of the construction is, I find, self-explanatory."

CARBON PRINTING WITHOUT TRANSFER.

At the present time, when considerable attention is being directed to this paper, it may be of interest to give a *précis* of the chapter upon this subject which appears in the new work (*Das Pigmentverfahren*) by Dr. J. M. Eder.

It is curious to note that the earliest of all carbon processes, patented by Poitevin in 1855, contained the germ of this process, and that it was also used by Pouncey in 1858.

In 1885 Mariot had introduced into the K. u. K. Militargeographischen Institute in Vienna a somewhat similar process for line work, really for the reproduction of maps and charts, but it was not till 1889 that Artigue, an amateur photographer of Bordeaux, showed some prints at the Paris Photographic Exhibition, which were remarkable on account of the delicacy of the half-tones, the great depth of the shadows, and for the fact that they were prepared without transfer.

It was not until 1894 that Artigue placed his paper on the market, and considerable difficulty was experienced in obtaining it.

Artigue paper is essentially a gelatinised or well-sized paper, coated with a thin film of gum arabic, containing a lot of some pigment—usually lamp-black—which is, when dry, sensitised from the back. After exposure, it is developed with a somewhat thick paste of sawdust and warm water, the development being partly due to mechanical attrition of the unexposed and still soluble gum, and partly to solution of the same in the water.

Mariot's process, which is specially suitable for line work, is as follows: Good raw paper is first gelatinised by being drawn through a 1:60 solution of gelatine, and then dried and coated with a mixture of—

Gelatine	60 grains.
Gum arabic	60 „
White sugar	120 „
Distilled water	1 ounce.

The gelatine should be soaked in half the water for an hour, and the gum arabic in the other half, and the latter be well stirred till dissolved, the two solutions mixed, the sugar added, and the whole heated till perfect solution is effected, and then the solution filtered through linen.

The previously gelatinised paper should be first soaked in water till the gelatine has swollen, then the paper laid film down on a sheet of glass, and excess of water removed with a squeegee, and then turned film up and the above solution spread over it with a leather roller. It has been found that an ordinary indiarubber squeegee may be used instead of the leather roller. The paper should now be laid over a wide shelf or semicircular piece of wood till just the surface moisture goes and the film is still tacky. It should be then placed in a dusting box, such as is used for photogravure, the powder being a mixture of—

French lamp-black or vine-black	5 parts.
White sugar	100 „

The paper must be left in the dusting box for from eight to twelve minutes, or till it is uniformly covered with an even coating of powder, and shows quite black and opaque. The paper is then dried, and can be kept for a long time in this condition.

To sensitise it, the sheet is lightly dusted with a cloth or soft brush, and then immersed in the following:—

Potassium bichromate	50 grains.
Ammonium	50 „
Distilled water	14 ounces.

When dissolved, add

Strong solution of ammonia	*Quant. suff.*

That is until the colour turns a bright yellow, and then add:—

Chromic acid	20 grains.
Alcohol	3½ ounces.

After sensitising, which takes two or three minutes, the paper is dried, exposed, and developed in warm water, and finally sprayed with cold water.

Another process of Mariot's for the same purpose is the following: Paper must be gelatinised as described above, and then coated with the following mixture:—

English red	26 grains.
Indigo	10 „
Vine-black	5 „
Gum arabic	20 „
White sugar	24 „
Potassium bichromate	18 „
Distilled water	1 ounce.
Caustic ammonia	20 minims.
Chromic acid	5 grains.
Glacial acetic acid	30 minims.

The indigo should be rubbed up with alcohol and burnt, and then mixed with the other colours and sugar in a mortar with a little water, and the water allowed to evaporate. The gum arabic, which should be in powder, should be rubbed down with one or two drops of alcohol, and the potassium bichromate, previously dissolved in the water, added gradually with constant rubbing in the mortar, and this gradually added to the colours, and then the caustic ammonia, the chromic and glacial acetic acid added, and the whole pressed through linen, and the previously gelatinised paper coated with this in the dark, dried, exposed, and developed in water at from 35° to 70° C., then well washed with cold water, preferably with a rose, and dried.

Although no formulæ for the preparation of Artigue's paper have been published by Artigue himself, several others have suggested working formulæ. Duchochois suggested the following:—

Glucose	20 minims.
Sugar	10 grains.
Honey	5 „
Gelatine	10 „
Water	1 ounce.

Dissolve by the aid of heat, and add 180 grains of lamp-black previously rubbed down very fine with alcohol. The paper is coated with this, dried, and then sensitised by brushing with a two and a half per cent. solution of potassium bichromate.

Another process suggested by Duchochois is to use a fluid starch paste and incorporate the colour, and then spread thinly on paper, and, when dry, sensitise from the back.

Dr. Mallman suggested coating damp Rives paper with a one or two per cent. solution of gelatine, allowing 0·32 c. c. to every ten square centimetres of surface; then, when this was set, dusting with ivory-black and sensitising by immersion in solution of potassium bichromate.

Watzek, of Vienna, recommends the use of a not too rough drawing-paper, which should be previously sized with starch. The sensitive mixture is composed of the volume of the pigment (lamp-black, burnt sienna, Indian red, English red, Paris blue) and one and a half volumes of a forty per cent. gum arabic solution, to which sufficient of a ten per cent. solution of potassium bichromate is added. With moist-tube colours, Watzek uses equal parts of colour, gum solution, and bichromate solution.

Rouillé-Ladevèze, in his little work, *Sepia-photo et Sanguine-photo*, (Gauthier-Villars, Paris, 1894), recommends the following solutions:

1. Pure gum arabic	192 grains.
Water	1 ounce.
2. Potassium bichromate	48 grains.
Water	1 ounce.

Mix in equal parts, allow to stand for twenty-four hours, and then filter through linen, and add the pigment in the form of a paste, allowing twenty-four grains of colour to every ounce of the above mixture.

Whilst the preparation of the bichromated gum presents no particular difficulty, I have found that it is by no means easy to ensure absolute evenness of coating if the colour be incorporated; and, whilst I have a heliogravure dusting box, there was considerable unwillingness on my part to clear out the asphalt and utilise it for pigmentary colours for this process, and I therefore looked about for some means of dusting on the powder, which should be simple and not costly.

Dredging the colour on from a box is simple, and almost costless, for a round card box, such as used for collars, was obtained, the lid removed and knocked out of the rim; in the box the colour was placed, and over the top was tightly stretched some of the finest muslin, and the rim of the lid jammed on to keep the muslin taut. Now, by tapping and shaking the brush, the colour was easily powdered all over the surface of the paper; but, as fine muslin was used, it took some considerable time, with the result that one end of the paper became less tacky, and therefore showed less vigour or development. The substitution of coarser muslin produced a somewhat lumpy or coarse granular deposit, and therefore some other method was looked for.

The first thing which suggested itself was one of the small powder bellows, such as are used for insecticide powders, but this was found to give a coarse, lumpy deposit, and was given up. An ordinary scent diffuser was tried, but this was found useless, as the pressure of the ball was not sufficient to force the powder from the bottle. It then occurred to me that an insufflator, such as is used for blowing powders into the throat or the nostrils, might be used, and this has given excellent results.

The insufflator I used consists of two indiarubber balls, one a pump, the other an air reservoir connected with an ebonite pipe, into which, by means of a sliding piece, the powder is placed, whence it is carried by the pressure of the air. These can be obtained with various nozzles or nipples, to give either a narrow stream or a diffused spray, and the latter is to be preferred.

Whilst many operators have commended the total immersion of the paper, it is not, in my opinion, so favourable as painting the back of the paper, nor do I commend the combination of the bichromate with the pigmented gum, for, as is well known, in this state the paper will not keep. To sensitise the paper, it is advisable to support it on a sheet of glass slightly smaller than the sheet of paper, in order to prevent the sensitising from creeping on to the surface, which must be next the glass.

The concentration of the sensitiser may vary from one to five per cent.; the more concentrated it is, the harder the prints. Von Schöller, whose picture at the Pall Mall Exhibition has been medalled, recommends soaking the exposed print in cold water first, taking care to avoid air bubbles, and then placing in water at from 25° to 27° C., till the outlines appear, then laying on a sheet of glass and developing with the usual sawdust and water at 20° C. The hotter the water the greater the contrast in the prints, and, by careful manipulation with a soft brush and water at various temperatures, very great command is to be exercised over the results.

A. D. Pretzl.

PHOTOGRAPHY AND THE BICYCLE.

[Journal of the Photographic Society of India.]

With the rapid spread of bicycle riding among all classes throughout the world, there must be many photographers who desire to take advantage of the peculiar facilities for rapid and independent locomotion afforded by the bicycle to secure pictorial mementoes of their rambles in strange places.

The tricycle has long since been adapted to the carriage of the photographer and his kit, and apparatus of a fairly large size can easily be taken without any inconvenience beyond the extra weight to be propelled. The bicycle does not, however, offer the same facilities as a luggage carrier, and the amount of kit to be carried is much more limited, both in size and weight, besides which the question of *balance* and comfort in riding long distances have to be considered. Still, with the improved small hand cameras now available, much may be done.

The year-books, to which one naturally looked for information on this subject, scarcely deal with it; but, in a little French book entitled *Le Photo-cycliste*, published by the author, M. Georges Lanquest, at 1, Rue Gay-Lussac, Paris, we find a full discussion of the question of apparatus, dress, &c., together with a lot of hints and dodges and useful information, both for the cyclist and the photographer, male and female, or, as our author calls them, the "photocycleman and "cycleswoman." We can here only indicate the general principles advocated by the author, leaving those interested to refer to the book for further information.

The first question to be considered is the apparatus, which must

necessarily be limited in weight and bulk, and should ordinarily not exceed quarter-plate size, though with films a larger size may be taken for a short run or for any special purpose. A small, light, magazine hand camera of simple construction is the most suitable, and should be fitted with a first-class lens, so that the pictures may stand considerable enlargement. It should be strongly made, well put together, and packed in a strong light outer case or waterproof cover, so as to avoid injury in case of a fall and be protected from rain, dust, and heat. A light folding stand may be carried strapped to the frame, but can well be dispensed with if the bicycle itself is used as a stand, the camera being attached by a clamp screw to the handle bar.

As regards sensitive plates, celluloid films, either cut to size or in a roller slide, are undoubtedly the lightest and most convenient; but, if glass plates are preferred, the number that can be carried on the machine must depend upon the size of the apparatus. Some dozens of plates one and a half to two inches square could be carried without inconvenience, while more than a dozen or two of quarter-plates would be difficult to carry without inconvenience and a considerable addition to weight and bulk.

It is obviously not desirable to encumber one's self with extra plates and the requirements for developing or printing *en route*. These, if necessary, should be carried with one's luggage, to be forwarded by train, parcel post, or other local conveyance. If absolutely required, a few small graduated bottles of concentrated developer and fixing solution may be taken, together with a couple of celluloid trays distinctively marked, one for developing and the other for fixing. Developing and fixing cartridges or tabloids would also be found convenient. The bicycle lamp can readily be made to serve as a dark-room lamp by screening it with a piece of suitable non-actinic paper or cloth. Our author tells how to do this, and also how to improvise a bicycle lamp on occasion. He also goes fully into the details of developing, fixing, and printing negatives, but this we need not refer to further.

Our author also deals pretty fully with the question of clothing, and gives a lot of hints for drying one's things after getting wet and avoiding colds and chills. When taking an extended tour, a change of clothing should be carried on the machine. It should be limited to the necessary requirements, and the garments should, as far as possible, be of woollen material, to avoid chills. A spare pair of shoes or boots should be included. This clothing, together with toilet requisites and spare photographic kit, should be well packed in a waterproof valise or square of mackintosh for protection against wet and dust, and may be carried attached to the handle bar of the machine and above the camera. On the top is the waterproof cape, which should never be omitted. On an extended tour in out-of-the-way places, a few simple medicines may also be taken (for these tabloids will be most convenient, though not mentioned by our author); but it will also be desirable, in any case, to carry a small graduated bottle of alcoholic solution of corrosive sublimate, about 1 to 100. One part of this in ten of water, or better spirit, say whisky or brandy, forms a useful antiseptic application for cuts and wounds received in falling on dirty roads. The wound should be well washed with this, and then protected with sticking-plaster or cotton-wool—or a little vaseline may be rubbed on. A five per cent. solution of boracic acid in water is also recommended, and has not the poisonous properties of the mercurial salt. The author says that a solution of permanganate of potash diluted or Condy's Fluid may also be used.

The Machine.—Before starting on a tour the machine should be carefully and thoroughly inspected and all nuts tightened up—the gearing of the chain seen to and the bearings oiled. The tires should be inflated sufficiently but not too much in hot weather, otherwise the expansion of the contained air may cause strain or burating.

At the end of the day's journey carefully clean the machine, if possible, doing it one's self. First wash off the mud with a soft sponge and water, taking care not to scratch the enamel. Dry with a soft leather. Then lay the bicycle down on its side, placing paper or cloth below to prevent injury from rubbing or dirt. Then wash out the bearings of the wheels with a little kerosine oil, turning the wheel all the while till the bearings are quite free from gravel and mud and the oil runs out quite clear. Keep turning the wheels till the petroleum is all out, and then wipe the machine and dry it with a soft leather. Do not let the oil get on to the tires or enamelled parts of the machine. The chain can be greased with vaseline. On starting again, a few drops of oil should be supplied to the bearings. The author also describes how to use a pneumatic tire, and gives a good many hints for the repair and preservation of the machine. The booklet also contains the rules current in France for the running of cycles on the public roads as well as for photographing, and tables of the multiplication and development of machines—according to the size of the wheels and gearing.

In THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1895, M. Albert Levy gives his experience of a bicycle tour from Dieppe to Havre with a camera. His camera, specially made for films 7×5, weighed eight pounds, and he found the best place for it was between the legs, inside the frame, on an aluminium carrier weighing one pound. The tripod he carried across the handle bar, and the six holders in a box behind the seat; a little baggage-carrier in aluminium, to hold necessary changes of linen, shoes, &c., was placed in front of the bicycle. Altogether, his baggage weighed over twenty pounds. The first day he did thirty miles without any trouble, taking a few views; the second day was not so satisfactory, as he had rain; but the third day, running against a high wind, wet through even his waterproof, he managed with difficulty to get to Etretat, where he changed clothes and finished his journey to Havre in a carriage. He concludes by saying: "Photography while riding a bicycle is not always fun, and I understand parties having given it up as not practical. The bicycle is a very good and almost perfect machine for pleasure and exercise, but it is as yet in a very crude state if one wants it for any practical use, to carry some tools along, of any weight, say, from four to five pounds up, and that is small enough; but, as the machine is now constructed, put it where you may, it changes the balance altogether too much."

The subject is one of some interest, and, if any of our readers have practical experience of bicycle photography, we should be glad if they will communicate it for the benefit of their brethren. The important points are the amount of weight that can be carried without discomfort, and the best distribution of it. We are inclined to agree with Mr. Levy that the best position for luggage is inside the framing. The available space is not more than four inches wide, if so much, but a light case made of Willesden cardboard, or aluminium, three inches deep, made to fit the frame, would easily hold a small camera and the necessary clothes, &c. One of the new binocular or other so-called pocket cameras could easily be carried hung over the shoulders. Some of the home makers advertise camera carriers to be fixed on the handle bars.

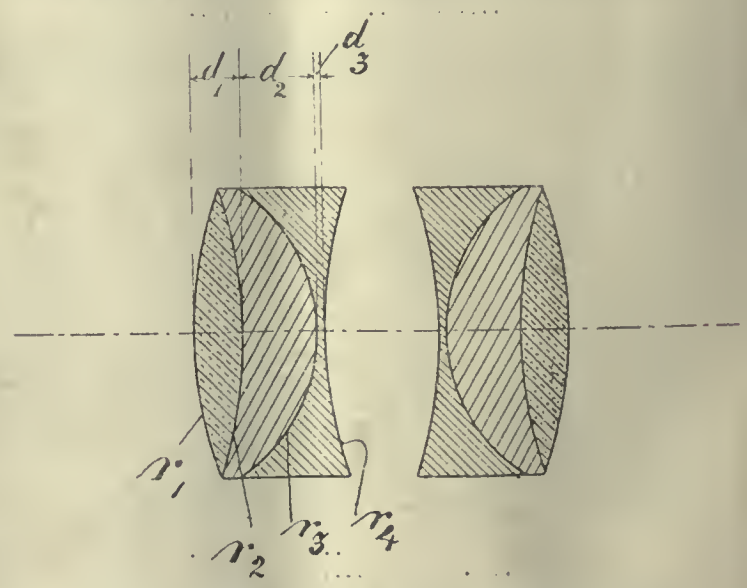
COLONEL J. WATERHOUSE.

VOIGTLÄNDER'S IMPROVEMENTS IN LENSES.

THE patentee, Herr Friedrich Ritter von Voigtländer remarks:—

Since the invention of the unsymmetrical anastigmato-photographic objectives with higher correction of the astigmatic error, it has been the desire of the opticians to construct symmetrical anastigmatical objectives of the same perfection. Such a symmetrical anastigmat, which has been called collinear, and for which letters patent were granted in 1894 under No. 21,458, consists of two equal systems of three bases cemented together in that way, that one positive meniscus of least refractive power lies between one biconvex lens of highest, and one biconcave lens of least refraction. This combination has met with a great success. But, however useful it might be, yet the highest illuminating power of this construction, *i.e.* the highest ratio of clear aperture and length of focus, could never be brought above 1 : 6·3, and so it has been the case with all the other constructions of symmetrical anastigmats.

Recent mathematical researches and practical investigations made it likely that only slight alterations of the optical properties of the medium lens in the so-called "collinear" would afford the possibility of attaining a higher illuminating power. Practical experiments and with the finest precision in the performance of the optical surfaces assisted the mathematical researches, so that I finally succeeded in designing and constructing a symmetrical anastigmatic collinear of the relative aperture 1 : 4·5, twice as luminous as the most luminous symmetrical anastigmat hitherto



known. Only a slight difference of the optical properties of the medium lens made this success possible, whereas any greater alterations lead to impossible curvatures and impossible forms of lenses. This new construction is therefore a most sensitive one, because it is not possible to

neglect the least differences in the optical properties, the curvatures, and the thicknesses of the lenses. This sensitiveness undoubtedly is the reason of all the ill-successes of the constructing opticians in that direction.

In the accompanying drawing, the new spherically chromatically and an astigmatically corrected double-objective of the ratio of aperture 1 : 4·5, is shown in a diagrammatic representation. The precise data of the construction are as follows:—

Species of glasses $L_1 : n_D = 1{\cdot}6065$
$L_2 : n_D = 1{\cdot}5150$
$L_3 : n_D = 1{\cdot}53645$

Radii $r_1 = 54{\cdot}58$ mm. Thicknesses : $d_1 = 6{\cdot}4$ mm.
$r_2 = 59{\cdot}273$ mm.
$r_3 = 22{\cdot}5$ mm. $d_2 = 10$ mm.
$r_4 = 59{\cdot}273$ mm. $d_3 = 1$ mm.

Working aperture : 33·6 mm., Length of focus 151 mm.
Relative aperture 1 : 4·5.

The claims are for (1) a spherically, chromatically, and astigmatically corrected double-objective of the relative aperture 1 : 4·5, consisting of equal systems of the same correction, of which each is composed of a positive meniscus of least refractive power cemented between a biconvex and a biconcave lens of higher refractive power. (2), The employment of a single system of the kind referred to in the first claim as an independent photographic objective.

LAMBERT'S IMPROVEMENTS IN PHOTOGRAPHIC DISHES.

M. Lambert's invention relates to improvements in invertible photographic dishes or baths permitting of the development or other treatment of photographic plates without the possibility of any of the liquid escaping from the dish or bath even if the latter be turned on end or on its side for watching the appearance of the image upon the plate, or even upside down, and also permitting development without fear of soiling the hands by the developing liquid, and without having to touch the plate until after the developing operation is completed.

In the drawing, fig. 1 represents a vertical section on the line 1–2 of fig. 2, of a photographic dish, bath, or basin, constructed in conformity with my invention.

Fig. 2 is a plan view thereof.

Fig. 3 is a vertical section of the edges of the dish, bath, or basin, forming a cover.

Fig. 4 is a vertical section of the base or bottom frame of the basin.

Fig. 5 is a vertical section taken on the line 3–4 of fig. 2, showing the arrangement serving to withdraw the glass plate from the basin.

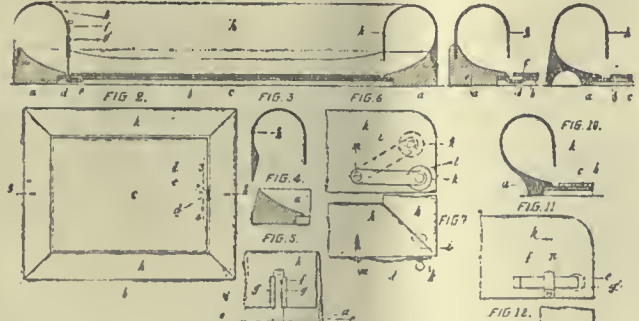
Fig. 6 shows in elevation the device for closing the orifice of the channel for discharging the liquid contained in the bath.

Fig. 7 is a plan view thereof, corresponding to fig. 6.

Figs. 8, 9, and 10 show in vertical sections some modifications of the edges forming the cover of the basin.

Figs. 11 and 12 illustrate in elevation and plan view respectively a modification of the device serving to release the glass plate or the photographic plate from the dish, bath, or basin.

In these different figures similar reference letters refer to similar parts.



The patentee says: "My improved bath or dish comprises principally a frame or base, *a*, of wood or any other suitable material, provided at its bottom with a rebate serving to receive a glass plate, *b*, forming the transparent bottom of the dish or bath; this glass plate, upon which the photographic plate, *c*, rests, is provided with a recess, *d*, in which is located a hook, *e*, on the end of a rod, *f*, mounted in guides, *g*, fixed upon the interior wall of the turned-over edges, *h*, forming the cover of the bath or dish; these turned-over edges, *h*, of aluminium, enamelled sheet metal, celluloid, gutta percha, or any other suitable material, may be of various shapes, for example, such as represented in fig. 3, or that represented in fig. 8, and may be fixed upon the base, *a*, of the bath in any suitable manner so as to ensure a water tight joint in the bath. The said base may sometimes be made integral with the curved edges of the dish or bath as shown in figs. 9 and 10, and the glass plate, *b*, may be without a recess, *d*; in this case, when not in use, the aforesaid hook, *e*, is located in a hollow, g^1, provided in one of the walls of the dish, and the rod, *f*, carrying the hook, is held in place by a small claw, *n*, fixed in any suitable manner on the dish or bath as shown in figs. 11 and 12. When required for use, the rod, *f*, is of course removed, and is employed in a similar manner to the device shown in figs. 1, 2, and 6.

"The base, *a*, is provided with a channel, *i*, for emptying the liquid, the exterior orifice of which channel is closed by a stopper, or washer of indiarubber, *k*, held in place by the action of a spring, *l*, pivoted upon the dish or bath by means of a screw, *m*.

"Fig. 6 shows in full lines the position of the stopper, closing the discharge opening for the liquid contained in the bath, and in dotted lines, this same stopper during the discharge of the liquid. The channel for emptying the liquid may, of course, be arranged at any suitable place, for example at the upper part of the edges of the basin, and may be closed by a screw stopper.

"From the preceding it is evident that the liquid contained in the dish cannot be spilled outside the same whatever position of the dish may be, as the liquid will always flow into the chamber, or recess, formed by the turned-over edges of the dish, *h*, even when the dish is turned upside down.

"The photographic plate, c, resting upon the glass base, *b*, of the dish will be maintained in contact with the same by suction, and therefore the dish may be placed vertically in order to watch, by transmitted light, the development of the image without having to withdraw the photographic plate from the dish, and without fear of spilling the developing liquid.

"After the developing operation is finished, the photographic plate is removed from the basin, for example, by means of the hooked rod, *f*, aforesaid by drawing the same upwards, so that its hook, *e*, will lift the plate, or by any other suitable mechanism, for example, such as represented in figs. 11 and 12, without the fingers having to come into contact with the liquid during the whole operation."

The claim is for the improved invertible dish or bath for photographic purposes, the essential characteristic feature of which consists in providing curved edges to the dish, basin, or bath, so as to form a reservoir enabling the said dish, basin, or bath, to be inclined or turned in any direction, without the contained liquid being enabled to escape or to be spilled.

THE APOTHECARY AS A PHOTO-STOCK DEALER.

[American Journal of Photography.]

A pamphlet has lately been issued and distributed broadcast among druggists, apothecaries, and cross-road storekeepers, setting forth in glowing terms how fortunes are to be accumulated by the sale of photographic supplies. The pamphlet seems to be the effort of one who signs him or herself with the high-sounding title of "Secretary of the American League of Amateur Photographers," an organization which, so far as our own investigations are concerned, we must confess appears to be a somewhat mythical one.

Nor have we been able to locate the headquarters of this great corporation. In fact, the reference smacks greatly of the well-known story of the "Tailors of Tooley Street." However, we will let that pass. No notice should have been taken of the subject, which by the way is marked copyrighted, were it not for the misleading tenour of the contents of the pamphlet, which is really a conglomeration of stale matter, and bears evidence of having been published in the interests of some chemical laboratory for the express purpose of booming their specialties.

Now, this whole matter concerns the inexperienced amateur and the unsophisticated apothecary. It has nothing whatever to do with the professional photographer, photo-scientist, or advanced and intelligent amateur, all of whom are well aware that their success depends fully as much upon the freshness and purity of the chemicals employed as upon the plates and optical appliances, and none of the above need advice from any official of an Amateur League as to what to use or who to purchase from.

It is well known to every professional and intelligent amateur that the regular photo-stock dealer, who is educated to the wants of the profession, has their individual interests at heart, and permits neither plate nor chemicals to leave his place unless he is morally sure that they are fresh and first-class. Further, he has no occasion to deceive his customer, his success in business depends upon them. If either chemicals or lot of plates do not come up to the full standard, they are at once returned to the manufacturer, who in turn replaces them, as the dealer is a large and valued customer.

How different the case with an apothecary who lays in a few dozen plates or a few ounces of chemicals of a kind to retail out by grain or scruple, which, by the way, are apt to deteriorate by becoming stale upon the shelves of such dealers as have but a limited demand for goods of this character. He has no recourse; his only remedy is to sell the chemicals at prescription rates.

A few illustrations which came directly under the writer's notice will suffice. A photographic friend, a few months ago, having use for four

ounces of distilled water and thirty grains of citric acid, sent the order with a bottle to a neighbouring apothecary. The order was filled at a charge of thirty-five cents. It is true the bottle was neatly wrapped in a piece of white paper and tied with a baby-blue string, but that did not make the solution any better.

In another instance, in a different part of the town, three ounces of hypo were called for. The salt was carefully weighed upon a well-balanced scale, not a grain over-weight; this was done up in a double white paper and tied with a pink string and a gilt label. Price 45 cents, or 15 cents per ounce. Upon the purchaser objecting to the exorbitant charge, he was blandly informed that "we only keep pure chemicals." This was supplemented with the information that photo-stock dealers handle refuse chemicals only.

When this case came to our notice a little investigation was started as to prices charged by apothecaries who made a speciality of photographic requisites for amateurs. The result was that hypo brought from five to fifteen cents per ounce. One druggist sold it, put up in packages of one-quarter pound, under his own name as his special brand, expressly for amateur use, for twenty-five cents per package. Three apothecaries had no sulphite of soda, another kindly furnished half a pound of sodium carb. crystals for twenty-five cents.

Even the honourable secretary of the Amateur League of American Photographers quotes an instance where he was let off with twenty cents for a pound of hypo.

He further goes on to state that the druggist is not "in it" so far as concerns present trade relations with the photo-amateur. The writer agrees with him there, and will add that the intelligent apothecary who is wise unto his generation will stay out. He will not be deceived by any suave arguments from agents of concerns who fail to impress the professional bread-winner with the wonderful superiority of their wares, and now seek to unload them upon the village druggist.

The great bulk of photographic supplies will always be used by the professional and commercial branches of the photographic art, who will, as heretofore, look to the reputable stock houses for their supplies.

In comparison with the professional branch, the amateur guild is a comparatively small one; but, even of the latter, the intelligent and painstaking ones will hardly be tempted to enter upon untried or risky paths so far as their supplies are concerned, and cannot be induced to go to an apothecary for chemicals or supplies unless he is caught away from home, or at unawares, in which case he expects to pay prescription prices. Such cases, however, are few and far between, and would hardly justify any retail druggist or apothecary to open a special department of photographic supplies.

J. FOCUS SNAPPSCHOTTE.

The Inquirer.

*** *In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

HYDRIODATE OF POTASH.—NOVICE writes: "I have an old work on photography in which I find a formula containing hydriodate of potash, but I cannot meet with this in any of the dealers' lists. Can you tell me what it is?"—Iodide of potassium.

THE ACTION OF ALUM ON GELATINE.—J. C. asks: "What is the difference between the action of ordinary alum and chrome alum upon gelatine? For some purposes the ordinary alum is recommended, for others chrome alum. Why? Have they different reactions, or may they be used indiscriminately?"

TECTORIUM.—H. P. writes: "In the JOURNAL of October 16, in an article on *Glass Substitutes in Germany*, you mention tectorium, which, I take it, is wire-wove roofing. You say this is an English invention. I have, for some considerable time, tried for the address where this can be obtained. If you can furnish me with this, you will greatly oblige."—We rely on our readers for the information desired.

CLASSES IN PHOTOGRAPHY.—W. D. says: "In reply to your correspondent, 'Snark,' in Friday week's JOURNAL, asking for classes in photography in connexion with the Science and Art Department, as far as I can find out, the Science and Art Department do not hold examinations in photography, so that there are not likely to be any classes in connexion with it. There are, however, classes in photography at the Birkbeck Institute and the South-West London Polytechnic, as well as those at the Regent-street Polytechnic."

CLEANING GLASS.—YOUNG AMATEUR asks: "Which is the best way of cleaning glass plates previous to squeegeeing prints on to them for 'opalines?' I am told that the perfect adhesion of the prints depends, in a great measure, upon the glass being absolutely clean. I have several formulæ for cleaning pastes and solutions, but I want to know which is best, the purely chemical cleaning with nitric acid and soda, or similar substances, or such mixtures as tripoli, china clay, or whiting, with ammonia and alcohol. Each has its bad points, but does either plan offer any material advantage over the other?"

CARBON PRINTING QUERY.—J. E. BEHREND says: "I recently came across an old formula for photo-lithography, in which iodide of silver is combined with the bichromatised gelatine, but for what purpose is not very evident, as no developing process is carried out that would affect the iodide. It struck me, however, that it might be possible, by using a tissue containing silver bromide as well as pigment, to combine the sensitiveness of the Warnerke process with the colour of ordinary carbon tissue. Is this possible?"—In reply, we believe that, when Mr. Warnerke first introduced his process, he made some experiments in this direction, but whether they turned out practically successful we do not know.

PYRO AND AMIDOL.—YORKSHIREMAN writes: "I am an ardent admirer of 'good old pyro,' and, although I use a formula of this developer, which suits my requirements exactly, I object to stained hands. My skin is very rough, and the stains, even of freshly made developer, are difficult of removal, even with solution of chloride of lime. I may mention that I always use my pyro dry, and other chemicals in ten per cent. solutions. I have tried amidol several times, but cannot get the results I wish. Could any reader give me the equivalents in grains of amidol to pyro; sulphite of soda to carbonate of soda; and the action of bromide of potash in solution with amidol, as I understood its action was not the same as in solutions of pyro. Having tried all the developers, one naturally, after ten years' experience, returns to pyro, knowing there is nothing to beat it; but business compels one to have clean hands."

STAINED GELATINE NEGATIVES.—PHŒNIX writes: "I have three unvarnished gelatine negatives that have got wet in the printing frames while in contact with gelatino-chloride paper, how can I prevent their ultimate staining? I have had this accident on previous occasions, and have taken precautions, as soon as the mishap was discovered, to prevent the stains, but, I am sorry to say, not successfully. My method consists in, first of all, thoroughly soaking the negative in clean water, then in solution of salt, and after that in clean fresh hypo, followed by copious washing. One would think that this treatment, applied before any stain has appeared, would prevent it; but not so, the invisible silver compound formed with the gelatine remains, and, on exposure to light in the printing frame, comes out as an appreciable discolouration, though not so bad as would be the case without the preventive measures. Can you suggest any further treatment before exposure to light?"

Our Editorial Table.

CATALOGUE RECEIVED.

A. E. Hoyles & Co., 70A, Shakespeare-street, Nottingham.

MESSRS. HOYLES' catalogue is styled a "guide to studio furnishing," which suggests its principal feature, viz., that it is devoted to illustrated particulars of painted backgrounds, studio accessories, rustic furniture, and sundries. It thus appeals to our professional readers, who should find it useful for reference when they are desirous of making additions to their studio furniture.

"PHOTOGRAMS" OF 1896.

London: Dawbarn & Ward, 6, Farringdon-avenue, E.C.

THE difficulties in producing a work of this character before the widespread interest excited by the Exhibitions of the Photographic Salon and the Royal Photographic Society has abated enhance the credit that is due to the editors and staff of our contemporary for the rapidity with which they have completed their task. The volume opens with a brief record of technical progress in 1896, and includes reproductions, not only of many of the principal photographs now hanging in Pall Mall and Piccadilly, but also of several non-exhibited works, including contributions from Canada, Australia, and America. Pictorially speaking, the reproductions are almost fully representative of the best English work, and, it goes without saying, that the get-up of the volume and the quality and printing of the blocks are exceedingly good.

Mr. Gleeson White's critical remarks are eminently appreciative and discriminative, although here and there we encounter unavoidable commonplaces of the phraseology of criticism, which we specially commend to the notice of Mr. George Davison, the Rev. F. C. Lambert, and others of their kind who are so fond of carping at the shortcomings of those whose constant duty it is to write about exhibitions in the photographic papers. Mr. Snowden Ward makes an apology for the "criticism against time" that he prints, but we are sorry that he did not enter a protest against the toleration of press-view pests and bores, whose mission it appears to be to make it as difficult as possible for editors of photographic papers to get through their by no means enviable labours on these occasions.

We cordially endorse a manly and outspoken protest against the photography of the merely naked that is uttered in the volume. Our American photographic friends are especial sinners in this respect, and we hope that they will seize the advice here given, to go through a thorough course of study with competent advisers when undertaking such work, and to exhibit a considerable diffidence in showing their results. We can all the more appropriately subscribe to this wise counsel from the fact that before us, as we write, are two American photographic publications having nude studies that are simply crude and vulgar records of physical facts.

We see mention of a Bristol Exhibition this year, and the statement that a good deal of the work shown there is to be found in the pages of *Photograms* of 1896. The Exhibition does not open for nearly two months yet. A trifling slip like this, however, may well be pardoned in face of the great skill and care that are expended on the volume as a whole.

"Primus" Novelties.

W. Butcher & Son, Blackheath.

"Primus" Diagram Lantern Plates.—These are glass plates, coated with a dark pigment on one side, upon which, by the aid of a fine point, diagrams, drawings, or writings may be scratched. When placed in the lantern, the projected image gives the inscription or drawing as white lines on a black ground. Many uses will suggest themselves for these prepared glasses.

"Primus" Lantern-slide Masks.—This, the "Drinkwater Butt" series, gives a selection of no less than sixteen different shapes, in rectangular, oval, circular, and cushion form. The masks are spotted with white spaces for writing upon. Lanternists should appreciate the series.

"Primus" Notice Lantern Plates.—These plates are coated on one side with a transparent preparation which takes writing ink, so that inscriptions may be rapidly written thereon for projecting on to the lantern screen.

"Primus" Photogravette. — This is a simple arrangement permitting of contact negatives being made from pictures in books, &c.

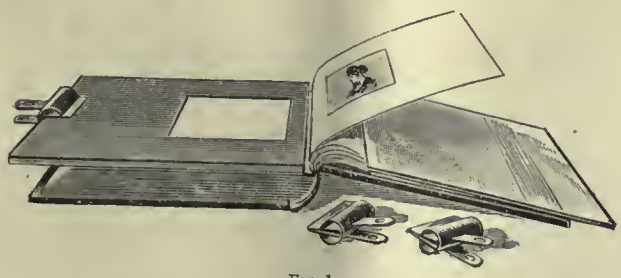


Fig. 1.

Fig. 1 represents the baseboard and carrier, with the plate placed in position in the book, film side upwards.

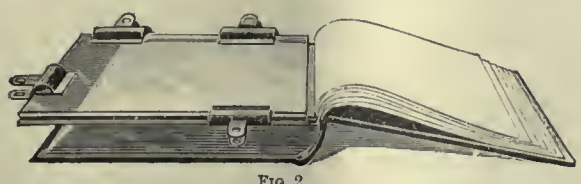


Fig. 2.

Fig. 2 represents the picture to be copied folded over on to the plate with the back of same uppermost; a glass plate is also placed over this, and the whole clamped together by means of the four clips.

The apparatus consists of a stiff baseboard, a carrier for the sensitive plate; a thick cover glass, and four strong clips. Contact between the sensitive plate and the print to be copied having been made (of course in the dark room) exposure is made to artificial light, and development is pursued in the usual way.

This method of copying by contact will, no doubt, be found useful by many in emergency.

Cloud Negatives.

The Brighton Photographic Company, Clarence-square, Brighton.

Some capital specimens of cloud negatives, made by the Brighton Photographic Company, are before us. They are printed by means of the carbon process, and are mounted on transparent celluloid. The era of white skies in photographs has quite passed, and if the photographer is unable to get clouds in his negatives, and has not the opportunity of making his own cloud negatives, all further excuse is taken from him by reason of the ready accessibility of such pleasing and satisfactory specimens as those submitted to us by the Brighton Photographic Company.

News and Notes.

Messrs. Henry & Co., of St. Martin's-lane, announce for publication two illustrated annuals, *The Pageant* and *The Parade*, both under the editorship of Mr. Gleeson White.

Royal Photographic Society.—Technical Meeting, Tuesday, October 27, at the Gallery, 5a, Pall Mall East, at 8 p.m. Demonstration of acetylene apparatus for portraiture and the optical lantern, by Mr. C. Hoddle.

The Austin-Edwards Monthly Film Negative Competition. — The prize camera for current month has been awarded to Mr. J. A. C. Branfill, 25, Rosendale-road, West Dulwich, for his negative, *St. Paul's from Newton's Wharf*.

The Hackney Photographic Society's Exhibition will be held in the Morley Hall, Hackney, on November 17, 18, 19, and 20. Entry forms are now ready, and may be had on application. The Society is prepared to collect pictures entered for the Exhibition from the Pall Mall and Salon at a charge of 3*d*. per picture, minimum 6*d*. Communications should be addressed to the Secretary, Mr. W. F. Fenton-Jones, 12, King Edward-road, Hackney, N.E.

Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock precisely, on Wednesday evening, the 28th inst. Travellers' Night. Mr. T. Charters White will give a lecture entitled *Switzerland*, which will be illustrated with lantern slides. Members are requested to note that the meetings of the Club will be commenced punctually each week at eight o'clock during the ensuing winter session.

The Walworth Junior Postal Camera Club.—The Hon. Secretary and Treasurer (Mr. P. C. Cornford), of 11, Grosvenor-street, Camberwell, London, S.E., writes: "Will you allow me space in the columns of your valuable paper to state that there are three vacancies in the above Club, caused by recent resignations, through pressure of other matters, and that I shall be pleased to send all particulars as to membership to any amateur who would care to join us, on receipt of one penny stamp."

Radiography in an Attempted Murder Case.—Henry Goodwin was again brought up last week at the Salford Police-court, and charged before Mr. R. Hankinson and Mr. Alderman Jenkins with burglary and attempting to murder Mr. Israel Rosenblum, merchant, Northumberland-street, Higher Broughton. Prisoner was remanded for another week on the application of Chief Detective Inspector Lyogue, who said there was now a likelihood of Mr. Rosenblum's recovery, but he would not be in a fit state to attend court for two or three weeks. In the course of an interview, Dr. Walmsley, the medical attendant of Mr. Rosenblum, stated that his patient had been radiographed by Mr. Chadwick, of St. Mary's-street, and, as the result of the process, the bullet was discovered in the chest. An operation with a view to its extraction will be made in the course of a few days.

M. Paul Desjardins has been instrumental in starting a society in Paris, known as the Union pour l'Action Morale, the object of which is to check the demoralising influence—growing every day—of certain posters, illustrated journals, and theatrical photographs displayed on the street walls and in the shop windows and kiosks. The subject is one which, of course, offers an easy excuse for ridicule in a sceptical city like Paris; but one can afford to ignore all cheap sarcasm, for the matter is a serious one and deserves to be considered as such. All cant and prudery apart, one may well be shocked at the shameless display of more or less naked figures which modern advertising thrusts in the faces of all and sundry. I am aware of the strong-minded argument, that corruption exists, and will exist, whether such pictures be displayed or not, and that they do nothing to increase it; that men's lower instincts are very much the same as they were in the earliest times, as gross and as animal; that progress is a snare and a delusion, and so on. Be it so, for the sake of argument; but the admission by no means implies that we are therefore to tolerate these scandalous exhibitions, which stand out in all their effrontery from the walls, and by their gaudy colouring must needs attract the attention of all who pass them by, not only men, but women and girls, and young children. It must be admitted that it is no easy task to bring about an improvement in these matters, but every one with a healthy mind, every self-respecting man who values the dignity of humanity, will wish all success to M. Paul Desjardins and his efforts.—*The Studio.*

THORIUM.—The rare metal thorium, discovered early in the present century by Berzelius, has lately sprung into importance in a curious manner. When burned, the metal emits a light more brilliant than that of magnesium, but, until the invention of incandescent gas burners, in which the flame is incased in a metallic mantle, no use was discovered for it. Upon experimenting upon various substances, it was found that the oxide of thorium, called thoria, makes the best mantle for such burners, and, a demand being thus created for it, the value of thoria sprang from about 2*d.* to 5*l.* a pound. At the present time a search is being made for new sources from which thoria can be obtained, and this search is being conducted in many countries. Originally the new metal was found only in certain rare minerals in Norway. Recently it has been discovered that the mineral monazite contains a liberal quantity of thoria, and monazite is found in North Carolina, Canada, and Brazil.

Patent News.

THE following applications for Patents were made between October 7 and 14, 1896:—

MAGIC LANTERN.—No. 22,456. "Improvements in the Optical or Magic Lantern." H. STOCKWELL.

FOCUSSING.—No. 22,538. "Improvements in the Method of and in Means for Focussing Photographic Cameras." A. BAMVENS.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
26	Bradford	*Platinatype for Beginners.* Walter Booth.
26	Camera Club	*What the Artist has to say about Colour.* G. A. Storey, A.R.A.
26	North Middlesex	*Artigue System of Carbon Printing without Transfer.* J. A. Sinclair, F.R.P.S.
26	Richmond	*Systematic Development.* Alfred Watkins.
26-31	Southport	Annual Exhibition.
26	Stafford Y.M.C.A.	*Enlarging.* H. Cliff.
27	Birmingham Photo. Society	*Practical Pictorial Photography.* A. Horsley Hinton.
27	Hackney	*Hints on the After-treatment of Negatives.* T. Belas.
27	Royal Photographic Society	Demonstration of Acetylene Apparatus for Portraiture and the Optical Lantern. C. Heddle.
27	West Surrey	Lantern-slide Making and Lantern Night.
28	Borough Polytechnic	*Present-day Printing Methods.* F. W. Levett.
28	Camera Club	Testing Lantern Slides.
28	Croydon Camera Club	Lantern Night.
28	Leeds Camera Club	Annual Dinner.
28	Leytonstone	Members' Lantern Evening.
28	Photographic Club	*Switzerland.* T. Charters White.
28	Southport	Annual *Soirée.*
29	Ashton-under-Lyne	Exhibition of Members' Lantern Slides on Stands.
29	Camera Club	Dr. Norman Cellie.
29	Liverpool Amateur	*Animated Photographs.* Birt Acres.
29	London and Provincial	*Flexible Films.* T. E. Bullen.
30	Croydon Microscopical	Conversational Meeting.

ROYAL PHOTOGRAPHIC SOCIETY.

OCTOBER 20,—Photo-mechanical Meeting,—Mr. Horace Wilmer in the chair.

HALF-TONE DIRECT FROM NATURE.

Mr. WILLIAM GAMBLE read a paper upon this subject. In his early experience with the half-tone process, he said he had been told that it was impossible to make a half-tone negative direct from a landscape, a sitter, or even from still-life objects, and this because the screen could only deal with a plain surface; and, further, because, even if this difficulty could be overcome, the exposure would be prolonged to such an extent that the range of subjects which could be dealt with would be very limited. The first objection he characterised as absurd, while the second could only hold good in the days when screens were less clear than at present, when wet-collodion plates were believed to be indispensable, and when the method of adjusting the screen and diaphragm to produce varied effects was not known. Amongst other things which the use of dry plates had made practicable was the problem of direct half-tone from nature. By their means exposure was reduced and apparatus made more compact, and the screen could be set much closer, or even in contact with the plates, rendering it possible to use shorter-focus lenses and smaller cameras. It was quite possible to take direct half-tone negatives by the existing methods for copying from prints, but the length of exposure made this course impracticable except for still-life subjects, and the question to be solved was how to reduce the exposure. With this object, the size of the diaphragm might be increased if the distance of the screen could be sufficiently reduced to compensate for it; but this would mean that the aperture would be increased at the expense of the shadows of the picture, and a preliminary exposure with a small stop appeared to be essential to avoid this disadvantage. The use of screens with thinner lines would be a reversion to an obsolete practice, and such screens rendered the shadows imperfectly. A third way of reducing exposure would be to use more rapid plates, and the lecturer doubted the necessity of a slow-process plate. He had made half-tone negatives on ordinary plates, and produced very good prints from them, it was simply a matter of adapting the printing to suit the negative. With the assistance of Mr. Branfill, he had prepared a series of tables, showing maximum screen distance for a stop of a certain size. He had designed a dark slide containing mechanism for adjusting the screen as close as one sixty-fourth of an inch, and it was consequently possible to use a large stop, and therefore to materially reduce the exposure, and also to employ lenses of shorter focus. The rule that short-focus lenses were unsuitable for half-tone needed qualification. It was rather a matter of angle than focal length, a narrow angle being requisite in order to project sharp dots on the plate at the usual screen distances. With a camera fitted with a cross-line screen it was quite easy to make a direct half-tone negative, just as though the object in front of the camera was a paper print, the only difference being that the negative would be more vigorous than one made from a print. One of the chief troubles to be overcome arose from the fact that the high lights would be over-exposed before the dots in the shadows had had time to form. This could be met by making either a preliminary or final exposure on a sheet of white cardboard with a small stop in the lens, producing a grain of dots all over the plate not larger than they should ultimately be in the shadows. This dodge, however, although very effective in the process studio, could hardly be applied out of doors or in a portrait studio. The same object could be attained by preparing plates beforehand, but then they would have to be used at once without removal from the slide, for, if removed, they could not be replaced so that the dots came again just under the openings of the screen. Another method of graining the plates was to place a very small stop in the lens, in front of the lens a small condenser, and behind the condenser, and at a suitable distance, a strong source of light, very fine black dots being produced on development after final exposure upon the subject. The idea of a vignetted screen seemed in theory the most perfect for the process, but in practice the dots would probably be "woolly" or unsharp, and it was questionable whether the shadow dots would stand reduction so as to produce sharpness. Apart from the idea of making a grained negative direct, it had been suggested that it would be more practicable to take the negative in the ordinary way, and make a grained transparency from it, or to make an ordinary positive and from that a grained negative, and the paper concluded by enumerating some methods upon these lines.

Mr. Gamble showed the camera and dark slide with which his experiments had been made, together with a set of diaphragms of various shapes and lantern slides illustrating the character of the dots obtained.

The Rev. F. C. LAMBERT remarked that the paper was one which would amply repay consideration, but which it was scarcely possible to discuss on the present occasion, and, this being the general opinion, no discussion took place.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 15,—Mr. H. Snowden Ward in the chair.

Mr. A. E. Allen was elected a member of the Association.

The HON. SECRETARY reminded the members of the print competition, arranged for November 5. Photographs are to be taken solely within the London postal district, and he hoped to see a lot of entries on that date.

SPOTS, PINHOLES, &c.

Mr. Mackie showed an albumen paper print, covered with spots, which had been fixed in two hypo baths so as to ensure proper fixation, the cause of which he could not explain.

It was thought to be due to splashes of something or other, but nothing definite was suggested.

Mr. HODD inquired the reason why negatives, after intensification, frequently show pinholes not before visible. He had met with many examples lately. They had been blackened with ammonia.

Mr. WALL had never met with it with any blackening agent but ammonia. The only reason he could suggest was that the silver was dissolved by the ammonia. A cure for it was not to use ammonia, but that did not explain it.

Mr. EVERITT said air bubbles might have been formed during the bleaching of the plate with the mercury, and so form a contrast between those places and the intensified parts surrounding them.

Mr. HODD could not accept this as the reason, because, where the pinholes were, there was absolutely clear glass.

Mr. MACKIE said it was a common experience, and he thought it due more to the gelatine than anything else.

Mr. BANKS stated that it was a very common thing with the wet-collodion process, but the explanation which applied to collodion negatives would not do so with gelatine plates. The explanation as to collodion was that there was a piling up of the image on the surface of the collodion, which was unable to carry it, and so gave way.

Mr. MACKIE said he had ventured a statement at a previous meeting that a negative with a long exposure generally required long development. He referred to some negatives taken in the British Museum, which took from ten to twelve minutes to develop, as against three minutes with studio work with relatively the same exposure. It had been said that they must have been under-exposed, but he did not think so, and showed a specimen to support his statement.

Mr. EVERITT denied saying they must be under-exposed, but considered that, under the conditions given by Mr. Mackie, the studio negative received relatively more exposure than the Museum negative.

Mr. WALL could only infer that that meant that the Museum negatives were under-exposed. He had seen some of them, and did not hold that opinion, however.

Mr. EVERITT replied that the studio negative might be over-exposed.

The CHAIRMAN read the following from the question-box: "What is the action of caustic potash in the silver bath?"

This was supplemented by Mr. RAPSON saying that light action was required, after the addition of the caustic potash, to finish the precipitation of the deposit that is formed.

Mr. MACKIE replied that it first neutralises the acid, and then reacts with the silver, forming oxide of silver. Light or heat was required to reduce the organic matter.

A lecture was given by Mr. EDWIN BANKS on

THE THEORY OF DEVELOPMENT [see page 677].

Mr. HADDON expressed the interest with which he had heard the lecture. With reference to his own paper, which had been mentioned, he still maintained that the insolubility of the gelatine was due to the combination of the oxidised pyro with the gelatine. In his experiment he had bubbled air for some hours through a solution of pyro and an alkaline carbonate, and at the end of that time Nelson's gelatine was soaked in the solution and then thoroughly washed. Previously it went into solution at 35° C.; but, after being heated with the oxidised pyro, it would not go into solution at the boiling point of water. Here was a case in which no bromine came into contact with the gelatine. The only means which would lower its melting point was the addition of hydrochloric acid. The colour was due to the oxidised pyro. He did not agree that it was the liberated bromine that rendered the gelatine insoluble. That there was something more than a mere alteration in the vibration of the molecules of bromide of silver under the action of light was proved by the fact that the medium which supported the bromide of silver had more influence on the speed of the plate. A good deal depended upon the power of the medium itself to take up bromine.

Mr. WALL thought it a pity that the lecture had not been written. He felt in doubt as to some of the points raised by Mr. Banks. The electrical theory carried a good deal of weight with it, and there was a strong argument in favour of the image being formed entirely by some sort of rearrangement of the molecules. He did not agree as to the composition of the stain in the silver image, and did not think it was deposited carbon from the pyro.

Mr. EVERITT said, so far as he could judge, it was worthy of very close consideration. Mr. Banks started his theory with a great deal of evidence in its favour, and it was one which he hoped would be carried beyond the theoretical stage, and endeavours made to substantiate it by experiment. He asked how the theory would fit in with the phenomenon of reversal of the image? If it could be done, it would be more than had been previously done. With reference to the difference between Mr. Banks and Mr. Haddon on the question of the tanning action of pyro, he thought it possible that both might be right. It may be that the tanning action produced in development may be due to the bromine, while, under Mr. Haddon's conditions, his contention may be correct that the oxidised pyro was the tanning agent.

Mr. BANKS, in reply to Mr. Haddon's statement that gelatine became insoluble in the experiment mentioned, stated that Watts says that an alkaline carbonate oxidises pyro into di-gallic acid or tannin, but he still failed to see the proof that pyro was a tanning agent on the gelatine in the development of the plate. In answer to Mr. Wall, he inquired what was the pyro stain in the image if not carbon? The theory that it was carbon was borne out. For instance, take an exposed plate and soak it in a strong solution of pyro for five or six minutes until thoroughly saturated. The pyro penetrates the film, and is imprisoned with the silver bromide, and, if the plate is flooded with ammonia, it may be rocked as much as you please, but nothing will disturb the pyro. The result is that the image will be as hard and intense as possible, and the pyro is decomposed within the film. If the silver of such an image is removed by any means, there still remains a negative in pyro stain. He did not claim that it was absolutely pure carbon, but no means had been found to dissolve it. He did not see why his theory should not agree with reversal as asked by Mr. Everitt.

The CHAIRMAN had listened with great interest to Mr. Banks' new theory, and said that it appeared that Dr. Burton Cox's well-known experiments had, after all, a good deal of truth in them, and he hoped to see very shortly the perpetrator of the hoax step forward to claim the reward which had been offered for his discovery.

PHOTOGRAPHIC CLUB.

OCTOBER 14,—Mr. Naegali in the chair.

The HON. SECRETARY made a statement in reference to the punctual commencement of the meetings during the winter sessions. In the summer time he said we are apt perhaps to be a little slack and informal, but it is proposed, especially in view of the fact that some of the members leave at an early period of the evening, that in future the meetings shall begin sharp at eight.

Mr. HODDLE gave a demonstration of acetylene gas and of his Incanto gas generator. He stated that the gas was made by the addition of calcium carbide to water; the process, therefore, of gas manufacture is simplicity itself. His apparatus consists of two galvanised cylinders constructed to slide one within the other on the well-known principle of a gas-holder. Within the inner cylinder is a device for holding the calcium carbide in such a way that, when the outside container is partially filled with water, the weight of the inside cylinder presses down the receptacle which contains the carbide into the body of water contained in the outside case. In this way the action of the gas-holder (which is at the same time the gas-generator) becomes automatic through the rising and falling of the inner cylinder. The apparatus has a suitable device for cooling and condensing the moisture in the newly prepared gas. One pound of carbide gives off five feet of acetylene gas, and this quantity will burn for two hours with two burners suitable for the gas. The carbide costs, including packing, about 6*d.* per pound. The demonstrator stated that he had been experimenting and using the gas in his generators for years, and had suffered no ill effects from the smell of the gas. In reply to questions, he said that the gas itself, as well as the calcium carbide, had a strong, and some people thought a disagreeable, smell. Its luminosity was about fifteen times that of coal gas. He had not experienced any explosion. The demonstration was illustrated by the use of the Incanto apparatus. The use of the gas was also demonstrated in the lantern, and slides were projected by its means upon the screen.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE following is the annual report of the Society for the session 1895–96:—

In submitting the Society's forty-first annual report, your Council have much pleasure in stating that, on reviewing the past twelve months' work, it is gratifying to feel that the interest in every way has been thoroughly maintained amongst the members.

If you remember, at the last annual meeting your attention was directed towards the providing of subjects at the general meetings by members outside the Council who, although taking an interest, were lax in coming forward. Without dwelling further on this matter, your Council further urges you to bring forward any suggestions or papers which would be of interest to the welfare of the Society.

There have been nine general meetings held in the Society's rooms and three outdoor meetings. In November, 1895, Mr. H. Wade gave an interesting demonstration on the process of carbon printing, exhibiting examples of the various modes of varying results. The December meeting was devoted to a paper given by Mr. S. L. Coulthurst on *Hand-camera Work*, reviewing the position of the camera, and also by describing the lens, shutter, changing plates, developer, &c. In January, 1896, the subjects of the meeting were varied: Mr. H. Smith on *Colouring Gelatine Photographs;* Mr. F. Edwards on *Modes of Intensifying Dry Plates*, with a demonstration; Mr. A. S. Casson on *Collodio-chloride Paper*, also with a demonstration. The March meeting was occupied by Mr. A. Brothers on photographing the corona without an eclipse. In April the Society were fortunate in having the services of Mr. N. Luboshez, of the Eastman's Photographic Materials Company, who delivered a most interesting lecture on *Successful Portraiture, and Platinum-bromide Printing.* For the May meeting, Mr. Harry Wade gave a paper and demonstration on the *Home Preparation and Manipulation of the Plain Salted Silver Paper.* The last meeting was of a technical character, when Mr. H. M. Whitefield opened a discussion on *Washing and Finishing Prints.*

Your Society held a most successful Exhibition in the month of February, which, in number and quality of exhibits, almost surpassed those of previous years. The Exhibition was opened for two evenings, the first of which was partly occupied by a display of the competing lantern slides, also by a descriptive lecture by Mr. H. Wade, entitled *Glimpses and Glances*, and the following evening by Mr. S. L. Coulthurst, exhibiting a series of slides illustrating *Street Life in Manchester.* In the competitive classes the awards were close, and the thanks of the Society are due to Messrs. W. Artingstall, J. W. Wade, and George Wheeler, who acted as Judges.

Owing to the rooms of 36, George-street, not being available for indoor meetings during the summer months of June, July, and August, it was decided the meetings should partake of a social character, and be held at some suitable place convenient to Manchester on the Saturday following the date of the monthly meeting. The first arranged was:—Delamere and Mouldsworth, on June 13; Chelford for Astle Park, on July 11; Bramhall for Bramhall Hall, August 8. The interest, as shown by the attendances at each meeting, was highly gratifying, and the new feature in having these summer meetings proved an exceptional success.

Referring to the lantern section of your Society, the members have not come forward with their usual enthusiasm, and the meetings were not well attended; doubtless, due, in a great measure, to the room being uncomfortable during the winter months; but, in the new premises, a much larger gathering is expected.

At the first meeting of this section, Mr. J. Hyde gave a lecture on *Switzerland and its Glaciers*, employing slides by M. Fevrier, of Paris. January meeting, Mr. A. S. Casson contributed a paper on *Stereoscopy on the Screens.*

The thanks of the Society are due to Mr. J. W. Wade, of the Manchester Amateur Society, who, for the February meeting, gave his method of producing various colours in lantern slides, accompanied by a set of slides showing results obtained. At the same meeting Mr. Hill Whitefield demonstrated his method of printing clouds in lantern slides. The March meeting was devoted to members' slides.

The thanks of the Society are also due to Mr. Harry Wade for reporting the various meetings, also to the publishers of photographic periodicals for gratis copies sent during the year, including the firms who have contributed exhibits of apparatus and specimens, which have increased the interest of meetings.

The roll of the Society contains the names of ninety-five members, of which ten have resigned. During the year twelve new members have been elected, thus showing an increase of two.

In conclusion, the Council, in retiring from office, beg to draw your attention of having been able to secure more commodious and comfortable rooms at 44, Moseley-street, known as the Chamber of Commerce Rooms, than those which have been hitherto occupied by the Society. Trusting that such a change will be beneficial, and also that the welfare of the Society will be fully sustained in the future, with confidence leaves the election of its successor to the members who are gathered here this evening.

The following were elected the Council for 1897:—*President:* Mr. S. Chilton.—*Vice-Presidents:* Messrs. A. E. Casson, F. Edwards, W. Tomlinson, H. M. Whitefield, and J. Wood.—*Council:* Messrs. T. M. Brooke, J. Hyde, J. Peddie, J. C. Wolfenden, C. H. Coote, H. V. Lawes, A. Heywood, F. W. Masters, H. Wade, J. Whittaker, and H. Woolley.—*Lantern Committee:* Messrs. W. Tomlinson, J. C. Wolfenden, H. Wade, and J. Whittaker.—*Hon. Curator:* Mr. J. Whittaker.—*Hon. Librarian:* Mr. C. H. Coote.—*Hon. Reporter:* Mr. Harry Wade.—*Hon. Treasurer:* Mr. G. W. Coote.—*Hon. Secretary (pro tem.):* Mr. A. E. Casson.

Hackney Photographic Society.—October 13, Mr. R Beckett presiding.—In a discussion on halation, Mr. GOSLING said that he had found a difficulty in getting complete optical contact with gummed backing papers. Mr. FARMER had found a certain tissue to be effective. Dr. ROLAND SMITH had used with success commercial burnt sugar mixed with methylated spirit. A paper by the Rev. F. C. Lambert was read, in the absence of the author, by Mr. E. PUTTOCK. It was on

THE TREATMENT OF THE FIGURE,

and contained much useful advice as to posing, lighting, composition, &c. A series of slides were shown on the screen to illustrate the subject. In a discussion as to the advisability or otherwise of ruling a focussing screen with

lines to assist composition, Mr. RAWLINGS deprecated the practice, as being liable to lead to a cramped style and too much uniformity. The CHAIRMAN said that the system of composition could never be carried out on fixed lines. Each must depend on its own requirements. The composition of a picture often depended on masses and tones as well as lines.

North Middlesex Photographic Society.—October 12, Mr. Mummery (the President) presiding.—The ordinary business of the evening was suspended, as this was a meeting to which ladies were invited, being a lantern lecture, by Mr. FENTON-JONES, of the Hackney Photographic Society, entitled

VENICE AND LUCERNE.

The lecture proved very interesting, and was enlivened by humorous quotations from Mark Twain descriptive of some of the scenery. The audience showed their approval by the hearty manner in which they responded to the vote of thanks, proposed by Mr. PITHER and seconded by Mr. LISETT. Mr. Fenton-Jones, in replying, said that he hoped that the tie which already existed between the Hackney and North Middlesex Societies would continue and gain in strength.

Richmond Camera Club.—The winter session was opened on the 5th inst. by a

LANTERN SHOW OF PHOTO-MICROGRAPHS

by Mr. J. CHARTERS WHITE. Over a hundred most interesting slides were projected on the screen, and explained by Mr. Charters White in his characteristic humorous manner.

On Monday, the 12th inst., the PRESIDENT (Mr. J. P. Cembrano, jun.) read a paper on

EXHIBITIONS AND HINTS TO EXHIBITORS.

After contrasting the present system of Exhibitions with that of a few years ago in respect to classes and awards, Mr. Cembrano proceeded to touch on "the two greatest and best organized photographic Exhibitions of the present day," namely, the Pall Mall Exhibition and the Salon. He advocated raising the standard of exhibits still higher, and of doing away with awards entirely. Moreover, he suggested that the Royal Photographic Society should hold two Exhibitions yearly, one dedicated entirely to the pictorial side of photography, and the other to the scientific and industrial aspect. Mr. Cembrano gave high praise to the "Salon" promoters, in that they have made it possible to hold in this country a series of successful annual Exhibitions without charging for wall space or awarding medals. He concluded a most interesting paper with some excellent hints to exhibitors, one of which is a sort of "negative," namely, If an exhibitor wants to ensure not being hung, and not getting an award, he will frame his exhibit in a gaudy plush and gold frame, with all sorts of enrichments.

South London Photographic Society.—At the last meeting of the Society, held at Hanover Hall, Hanover Park, Peckham, the President (Mr. F. W. Edwards, F.R.P.S.) in the chair, Mr. ROBERT ROBERTS (Prosser Roberts Drug Company) gave before a crowded meeting a demonstration of *Photography with the Röntgen Rays*. The demonstration gave clear and concise directions of what to do and what to avoid in order to attain success. A negative of a hand, showing a malformation, was taken and developed. The pose of the fluorescent screen was shown. Samples of Mr. Norman Vine's retouching powders were distributed.

Woodford Photographic Society.—October 15, Annual Meeting.—After the usual routine business had been gone through, the SECRETARY submitted his report upon the state of the Society, its work and finances for the past year. He said the membership had increased, but the attendance could hardly be considered satisfactory. Demonstrations upon *Platinotype*, by Mr. W. H. Bennett, and *Lantern-slide Making*, by Mr. Marriage; *A Holiday in Derbyshire*, illustrated by a set of nearly fifty lantern slides, by Mr. Ember; and the Leeds slides, circulating among the affiliated societies, formed part of the year's work. The excellence of the work shown at the Exhibition last November was touched upon, and congratulations offered to those members whose pictures were shown at Pall Mall. The balance-sheet showed that last year's deficit had been wiped off, a balance in hand of 1*l.* 15*s.* remaining. An appeal was made to the members to endeavour to increase the membership, and, if possible, to draw within the Society the many photographers in and about Woodford who do not belong to any other society, a course which would benefit them and generally conduce to an improvement in photographic work done in the neighbourhood. Mr. WILMER, at the conclusion of the report, in proposing a vote of thanks to the retiring officers, warmly praised the Secretary for his interest and exertions on the Society's behalf during the past year. The officers elected for the present year are:—*President:* Mr. E. Marriage.—*Council:* Messrs. Caird, Goodwin, and Malby.—*Lanternist:* Mr. E. Noble.—*Hon Secretary and Treasurer:* Mr. F. E. Ember. The programme for the present year is a capital one.

Ashton-under-Lyne Photographic Society.—This Society had a very successful opening night for the winter on Tuesday evening, October 13. The lecturer was Mr. W. Lamond Howie, and his lantern views were simply superb. We are inclined to think they are the best that have ever been exhibited in Ashton; but lantern views generally have attained to such perfection that one is almost inclined to say the same thing after every fresh lecture. Of course, everything depends upon the photographer's eye for the picturesque, and this Mr. Lamond Howie possesses in a high degree. Bleak stretches of snow and rock are, one would think, very difficult to make interesting, and yet Mr. Howie sets himself to this almost impossible task and succeeds to admiration. He always puts into his slides a sufficient number of striking features to make every fresh one arrest the attention and impress upon the mind that one is viewing some of the most marvellous features on the varied surface of the globe. It makes a wonderful difference when one views objects at an angle of something like eighty degrees. If Stamford-street, for instance, could be upended from Cockbrook to St. Peter's at such a degree, with all its houses sticking out on either side, the appearance would be most astonishing. Standing at the Park gates, St. Peter's Church would be brought apparently quite close to the eye, but it would still be at the same absolute distance. One's ideas are for a while quite upset. Distances cannot be gauged by a stranger to mountains with any approach to accuracy, and great mistakes are made in guessing what they really are. The same difficulty must necessarily be experienced in estimating the height of mountains shown on the screen. The lecturer has frequently to impress upon his audience that things are not just what they seem, but a considerable deal different. It is not altogether the atmosphere, although that, of course, is clear; but the changed angle of vision accounts for much more. For those who did not appreciate the mountains so much as they ought to have done, Mr. Howie had some views of the Milan Cathedral and of the old Roman architecture of Aosta, which could not fail to prove very striking.

Darwen Photographic Association.—October 15.—M. J. Lees, of the Manchester Amateur Photographic Society, delivered a lecture entitled *A Tour in Spain*, illustrated by lantern slides from photographs taken by the lecturer himself whilst on a holiday there. The Rev. Henry Irving (President of the Association) occupied the chair, and there was a large attendance of members. The lecture was keenly enjoyed by all present, as it was both interesting and instructive. In the concluding portion of the lecture Mr. Lees gave a vivid description of a Spanish bull-fight as witnessed by himself during his tour. The lecturer was accorded a hearty vote of thanks.

Wolverhampton Photographic Society.—This Society commenced its session for 1896–7 on Friday, October 16, at the Blind Institute, Victoria-street, where the society's room are situated. Mr. H. E. Perry (President) occupied the chair.—Mr. E. C. Middleton, of the Birmingham Photographic Society, gave an interesting demonstration of

THE CARBON PROCESS.

After a brief review of the chief points in the history of the process, the lecturer called attention to its three great advantages, viz., permanence, wide range of colour, and simplicity. The permanence of carbon prints arises from the fact that the finished picture consists simply of any suitable artist's pigment locked up in gelatine which has been converted into a kind of parchment; and, as the makers of the materials are careful to use only stable pigments and paper of the highest quality, the permanence of the result is as perfect as in the case of ordinary engravings. As any permanent artist's pigment may be chosen, there is a wide range of colour for the prints. The simplicity of the process, particularly in the case of single transfer, is due to the fact that the gelatine tissue, which consists of ordinary gelatine mixed with pigment, supported upon a backing of paper, is supplied by the makers in a variety of colours ready-sensitised, and it is only necessary to expose a piece of the tissue to the light behind a negative, measuring the time by a simple actinometer. The exposed tissue is then soaked in cold water, and pressed down on to paper, glass, or any desired material which can be made waterproof. A short immersion in warm water, which now follows, dissolves away the bulk of the pigment, leaving the picture on its paper or other support. The only other steps necessary are a slight washing and drying. The prints by this single-transfer process are reversed as regards rights and lefts unless a reversed negative is used. By the double-transfer process, which involves another simple operation, this can be obviated. The lecturer practically demonstrated the single-transfer process, developing the pictures upon various kinds of drawing-paper, opal glass, and also upon plain glass for transparencies. The operations of the double-transfer variation were next shown. The whole of the demonstrations were performed with Mr. Middleton's accustomed dexterity and neatness, and gave much pleasure to those who were fortunate enough to witness them. Those who had not previously seen the carbon picture developing out clearly and beautifully from the seemingly hopeless mess of pigment were quite fascinated, and, no doubt, many members will forsake silver printing, with its doubtful permanency, now that they have seen the ease and beauty of the carbon process.

Photographic Society of Ireland.—The winter session, 1896–97, of the Photographic Society of Ireland was opened at their rooms, 35, Dawson-street, on Friday, October 9, when the PRESIDENT of the Society (Mr. Alfred Werner), who occupied the chair, delivered an address on the history and development of the art. There was a good attendance. The President, who was well received, said he would deal with the question of photography principally from a scientific point of view; but, as he desired to keep himself in touch with all the members, he hoped, during the session, to also address himself to those whose studies were not so far advanced, and to those who looked at the question from a practical or technical point of view. The lecturer then referred to the discoveries of Daguerre in, 1839, in relation to the transference of images to plates. Daguerre had worked fifteen years before he had made these discoveries. The speaker next detailed the various experiments by which it was found possible to transfer images to plates, and the means by which photography, one of the foremost and most beautiful discoveries of the nineteenth century, had arrived at its present state of perfection. With photography time had worked many changes. Several new processes had been discovered since 1839 for the transference of images to plates, some to only sink into the sea of oblivion, and others to remain until ousted by more improved methods still. Continuing, the lecturer pointed out the methods by which the art is now worked, and concluded amid applause. The remainder of the programme consisted of magic-lantern views and musical selections, followed by refreshments. Miss Ruthven opened the musical part of the proceedings with a pianoforte solo, given with much acceptance. Miss Ferguson and Mr. W. J. Erskine gave a duet, "O that we two were Maying," very creditably. Miss Brien was successful with her song, "For the sake of the past," and was accompanied on the piano by Miss Ruthven, Miss Mabel Brien playing a violin obbligato with taste and finish. A number of comic songs were contributed by Mr Arthur James, and, needless to say, drew forth fluttering tokens of approval. The magic-lantern views from handsome slides by Messrs. Victor Smith (Secretary of the Society), J. H. Gane, A. C. Ruthven, A. W. Geddis, and J. Keogh, proved a pleasant item on the programme, and unmistakably showed the perfection to which the photographic art has been brought. Tea, &c., brought an enjoyable evening to a close. Professor Scott and Mr. Geddis managed the lantern.

1896. FORTHCOMING EXHIBITIONS

Oct. 23-Nov. 7	Photographic Salon, Dudley Gallery, Piccadilly. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 23-Nov. 12.....	Royal Photographic Society. R. Child Bayley, 12, Hanover-square.
,, 26-31	Southport Social Photographic Club.
November 12	Dulwich Photographic Society.
,, 17-20.....	Hackney Photographic Society. W. F. Fenton-Jones, 12, King Edward Road, Hackney.
December 3, 4.....	Aintree Photographic Society. E. P. Heron, 2 Tilney-street, Orrell Park, Aintree, Liverpool.
,, 28-31.....	Borough Polytechnic Photographic Society. P. C. Cornford, 103, Borough-road, S.E.
Dec. 1896-Jan. 1897	Bristol International. Hon. Secretary, 20, Berkeley-square, Clifton, Bristol.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PRINTING UNDER GREEN GLASS.

To the EDITORS.

GENTLEMEN,—Seeing in your issue of last week a letter about the colour of albumen prints made under green glass, I beg leave to enclose two prints from a negative of a monkey, the grey one printed under green glass, the brown one in the ordinary way. The grey print became grey during printing, and did not change colour at all during toning. The paper used for both prints was from the same sheet of Edwards's double albumenised paper, and toned in the same bath.—I am, yours, &c., S. A. A.

October 15, 1896.

[The grey print, compared with that having the brown tone, is flat and lacking in detail.—EDS.]

RE "NOTES ON RADIOGRAPHY."

To the EDITORS.

GENTLEMEN,—I read with much interest Mr. Hall-Edwards's experience with the X rays, and observe that he would like experimenters to communicate their own experience in this direction. Your readers may be interested in knowing what effect a shock from a ten-inch spark may produce when accidentally taken through the hands. Whilst engaged on Röntgen X rays at Earl's Court Exhibition a month or two back, I was unfortunate enough to get a severe shock through the hand whilst engaged in putting on a tube, an official standing at the coil attending the switch. The shock at the time showed no ill effects, but about a week afterwards my fingers on left hand, where I felt it most, began to swell and look very purple. My doctor told me to run cold water freely over the hand, but I found this only caused a further apparent inflammation.

Of my own accord, I began to poultice with hot linseed, and got relief. I should have said that, during this swelling and inflammation, a burning pain was constantly present, and, of course, stiffness of the hand and fingers. The poulticing soon gave ease, however, and on the back of the fingers there came large blisters, which filled with a watery fluid, so that each finger was double its normal size, or, rather, thickness. The blisters gradually gave out, and had a tendency to dry up. By degrees I peeled off the blister skin, and found a new, pink-coloured skin had formed underneath. All this time—some three weeks or so—I had to keep my hand tied, as it was not only unsightly, but tender, and somewhat painful. I don't know if any similar experiences have been met with, but this is the effect it had on myself.

Another curious thing that happened was that five or six tubes—which had all done a fair share of work—one day refused to give us any effects. I did not know of the method of reversing the current for some time through the tube, but put it down to air having worked in, as the tubes gave out a violet ray when the current was turned on; probably the effect may have been due to atmospheric change, or non-uniformity of the electric discharge. Mr. Hall-Edwards mentions barometrical influences, and, if he will take the suggestion, I fancy dampness directly a great source of trouble, as the sparks would often fly round the outside of the tube instead of passing through; but this, I suppose, he has noticed.

Plates would often be over-exposed in dry weather, and underdone on damp or rainy days. I will conclude by saying that there were many curious things I could mention, but am afraid space cannot be afforded, so must thank our Editors in anticipation, and hope that what I have said may not be altogether unprofitable.—I am, yours, &c.,

101A, *Fulham Palace-road, Hammersmith, W.* F. G. WILLATT.

AMATEURISM AND PROFESSIONALISM.

To the EDITORS.

GENTLEMEN,—I wrote "Dogberry," and he was good enough to say in your JOURNAL "it was a very reasonable letter." I wrote again, and this time he says he has got another "rather rambling letter" from me, and he has found that I do cabinets too cheap, but he does not notice that it is on account of the *false amateur* taking away my work. I think that even the quarter of a loaf is better than no bread, and, if any of my brother professionals are not pleased with my way, I have only to say, Perhaps my method of conducting business is as good as their own. But "Dogberry" complains of some other professional charging too high a price for his pictures. Who set "Dogberry" up as judge? Was it this thing he calls common sense? But, if you, Mr. Editor, would give me fair play, you would put my letter in full in the JOURNAL. I dare say "Dogberry" will give it to you.—I am, yours, &c.,

ARCHIBALD ROBERTSON.

88, *Glassford-street, Glasgow, October* 16, 1896.

[We shall be happy to print the letter referred to.—EDS.]

"THE POOR CHEMIST."

To the EDITORS.

GENTLEMEN,—"Dogberry" does me too much honour. I have no wish to pose in any degree as a champion of the Pharmaceutical Society; far from it. I wrote, firstly, to point out certain inaccuracies and absurdities; secondly, because I was sorry to see signs of ill feeling between two bodies so closely allied (looking at it broadly) as chemists and photographers. I have, in common with a good many other people, a great dislike to half truths and one-sided statements, also to persons like "Medico" foisting, as new and original, old jokes and legends which have been known in the trade for many years. I heard that "ill-Evans" story at least ten years ago; but life isn't long enough, or the days are too short, for this kind of work. I can only wish some of your readers and contributors could have a few weeks behind a busy drug (?) counter.

The Society was in the right over those Edinburgh cases; but, while prosecuting Mr. Hume, they pass over another firm of photo *chemists*, equally eminent, who have had no qualified assistant for years! What is sauce for one, &c.

I must confess I do not appreciate, as perhaps I might do, the principles which are supposed to actuate the Pharmaceutical Society. I believe their chief aim is to improve the status of the pharmacist. The results of the last examination read as follows:—Candidates examined, 164; *failed*, 114; passed, 50! This shows that the meshes of the pharmaceutical net are pretty fine. The list of "restricted" drugs and chemicals remains practically at the same point as in '68. The bulk of the "dispensing" is done by the doctors, some of whom are not above private clubs of their own, something after the style of the club portrait business you know. Life assurance schemes, burial funds, and an occasional bean feast, form, so I am told, part of the general scheme. All very high class and professional, as you will perceive! Then, again, practically all pharmacy—that is to say, the preparation of drugs, tinctures, extracts, and so on—is done ready to hand by the wholesale firms. So that in a great many instances a "penny in the slot" machine might very well take the place of the average *chemist!* the quasi-scientific, semi-professional, up-to-date product of the Pharmaceutical Society.

All this accounts, naturally, for the fact of so many chemists being chemists only in name.

I ask your sympathy once more on behalf of the poor chemist.—I am, yours, &c., J. PIKE, *Chemist and Dental Surgeon.*

Nottingham.

To the EDITORS.

GENTLEMEN,—What a pity it is that some of your correspondents will write such erroneous statements about the Poisons Act!

I notice that Mr. H. Bennett, in his letter to you, says: "It is not educational attainments at all, but membership of the Pharmaceutical Society, that qualifies the man to sell poisons" May I be allowed to inform him, firstly, that educational attainments are necessary, legally; and, secondly, that membership of the Pharmaceutical Society is quite unnecessary. Also, let me add that five-sixths of the whole body of chemists are *not* members of the Pharmaceutical Society, and that a large majority have not the slightest connexion whatever with the Pharmaceutical Society, beyond, of course, the fact, that the Society has at some time or other examined them, and keeps a register of their existence. I observe that "Nemo," in his last letter to you, still continues to wander along the devious paths of romance instead of keeping to the beaten track of fact; but, at all events, I am glad to notice that the exceedingly offensive tone which marked his former letter has not been employed. I am sorry that he has to complain of his being called a liar; but, if he stigmatises a whole body of men as rogues, what can he expect?

With regard to his statement in your last issue, why does he use the expressions, "Is that correct or not?" "I understand that," "apparently," "I should very much like to hear some one else's opinion?"

Why, on earth, does he not take the trouble to find out all about these little things before writing about them? Every sentence that he has written plainly shows that his letter has been composed by one who knows scarcely the outlines (let alone the details) of the subject which he discusses with so much fervour.—I am, yours, &c.

October 16, 1896. A PHARMACEUTICAL CHEMIST.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street. Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

J. W. Gavin, 85, St. Giles, Norwich, Norfolk.—*Photograph of Rev. Canon Arthur Charles Copeman.*

H. C. Parlow, 25, Chapel-street, Hythe, Kent.—*Photograph of Sketch entitled, "A Vision of a Night at Hythe."*

RECEIVED.—VICTOR THOMAS; CHLORO-PLATINATE; AN ANXIOUS INQUIRER; C. FRYATT; G. PRESTON, and others. In our next.

STUDIO.—R. A. L. P. H. So far as one can judge from the plan, there would be no good in putting a window where suggested; indeed, it would be harmful, as introducing more front light, and there is too much of that already. Let well alone.

PAPER FOR COLLODIO-CHLORIDE.—S. WILSON. We do not know any one in this country who supplies a suitable baryta for this work in small quantities. It may, we know, be obtained in retail quantities from either Romain Talbot, Berlin, or Liesegang, Düsseldorf.

RELIEFS.—MOULD writes: "Can moulds be cast in fusible metal from 'swelled gelatine' reliefs?"—No, not direct, as the heat of the metal, low as it would be, is sufficient to melt the gelatine. Plaster of Paris casts may be taken, and from them moulds in the fusible metal.

CARBON PRINTING ON ROUGH PAPER.—B. A. CAMBS asks: "How are carbon prints on the very rough paper one sees at the Exhibition produced? How is it possible to transfer the image from either flexible support or from glass on to that kind of paper?"—The prints are all, we believe, produced by the single transfer method. Double transfer is not suited for very rough paper.

ILLEGAL EXHIBITION OF PORTRAITS.—W. W. Certainly the father of the child can prevent you from exhibiting the portrait in the window, and, in doing so, will put you to unpleasant law costs. The best thing you can do is to remove the picture at once, and tender an apology. Your having gone to the expense of having the portrait enlarged and coloured is no affair of the parents.

LENS FOR LANTERN.—T. FORDEN. The No. 1 B lens will be the best amongst your stock for the lantern, though it is of a little longer focus than lanterns are generally fitted with. If you use the lantern, as you propose to do, for enlarging purposes, as well as for projecting, then the lens in question will be better than the regular lantern lenses, because its optical and chemical foci are coincident.

PHOTO-LITHOGRAPHY; PHOTO-ZINCOGRAPHY.—J. C. says: "I will feel grateful for the information, through your columns, whether there is any book published giving a full practical treatise upon photo-lithography. I would also like to know of anything on photo-zincography."—In reply: *Photo-lithography*, by G. Fritz (translated by Mr. E. J. Wall), published by Dawbarn & Ward, Farringdon-avenue, price 3*s*. We believe, the book also treats of zinco work.

WOODBURYTYPE.—T. says: "Can you refer me to any book on Woodburytype printing, or, failing this, to any account of it from which an idea could be obtained as to the cost of plant, &c., required to work it in its most modern form, and also working instructions?"—In reply: Messrs. Marion & Co., Soho-square, publish a *Practical Guide to Photo-mechanical Printing Processes*, by W. K. Burton (price 4*s*.), which possibly gives the information you want.

MOUNTS.—EDGAR SCAMMELL inquires: "Do you consider mounts fit for photographic use which, upon the application of moist blue litmus paper to their surface, turn same red in a course of a few minutes?"—We do not, if the redness is due to acid in the mounts; but, if it be due to colouring matter with which the mount is tinted, the case may be different. Colouring matter that may stain a wet print need not necessarily have otherwise an injurious action upon it.

DEFECT IN LENS.—R. SMELLEY. 1. There is not much the matter, it is only the glasses of the combination coming uncemented. Any photographic lens maker will set the matter right by simply recementing the glasses. Although this is a very simple matter, we should not recommend you to attempt the work yourself. 2. With regard to the chips on the other combination, they will do no practical harm, though it will be well to just touch them over with black varnish to avoid reflections.

FOGGY NEGATIVE.—ROGO says: "Is there any remedy for the fogginess of negative from which I enclose rough print? It was developed partly with pyro and ammonia, washed, and finished with pyro soda. I blame this change of developers to the fog, and, if you could say if anything can be done with it, I should feel grateful."—In reply: By carefully reducing with ferridcyanide of potassium and hypo, you may get rid of some of the veil. You would then, of course, have to intensify the deposit.

SAVING RESIDUES, &C.—DEVONSHIRE says: "A scientific gentleman gave me to understand that the print-out papers did not contain more than one half grain of silver to the sheet. Kindly give me your opinion in the matter in your next issue, as, if such is the case, the clippings are not worth saving, I at the present having not less than fifty pounds' weight of clippings."—In reply: We cannot at the moment lay our hands on precise information, but we think your scientific friend was wrongly informed. However, we should recommend you to keep both clippings and the wash waters before toning.

DYES FOR ORTHOCHROMATIC PHOTOGRAPHY.—HELIOS. Brilliant yellow can be obtained of Messrs. A. Leonhardt & Co., of Mulheim, near Frankfort-on-Maine. As to the other dyes, no doubt, if you address Mr. F. E. Ives at 119, Shaftesbury-avenue, London, W.C., he will give you the information you require. Sorry we cannot lay our hands upon it.

FERROTYPE.—C. CLIFFORD asks: "1. Can you give me a formula for a collodion emulsion that will give positive pictures (ferrotype dry plates, same as used in the simplex machines), or would the ordinary collodion bromide emulsion answer this purpose. 2. Where can I obtain gun-cotton?"—1. We do not know the formula by which the plates named are prepared, as it is not published. Probably one or other of the formulæ in the ALMANAC for the current year will answer with a little modification. 2. A suitable pyroxyline for collodion emulsion may be obtained from Messrs. Rouch, 161, Strand.

NATURALISTIC FOCUSSING.—GWYNFA says: "Last week I had the sight of some photographs, studies of draped figures with wood scenes for backgrounds, taken out doors. The great thing about them was, that they were all out of focus except the face. At a distance they seemed sharp, but, on examining same from the face, it crept away into a mist, thus giving a most striking effect. Can you explain how this effect is obtained?"—In reply: Probably the pictures were "naturalistically" focussed—that is to say, focally speaking, everything else was subordinated to the principal object. Possibly, also, a Dallmeyer-Bergheim lens was used.

ENAMELLING PRINTS.—J. G. MARTIN writes: "I have lately tried to enamel prints by squeegeeing on to plate glass, but somehow I cannot succeed because of dull spots over the print, which, I think, are caused by parts of it not adhering to the glass, and which I do not know how to remedy. Perhaps you would kindly let me know how to successfully treat them."—Our correspondent does not say what kind of prints he desires to enamel. However, perfect contact is easily secured if the print and glass are brought into contact under water. In the case of albumen prints, the glass should be coated with collodion after it has been French-chalked, and the print immersed in a weak solution of gelatine before it is squeegeed on to the plate.

CONSUMPTION OF GOLD IN TONING.—PRINTER writes: "My employer complains of the quantity of gold I use. He says his brother's printer only uses two-thirds of the gold I do for a given quantity of paper. I don't know how he manages it, because I know he cannot be more careful in working than I am. There is this difference in our prints (and that is the reason of my writing), although the same paper is used, and the same formula for toning bath, their prints are only toned to a warm brown, my governor will have purple blacks. Will that account for the greater consumption of gold?"—Yes. The deeper the prints are toned the greater must be the gold deposited upon them. Hence the larger consumption. Point this out to your employer the next time he complains.

DIAPHRAGM APERTURES.—FOCUS says: "I should be pleased if you could, through your valuable columns, explain to me the *f* method of photographic lenses. How is the relative value of stops calculated for lenses of various focal lengths, &c.? All my lenses were made before the *f* method was popularised, and, though I know exactly what each stop in each lens will accomplish, yet I am thoroughly at sea when my amateur friends with exposure meters, &c., mention, say, *f*-32, *f*-16, &c."—In reply: The matter is very simple: *f*-32 or *f*-16, as the case may be, simply means that the diameter of the diaphragm opening is one-thirty-second or one-sixteenth the focal length of the lens. According to the Royal Photographic Society's standards, *f*-4 is taken as unit; the next smaller is *f*-5·6, then *f*-8, and so on to *f*-11·3, *f*-16, *f*-22·6, *f*-32, *f*-45.2, and *f*-64. In practice, the exposure required with *f*-5·6 would be double that of *f*-4; with *f*-8, double that of *f*-5 6, and so on. If you require further information, write again.

LENS, SHUTTER, &C.—W. K. S. says: "I shall be greatly obliged if you can inform me if I can purchase a doublet lens for about 3*l*. or 3*l*. 10*s*. for my quarter-plate hand camera, and what would be the largest figure (portrait) I could get fully defined in shadow at ten, fifteen, or twenty feet, and who would be the best maker to go to? I should also be glad to know if I can use my present shutter, that works in front of my lens, and is detached from the lens, provided I altered the aperture to the size of the doublet worked at, or should I have to make the aperture still larger, allowing it worked, say, within a quarter or three-eighths of an inch of the lens?"—In reply: 1. For the price named, a good five-inch doublet may be obtained; but, as we never make recommendations of particular makes of apparatus, we are obliged to leave you to make your own selection. 2. Three inches, two inches, and one and a half inches approximately, assuming the figure to be five feet eight inches high. 3. A little larger.

ALUM AND HYPO; THE ARTIGUE PROCESS.—ALUM HYPO says: "1. About a year or more ago you published an article (an editorial, I think) giving the reactions which take place in an alum-hypo bath, that is, the products which are formed when alum is added to the hypo solution. Will you kindly give me the action again, as I am unable to locate the article? 2. Regarding the Artigue carbon process, is it patented in America? and, if so, can you give me the address of the patentee, or forward my letter to him? We, no doubt, could make it profitable for him if the process is all that is claimed for it. If it is not patented, can you say how it is made? 3. What is your opinion of it? I see very many contradictory reports of it."—In reply: 1. Can you refer to the JOURNAL of April 19, 1895, in which a very exhaustive article on the subject appears? 2. We do not know if the process is patented in America. Details of the preparation of the paper have not been published. We will ascertain M. Artigue's address for you by next week, so that you may communicate with him direct. 3. We have seen results on Artigue paper comparable to the finest platinum prints.

THE BRITISH

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EX CATHEDRÂ.

We are informed that an Exhibition of Photographic Portraiture will be opened at the Camera Club on Tuesday, November 2, and will be continued until Tuesday, December 8, inclusive. The collection will consist almost exclusively of pure portraiture, and will include some of the best portraits shown at past Exhibitions as well as newer pictures. Such an Exhibition should prove attractive, inasmuch as counterfeit presentments of famous men and beautiful women never fail to draw interested attention and comment, either from pictorial treatment of the subject or from the fame and personality of the originals. Contributions have already been promised by many well-known workers including Messrs. Cameron, H. P. & R. W. Robinson, W. E. Debenham, Craig Annan, Craigie, Walery, Lambert, Watmough Webster, Lyonel Clark, J. Stuart, W. Crooke, R. Faulkner, A. Ellis, E. Calland, T. Manly, F. Hollyer, and Mrs. Brian Hodgson.

* * *

The members of the Linked Ring gave, at the Dudley Gallery, on Friday evening, October 23, a smoking *conversazione*, inviting a large number of guests to partake of their hospitality. A short but entertaining musical programme was gone through. Mr. Malan and Mr. F. Nathan performed on the banjo, Mr. H. Clifford Bennett sang, Mr. Harting recited, and Mr. David Devant gave a shadowgraphic display. Mr. Maskell and the other members of the Ring present were assiduous in their attentions to the guests, among whom were Messrs. Francis Cobb, E. R. Ashton, Rev. F. C. Lambert, Messrs. Rowland Briant, Thomas Manly, Lyddell Sawyer, W. Crooke, Fred Hollyer, J. B. B. Wellington, R. W. Robinson, H. E. Davis, Valentine Blanchard, Lionel C. Bennett, W. L. Colls, G. H. James, R. P. Drage, Assheton Smith, H. Snowden Ward, Fleetwood Pritchard, R. B. Lodge, Major Lysaght, Arthur Allingham, C. E. Pearce, James Cadett, J. Bulbeck, T. Bedding, J. J. Acworth, A. J. Golding, W. Thomas, R. Child Bayley, F. Carruthers Gould, O. Huskisson, General Burlton, E. J. Wall, Chas. F. Robinson, Rev. J. R. C. Gale, Messrs. C. R. Rowe, G. Davison, Harvey Löhr, J. Fuerst, Horsley Hinton, Rev. R. Fowler, Messrs. E. Calland, A. Mackie, H. Hay Cameron, Wilson Noble, &c.

* * *

Photography in the Technology of Explosives is the title of a paper recently read before the Federated Institution of Mining Engineers by Mr. Alfred Sierch. The aim of the author was to utilise photography as a means of measuring the nature and intensity of explosive flashes, so as to confirm the generally accepted opinion that the safety of an explosive increases in proportion as the flash decreases. Mr. Sierch finds that photography affords a better means of determining the nature and manner of the decomposition of the explosive than either analysis or ignition tests, excluding, moreover, when carefully employed, all risk of error. Photography shows undoubtedly that each variety of explosive is characterised by its distinctive flash, this being especially manifested by photographic pictures obtained in the case of two different explosives suspended one above the other and ignited simultaneously. This fact by itself, he adds, indicates a certain regularity of decomposition and invites one to a closer investigation. To the expert it foreshadows the possibility of obtaining a clearer insight into the value of an explosive material, it being important to him to ascertain in the quickest manner the action of the individual constituents, the correctness of the method of preparation, and the influence of the different mixtures. To the mining engineer it will afford a ready means for convincing himself in the simplest manner of the relative security of the explosives employed, as few collieries are provided with

an experimental gallery suitable for making experiments with explosives, and, moreover, such tests occupy much more time than is required for taking a photograph.

* * *

Mr. Sierch then goes on to detail the results of a number of experiments in photographing explosive compounds, thirty-three excellent collotype reproductions from his negatives being appended to the paper. A sketch of the photographic installation is given, from which it appears that Mr. Sierch's method of working was to place the camera on a studio stand behind a wooden partition, a small movable frame providing an opening for the lens. The camera was situated about seven feet from the suspended cartridge. The photographs were taken at night time, the cartridges being electrically exploded. We have no doubt that to mining engineers Mr. Sierch's singularly successful results will be instructive and valuable.

* * *

Messrs. W. Watson & Sons, of 313, High Holborn, inform us that they are about to put on the market a very much improved form of focus tube, in which the electrodes are widely separated, so that there is no chance of sparking between them outside the tube; also, by a simple device, the whole of the cathodic stream impinges upon the platinum anode, and a special metal is used by means of which hydrogen is stored, and when the tube gets high in vacuum it is only necessary for it to be warmed by a spirit lamp for it to be at once brought to the desired pitch of exhaustion. Messrs. Watson state these tubes are much more brilliant than any other form that they have yet seen.

* * *

Mr. C. P. Goerz, of Berlin, the maker of the well-known double anastigmat lenses, was recently the recipient at the hands of the German Emperor of a gold medal presented by the State for industrial progress.

ACETYLENE AND THE FIRE INSURANCE COMPANIES.

We deem it advisable, in the light of the result of certain inquiries we have been making, to expand the remarks we made on this subject last week, and to utter a word of caution to our readers. Those who are professionally engaged in photography know too well the heavy burden the insurance offices lay on their shoulders. Photography, which nowadays, in its processes, actually involves less risk of fire than keeping a draper's shop, is treated as a hazardous risk, and photographers' policies carry twice or thrice the premium paid by the average insurer. It is most difficult to understand why it should be so; but, when the officers of the companies are interrogated, they say, in effect, that the heads of the societies or companies meet periodically to compare notes, and the result has been to show that so many claims have been made by photographers that the high rate asked is necessary. One reason they give is that, when a fire does occur, the losses are always heavy on account of the easily damaged nature of the stock. We can scarcely believe this. A few rolls of silk, for example, might represent many score of pounds, and a jet of water or the action of heat might damage them easily. Possibly ill luck usually attends the photographer in this direction. We know of one professional photographer who was so unfortunate as to have six or seven fires in the town of his adoption, and whose ill luck was so persistent that he had other fires again when he commenced business afresh in another town. As he appears now to be permanently residing abroad, where he went with some haste after his last fire, he would not have to be reckoned with. Perhaps the insurance companies have experience of other equally unlucky men in the photographic ranks. Be that as it may, our readers may rest assured they will not be able to enjoy the conveniences promised from the use of acetylene gas without paying for them.

The following two paragraphs are *verbatim* extracts from one of the leading organs of the insurance interests, and nothing stronger could well be said:—

"The Latest Danger.

"We have warned our readers several times against the dangers of acetylene gas, and following close upon our prophecies comes the record of terrible explosions which have taken place both in Paris and in Lyons. By some accident, either by a blow or the breaking of a screw, the contents of a cylinder were resolved into their original constituents, hydrogen and carbon. Two men were instantly killed, and every window in the factory was smashed to atoms. This acetylene was used for lighting purposes. It is produced by lime and carbon, through the intermediary of the electric furnace, forming carbide of calcium. It is highly explosive and excessively dangerous, and fire insurance companies had better take instant steps to protect themselves against this new danger.

"The second accident was at a café at Lyons, where the place was entirely wrecked, and the proprietor and his wife sustained dreadful injuries. The explosion was due to the defective fittings of the café where it took place, acetylene being used for producing the light."

"The Latest Explosive.

"We observe that a large industry has been created in the manufacture of carbide of calcium, which is, so to speak, the reservoir of acetylene gas. We have had objections of a more or less pronounced character to gasolene, naphthaline, and the various forms in which the refined products of petroleum have been used in this and other countries, but, of all the dangerous chemical compounds which have ever been submitted to the ordinary householder or the commercial man, there is nothing that can even distantly approach acetylene gas. We consider this is, without exception, the most dangerous compound that has ever been introduced to the notice of the public in the character of an illuminant, and we think that its use should be absolutely debarred by fire insurance companies under any and all conditions, at least for the present. The adoption of acetylene gas for illuminating purposes should promptly render any risk uninsurable, no matter of what class. This is all we have to say on the subject at present, but what we say is written after due deliberation and with full knowledge of the subject."

As there is every probability of numerous attempts being made during the winter to utilise the enormous advantages possessed by the new illuminant, we put ourselves in communication with a few typical insurance offices in London and in the North; they were the Phœnix, the Sun, and the Manchester Fire Insurance Company, and we stated that their replies were for publication, in full or in abstract, in these pages. The letters are very unsatisfactory, and are appended below. We selected the three companies named as being offices of large and representative businesses. Of course, there were dozens of others that would have answered our purpose equally well. Our questions asked, What position the offices took with regard to the use and manufacture on a small scale of acetylene gas, &c., and

whether their existing policies would permit its employment, or the storage of small quantities of the calcium carbide?

The reply from the Phœnix reads:—

"In reply to your letters of the 19th and 21st inst., we beg to state that the offices generally do not like the use of acetylene gas."

From the Sun we have:—

"I regret that, as this subject is still under the consideration of the offices, I am not in a position to give a definite answer to your inquiry. For myself I may, however, say that, so far as I have gone, I incline to the opinion that, with certain safeguards relating to the place where the gas is made and to the storage of the carbide, the use of acetylene gas is not more hazardous than that of ordinary coal gas."

The Manchester Fire Insurance Company say:—

"Acetylene Gas.

"As a safe means of using this gas as an illuminant does not appear to have been yet discovered, our office are not at present prepared to allow its use on premises they insure."

No words of ours are needed to point the moral here. It is perfectly evident that, if any photographer use or make acetylene gas, he does it at his own risk. If its use should be attended by any untoward event in the shape of a fire, he would find it difficult, if not impossible, to obtain redress from the office he was insured in, and that, if he received any compensation at all, it would in all probability be in the nature of a compromise, and would not cover the amount of his losses.

In conclusion, therefore, the advice we would give to every photographer who contemplates experiments with acetylene would be that, before commencing any work at all, he should call in a representative of the office he is insured in, show him the apparatus to be used, and ask for official sanction to use it and to store a specified amount of carbide under whatever conditions of storage that may be required of him. This obtained, he should have his policy endorsed with the company's permission.

Beyond that, there is no room for us to say more, and we earnestly trust our remarks may not fall on deaf ears.

The Future President of the R.A.—The question that is now exercising the mind of the Art world is, Who is to be the new President of the Royal Academy? This question, if not actually decided, will, at least, be discussed at the general assembly of the Academy, which takes place next week. The general opinion seems to be that Mr. Val Prinsep is "first favourite," and Mr. W. B. Richmond second. Many artists, however, think the honour should go to Mr. Briton Rivière. It is said that it is the first-named gentleman's social position, rather than his artistic abilities, that has secured him the probable distinction. Whoever is elected as President, it is to be hoped that he will enjoy the honour longer than did his predecessor, the late Sir John Millais.

A New Fraud.—We have often had to expose impositions in connexion with photography—the coupon frauds and the free-portrait business, for instance. The latest thing is that of a man named Mayers, who was last week charged at the Reading Quarter Sessions on ten counts with obtaining money under false pretences. His dodge was to advertise to send a handsome enlarged portrait, and a free coupon, for a word-counting competition, to every one who would send him a small portrait and 7*s*. The first prize was to be 1000*l*, the second a villa worth 500*l*., and no end of prizes of less value. Some coupons were sent, but no handsome enlarged portraits. Mr. Mayers will have no opportunity of executing orders for some time to come, as the Court sentenced him to eight months' imprisonment. It is extraordinary how easily the British public is "gulled" in connexion with photography.

Another Application of the X Rays.—At an inquiry, last week, as to the cause of the death of a person who had been attended for cancer by an alleged specialist, the question was again raised as to the genuineness of a diploma that was produced. While questioning one of the witnesses as to some clear, and some "blurred," names upon it, the Coroner (Mr. Braxton Hicks) remarked to him, according to the reports in the daily papers: "I may tell you that we have had the Röntgen rays through it, and so we know all about it." The Coroner then produced a photograph of the certificate, which showed that there was, or had been, some old writing under the names. It is further stated that "the Röntgen rays showed that the parchment, where the names were written, was particularly thin, as if something had been rubbed out and other names filled in." It is a little difficult to conceive, from the reports of the case, what has been achieved by the Röntgen rays that could not be as well done by ordinary photography. The parchment was thinner where the erasure is said to have been made than in other parts, and that is precisely what photography would have revealed, as well as a difference in colour of the two inks. By the way, is not parchment, thick or thin, transparent to the Rontgen rays? We should like to know a little more about the application of the rays, in this instance, than is given in the reports that have appeared in the daily press.

The Pharmaceutical Society and its Prosecutions.—Judges who have to try the vexatious actions so often brought by the Pharmaceutical Society, or Trades Union, have frequently expressed regret that they have no option in the matter, but must impose the five-pound fine. They sometimes, however, emphasise their expressions by refusing to give costs, or reducing them to the lowest possible point. The Society recently proceeded, in the Sheffield County Court, against a firm of wholesale grocers for selling a bottle of Teasdale's chlorodine, because it contains a trace of morphine. When Judge Waddy gave judgment, which he said he was obliged to do in favour of the plaintiffs, he reserved the question of costs. Subsequently he found that costs must follow, and he cut them down to the lowest possible, remarking that he gave costs because he was compelled to do so; had he the power, he would not do it.

In all these prosecutions the penalties and costs go to the Pharmaceutical Society, who make a good thing out of them, and also the fines paid them to avoid proceedings. How different is the case with the medical profession! At the meeting of the Incorporated Medical Practitioners' Association, on Thursday, last week, Mr. Geo. Brown, in advocating the amendment of the Medical Acts, said that the Incorporated Society should have the power to prosecute every unqualified practitioner; and also that the fines should go to the Council, and not to the police, adding, that it was unfair that medical men should be called upon to pay all the expenses in connexion with the prosecution of those who were practising illegally. It is pretty certain that, if the Pharmaceutical Society was situated as the medical profession is, as regards the fines and costs, we should hear far less of their vexatious prosecutions, alleged to be instituted for the safety of the public?

The Druggists' Trades Union naturally feel aggrieved that the public are aware that proprietary medicines having the Government stamp are the same, whether purchased at the grocer's or the oil shop for ninepence or tenpence, as they get them from the registered pharmaceutical chemist for one shilling and three half-pence. Hence, if one of these medicines happen to contain ever so small a trace of one of the things named in their Act, they are at once down upon the seller. However, the larger proportion of the patent medicines do not contain any of the scheduled articles, and they can therefore be vended by any one, and the Pharmaceutical Trade Union are helpless in the matter, so far. But now the druggists are trying to bring pressure to bear on the manufacturers, to prevent their goods being

sold at the prices they now are at the oil shop and grocer's. If they do not do this, will they be boycotted?

At the Lambeth County Court a shopkeeper was recently mulct in a penalty and costs for selling a small quantity of oxalic acid, and also for using the words "consulting chemist" on his facia and on his labels. What say ye to this, ye F.C.S.'s? A man, whatever his qualifications, must not, according to this obnoxious Act, use the word "chemist," unless he is registered by the Pharmaceutical Society, even when it is prefixed by such terms as "photographic," "consulting," &c. Some of our correspondents have claimed that it is for the safety of the public that the Act was framed. But how often are registered chemists censured for the careless way they have vended poisons to suicides, and for not complying with the law; though who ever heard of the Pharmaceutical Society taking action in the matter against *them?*

FOREIGN NEWS AND NOTES.

Platinotype Printing.—Herr Joé points out, in a recent number of the *Photographisches Wochenblatt*, that, for the hot-bath process, fairly dense negatives are required, whilst for the cold bath much thinner may be used. For obtaining more brilliant pictures, he states that the hot-bath developer should be diluted with from two to six times the quantity of water, or else two to five per cent. of a one per cent. solution of potassium bichromate should be added. The cold bath is to be preferred, and, by warming the developer, much warmer tones are to be obtained. He ascribes the yellowing of the paper to the combination of the iron salts of the sensitising solution with the fibres of the paper, and states that old paper always gives yellow whites.

The Chemical Intensity of Light.—An important paper has just been presented to the Vienna Academy of Sciences by Professor Wiesner on the chemical intensity of light. The process adopted was very similar to the photographic method of Bunsen and Roscoe, and it seems from his report that the greatest chemical activity of the light is not always at noon, but sometimes even as early as eleven a.m., and, further, that at Cairo, even with a perfectly clear sky, there was a strong depression of chemical power. Taking the paper all round, it may be assumed that the generally accepted theory of the greater actinic power of the light is that it is in the morning, and, whilst at corresponding times in the evening the light is poorer, it agrees with the results obtained by Professor Wiesner.

A New Application of Photography.—Mr. Poulson, of Bay Ridge, New York, has built for himself a new house, which, should it be followed, would open up yet another new field for the application of photography. The new house is built entirely of metal, iron, with copper as the decorative material, and most of the decorations are produced by galvano-plastic methods. As this metal can be deposited upon reliefs produced by photography, it would be decidedly a big thing for photography to have our houses decorated by galvanoplastic plaques, tiles, &c., from photographs from Nature, or copies of well-known pictures, frescoes, and other decorative objects. Naturally, one wonders whether iron would stand the weather. Some years back, the lay journalist said aluminium houses were to be the next development in "Hausindustrie."

Photographic Bas Reliefs.—The examples of bas reliefs, shown recently by Mr. Taber at the Hotel Cecil, in the Strand, remind one of the old methods of photo-sculpture, and the more recent methods of making not only bas relievo, but also intaglio plaques, a process for making which was patented not long ago. But there is one method of making bas reliefs by photography which has received but little notice, and yet which might be exceedingly useful. Every visitor to the Natural History Museum at South Kensington must have noticed the casts of fishes, and other reptiles, many of which are not quite so perfect anatomically as they might be. Why not, then, adopt the suggestion, recently made on the Continent, of making radiographs of the internal structure of fishes, birds, and suchlike creatures, printing from the negatives thus obtained on a thick film of bichromated gelatine, and after treatment with water, to dissolve out the soluble gelatine, and cast into the mould thus obtained liquid plaster of Paris; or the mould might even be used for producing galvano-plastic deposits of copper?

Keeping Developers Indefinitely.—M. Hombló, a well-known amateur of Antwerp, has added yet another terror to photography. Some amateurs, not content with a developer which will keep for a week or two, have devised certain formulæ which will keep their developing power for months. Now, M. Hombló, recognising that oxygen is the enemy that has to be combated, suggests adding to every bottle of developer a small piece of calcium carbide, which would give off acetylene, which would naturally drive out the air and fill the bottle with C_2H_2, in which the developer will keep for ever and a day. Might one not ask what becomes of the calcium? would it not form calcium carbonate, supposing that an alkaline carbonate were present, and thus set free a caustic alkali, which is not always desirable? and, *de plus*, is not acetylene, *per se*, a reducer of every silver haloid? We think so.

A Simple Combined Bath.—For some time the tendency in toning baths for gelatino-chloride paper has been towards the simple sulphocyanide and gold bath, and many and virulent have been the attacks on the combined bath. Analysing these, one comes to the conclusion that practically the lead, alum, and acids are the chief enemies against whom these attacks have been levelled. Now comes Dr. John Nicol, of the *American Amateur Photographer*, to the front and couches his lanse in favour of the simple combined bath composed of A, hypo 400 grains, water 3 ounces; B, chloride of gold 1 grain, water 1 ounce; add B to A. In this the prints tone readily, and merely require a bath of salt and water and washing after to be permanent, but he spoils the whole thing by saying that the prints need not be washed first. It is generally understood that all gelatino and collodio-chloride papers contain free organic acid, such as citric or tartaric as preservative. Might one ask whether these would not decompose the hypo, giving rise to the formation of silver subsulphide, so called by Bothamley, which is generally called sulphur toning?

ON PHOTOGRAPHING OIL PAINTINGS, WITH SPECIAL REFERENCE TO STRAMONIUM AS COLOUR SENSITISER.

[American Journal of Photography.]

We think it may safely be said that nothing in the whole range of photographic practice presents more difficulties than copying of oil paintings if one has desire to correctly render the colour tone values of the originals.

We remember the expedients had recourse to in the days of wet-plate supremacy and the dissatisfaction at the results when compared with a fine engraving from the same subject.

We were compelled to acknowledge the victory of the graver over the sunbeam, pleading the limitations of our art in extenuation, and secretly sighing for some process which might translate more literally the delicacy and depth of relative tone.

We forget the exact date, but know it was early in the history of photography that Becquerel showed that chlorophyl made plates from one-fifth to one-tenth as sensitive to red of the spectrum as to the blue or violet.

Then Mr. Tree and Dr. Vogel followed with their important discoveries in orthochromatic photography.

We remember employing these colour sensitisers and also the yellow screen, but our results were of a rather flat, tame, and unprofitable (especially commercially) nature and abandoned, having to content ourselves and our patrons with smudges of dark for the brilliant red, yellows and greens of the painting, and pleading that all blues took light and without detail or gradations.

When gelatino-bromide plates attained supremacy we were rejoiced to see that the bromide of silver more correctly translated the adactinic rays than iodised collodion. Though far from the true relations, yet often when the exposures were prolonged and very sensitive plates used behind a yellow glass screen, excellent results followed in particular cases, even without staining the film, and we were presumptuous to maintain that the claim to orthochromatic effect was a scientific delusion. But further experience convinced us of our error. We found that the yellow screen and plenty of time did not always give us the wished-for results—merely a flattening of the blue and violet portion of the painting and a general tameness of the whole.

There is no truth in the assertion sometimes made by superficial observers that the yellow screen alone will produce as good results as the combined action of the screen and sensitiser.

Now, if it is at all necessary to preserve in the copy the correct values of the painting to give an idea of its artistic qualities, orthochromatic and orthochromatic plates only can be used till we find some other method.

We have been shown prints from negatives of oil paintings declared to have been made on ordinary brom-silver-gelatine plates, with no other expedient than the interposition of colour screens.

Possibly and probably they may deceive those for whom they are intended, who look only at the final results and care nothing for the means, but it does not require much photographic experience or even the

best of eyes to detect the work of the retoucher, an elaborate work which must have taken hours to do and have cost considerable money to effect upon the negative in approximating to the colour-tone values of the original. The fine stipple of the pencil could be detected with very slight magnification.

We have seen two to three dollars' worth of retouching made upon a four by five negative. We think photography can claim but little share in the successful result; at least the colour screen can demand small thanks for the contribution.

It is hardly just to seek to nullify the triumph obtained by patient investigation, by assertions of having no truth, and to seek to substantiate the declaration by falsifying results.

All honour to those who have laboured in orthochromatic photography, and all gratitude for the generous publication of the results.

Orthochromatic photography is an acknowledged fact, although not yet attained to perfection.

The majority of failures can be traced to careless or imperfect manipulation and from the employment of plates not freshly prepared.

To be successful orthochromatically, make your own plates just as you need them, handle them with the greatest care, in almost total darkness, and develop them under cover in the most subdued light, only occasionally looking at them to note the progress of development.

I have employed the orthochromatic plate especially for copying oil portraits, and for that purpose have found the following method most successful:—

Select a brand of plates of a high degree of sensitiveness and of a thickly coated emulsion. After thoroughly dusting the film, place it on a bath composed as follows:—

Strong ammonia	1 drachm.
Water	14 ounces.

Let it lie about a minute. The object of the immersion is both to soften the film, and also to render it more sensitive.

This operation must be done with the least ruby light possible.

After the plate has been uniformly moistened, remove it and drain the edges on bibulous paper. It is now ready for the colour sensitiser, which is made as follows:—

Alcoholic tincture of thorn apple	1 drachm.
Water	10 ounces.

Thorn apple is the ordinary Jamestown or Jimson weed which grows so plentifully on waste places, the Datura stramonium of the botanist.

I make use of the green burrs or seed vessels, macerating two in an ounce of strong alcohol over night, and employ 1 drachm to the 10 or 12 ounces of water. The plate is allowed to remain in this a minute or two, covered and rocked in two directions to ensure even absorption. The plate is then drained on blotting-paper and dried in absolute darkness.

I have found the stramonium solution superior to others in the rendering of the reds and yellows, and the blues, purples, and violets are rendered with much more detail.

Vermilion, Venetian red, cinnabar, Indian red, light red, carmine, rose pink, maroon, scarlet, cherry, garnet, crimson madder, pink and light blue are given with about the same intensity. Yellow, lemon, gamboge, cadmium, ochre, Naples yellow, orange, orange having about the same intensity as cobalt blue, violet and dark purple like light red. But the greens, both dark and light, are unaffected and no better than ordinary plates. Hence the process is of no value in copying landscapes where the green predominates, but for portraiture it is admirable, rendering the flesh tints excellently and the yellow and red or blue draperies.

I make use of a deep yellow screen placed behind the lens. The exposure is about ten to twenty times as long as for the normal plate.

Any of the ordinary developers can be used. I prefer the following alkaline pyro:—

A.

Sulphite soda	10 ounces.
Salsoda	5 ,,
Water	60 ,,

B.

Pyro	1 ounce.
Sulphite soda	1 drachm.
Sulphuric acid	15 drops.
Water	6 ounces.

For development, 1 drachm B to 1 ounce of A, and 4 to 6 ounces water.

The yellow screen is made by adding alcoholic solution of primrose yellow to plain collodion. The glass must be plate glass, to avoid distortion.

The process can be advantageously employed in copying old engravings which age has yellowed, and which present so much difficulty with ordinary plates.

I have not tried the stramonium sensitiser with the yellow light of petroleum without the screen. If the light of coal oil can be employed, the time of exposure can be greatly reduced.

Of course, there are devices for lighting the subject most advantageously, but the practical worker is well acquainted with them, as they are easily accessible to the amateur.

JOHN BARTLETT.

IS A YELLOW SCREEN NECESSARY IN USING ISOCHROMATIC PLATES FOR LANDSCAPE AND STUDIO WORK?

[Photographic Times.]

Of course, it is not *necessary*. The question, put more accurately, would be, "Is there any appreciable benefit in the use of isochromatic plates in landscape and studio work without a yellow screen?" The question is one that sounds as if a quite definite answer should be forthcoming at once, but it is not. Briefly stated, its present position is this: The makers of isochromatic plates all state that these have a distinct advantage over ordinary plates for landscapes (at any rate) without a yellow screen. A few of the users of them say the same, but I am not aware that these have made comparative tests with that accuracy that would be necessary to establish the claim. If asked how they know there is an advantage, the answer is generally something such as, "Oh, just look at that! I could have got nothing like that with an ordinary plate." But this is not enough.

As it seems to me undoubtedly the case that, *could it be fully established that isochromatic plates will show even a moderate advantage in landscape and portrait work without a screen, they would entirely supersede other plates*, it is worth trying to find what evidence there is one way or the other. It is only that bugbear, the yellow screen, that prevents photographers from taking to isochromatic plates for ordinary work as well as for special work.

In the first place, it must, of course, be at once admitted that, for sunset effects, or any kind of photography when the light is yellow, they show a decided advantage; but we are not considering these special cases, but rather the usual run of those in which the light is white.

A London maker of an excellent brand of orthochromatic plates has the temerity to send out as an advertisement two landscape prints—the same subject—one purporting to be printed from a negative on an ordinary plate, the other on an orthochromatic plate without yellow screen. I say temerity, because there is so *very* little difference between the two prints. If one did not look for it, he would not notice it at all. The distance *is* a trifle better rendered in the print from the isochromatic plate than in that from the other, but the difference is such as might arise from a slight difference in exposure or of treatment in development, or from a few minutes' interval of time between the making of one exposure and of the other.

I have myself *repeatedly* made comparative experiments between ordinary plates and orthochromatic plates without yellow screen, and have been able to find no advantage in the orthochromatic plates so far as the rendering of distances is concerned. Sometimes a slight superiority would be found in the rendering by the orthochromatic plate; but, on the other hand, the advantage would sometimes show with the ordinary plate. This has been the experience of all I have known who have made actual *comparative* experiments.

On the other hand, I have, at times, noticed a perceptible superiority in the rendering of foregrounds by orthochromatic plates without yellow screen, this particularly if the foreground includes many flowers.

It is difficult to see how it is to be expected that an orthochromatic plate without yellow screen can show any superiority over an ordinary plate in rendering distances. The plate is not reduced in sensitiveness to the blue—the blue rays are not cut off—and wherein is any advantage to be found in the increased sensitiveness to yellow? A plate is rendered many times more sensitive to yellow by orthochromatising; but, then, it is about many times nothing, and the sensitiveness to yellow is still but trifling.

So far as my experience goes, I can only say, with regret, that I believe that orthochromatic, or isochromatic, plates used without yellow screen have no advantage over ordinary in the rendering of distance of landscapes, and only a slight and occasional one in the rendering of foregrounds.

The same I believe to be the case in studio work, though my own experiments have been confined to portraits in the open air and in ordinary rooms.

Even with a yellow screen the results of landscapes on orthochromatic plates are often disappointing. Captain Abney has fully given the reason for this. On the other hand, there are many landscapes which are vastly better rendered by an orthochromatic plate with a yellow screen than on an ordinary plate without.

In portrait work, the improvement in results by the use of orthochromatic plates and yellow screens is so great that I am surprised professional photographers have not taken to the use of them generally. In the case of perfect moulding and a skin of the purest colour, without fleck or spot, they may show no particular advantage; but, with the ordinary run of sitters, the superiority of the results with an orthochromatic plate and yellow screen over those with an ordinary plate are greater than would be believed without trial. Not only is the necessary amount of retouching reduced—odd-looking lines and wrinkles come out less prominently, and shadows are less deep and harsh—but results superior to what could be got by any amount of retouching are to be had.

The increase of exposure, I suppose, is the cry against the system, and it is true that about three times the exposure is necessary with isochromatic plates with yellow screen than with ordinary plates without; yet see what portraits were made in the wet-plate days; and, even using an

isochromatic plate (rapid) and a yellow screen, the exposure will be at most one-tenth that with a wet plate.

When, I wonder, are we to have an orthochromatic plate *that includes its own yellow screen?* There is nothing impossible in this. I think it was Mr. W. B. Bolton who proposed that isochromatic plates should be sent out coated with yellow-stained collodion. This would, no doubt, be expensive, and better means might be devised, but landscape workers would certainly be willing to pay a high price for an orthochromatic plate including its own yellow screen. W. K. BURTON.

PAPER NEGATIVES.

"TURNING over the leaves of an old album the other day, I came unexpectedly across two souvenirs of the anxious days when, during the temporary absence of the Editor, I ran this *Journal*," says Il Pipistrello, in the *Journal of the Photographic Society of India*. "One of the relics was a whole-plate paper negative of the Burmese pagoda in the Eden Gardens, Calcutta; the other, a bromide print from it. Both were made by Mr. T. D. La Touche, and were sent me for criticism ten years ago. I do not quite remember what I said at the time, but I am certain that the negative and print could not have then inspired in me a tithe of the admiration they now evoke. Here they lie before me, after travelling round the world, as good as on the day they were made, exactly a decade ago. They take up no space, weigh nothing, and are practically imperishable. Can any one say as much for negatives on glass and albumenised paper prints? I confess I cannot. Of the hundreds of negatives made by me ten years back I have just two left, and my prints are represented by a yellowed album, which saddens me when I look at it, reminding me, as nothing else does, of the swift lapse of time and of the days that are no more. The negative bears the following data:—'Morgan and Kidd's Argentic bromide paper, Calcutta, July, 1886. Lens—Dallmeyer's Rapid Rectilinear. Exposure 2 secs. Light clear. 7 a.m. Developer, Pyro-ammonia." Held up against the light, the first thing that strikes me is the extreme fineness of the grain of the paper. The negative exactly resembles one on glass backed with matt varnish, and that it gives prints equal in *all* respects to those obtained from glass I have very satisfactory proof before me. Though the memorandum on the paper is yellow, the ink having lost colour, the print itself is indistinguishable from one made yesterday, and I defy any one to prove it is not from a negative on glass.

"I was thinking of turning my keepsakes into 'copy,' when the *Journal* for July came to hand, and hardened my half-formed designs into settled purpose. Mr. Newton is entitled to be heard with all respect, and I should not question his decision if he had given his reasons a little more clearly. He condemns paper negatives because, 'out of some hundreds taken there is scarcely one left in a printable condition.' He does not say why they are not in a printable condition. Very probably the paper is unevenly stained, but this defect arises from imperfect manipulation, and should not help to condemn a process. Then, also, Mr. Newton has been singularly unfortunate in his experience of the grain of the paper showing, of mould and of stains. Other workers know nothing of such troubles. The only valid objection brought forward relates to the difficulty of keeping the paper flat. Yes, this is a real difficulty when larger pictures than whole-plate are taken. But I think there is a good time coming for paper-negative workers, and that the home firm incidentally referred to in your editorial note has solved the problem. This stripping film has, I firmly believe, come to stay. At present the cut sizes of the negative paper do not go beyond whole-plate, but the makers would, on requisition, use stiff flat cardboard for larger sizes, the paper, of course, being removed after development, its only object being to keep the film perfectly flat during exposure. The film itself is composed entirely of photographic gelatine, and is practically structureless.

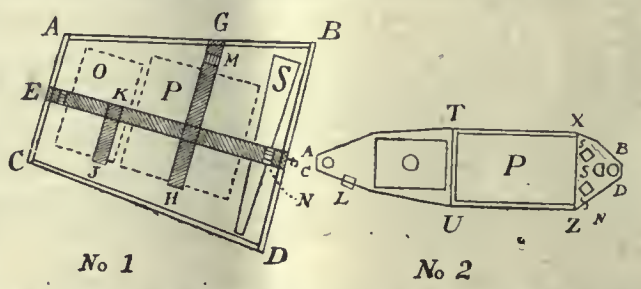
"Is it necessary to direct the attention of Indian workers to the claims of this film? In India you pay heavily for plates, because glass is so weighty—a packet of negative paper can be sent by post from England to India for a few pence. By getting it through the post you ensure the freshness of your film, and that is no light consideration in India. Then, not only is negative paper cheaper to start with than glass plates, but it is also not subject to breakage, is lighter than glass, stores in less space, admits retouching more readily, and is specially adapted to carbon printing. This last fact alone makes the film invaluable."

PHOTOGRAPHY AND THE BICYCLE.

IN answer to the article signed by Colonel J. Waterhouse, I would say, in regard to photography and the bicycle, that I have not given up altogether the idea of taking views while riding the bicycle and carrying my photo outfit with me. However, the weather is not exactly now what it should be. I have tried to improve on my former arrangements, and I have succeeded, at least, in regard to weight.

My principal aim was to reduce the weight, particularly on the front of the bicycle or handle bar. As you know that my aim is to take architectural subjects with perpendicular lines, I have to use a regular camera with rising front and a tripod; therefore an instantaneous hand camera is out of the question. I may add that I have been as yet unable to use the bicycle itself as a camera stand as being too unsteady and too low for general purposes. I have therefore made myself a camera for plates 7 × 5, which contains all requisites of lightness, with necessary adjuncts for taking architectural views, and cheapness (the whole outfit and twelve double dry-plate holders costing about 1*l.*). The whole outfit, less than four inches thick, including two double slides, fits easily inside the bicycle frame as well as the tripod, and weighs altogether, including two lenses, covers, and all, less than 9lb. I use glass plates, as much more reliable for good results, especially for enlargements, as films have an occasional bend, which is not conducive to sharpness when enlarged. You probably hear of some films which bend inwards, and some outwards, in the centre, while others have both effects at once, when these are not limited to a certain spot only.

I give you herewith a small design, which will give you an idea of my



new arrangement to carry my outfit inside the bicycle frame, and which is very light and solid at the same time. It is made of cotton strap about one inch wide.

A, B, C, D is the bicycle frame; E, F is a strap going all round front and rear tube, and closed by two buckles, L N, while at T U, and X Z, are two partitions, suitably placed to hold P, the camera in place and separate from S, the tripod, and O, another parcel (plates or extra holders). G H, with a buckle at M, holds the camera well suspended, and K J the parcel O. Where the straps cross each other they should be united. This whole outfit only weighs a few ounces, *and* may be used for any other parcels, the weight of which, being suspended from the top, always keeps it perpendicular.

You, of course, will understand that the design No. 1 shows the outfit from the side, and No. 2 from the top, omitting the cross bar and straps, which would interfere with clearness. I have made also a small package carrier to go on the handle bar, which weighs about ten ounces, but will leave this for another occasion. ALBERT LÉVY.

DRYING NEGATIVES BY HEAT.

THE patentee, Mr. Arthur Musker, states, "I apply heat, say, of a burner or lamp burning gas or oil, which acts upon a holder, base, or the like, containing or having upon it metallic plates, between which plates the negatives or photographs are adapted to be placed and held. In some cases, the heat is conveyed to such plates by having a hollow chamber or space between two metal plates, into which the gases for heating pass, or the heat may be conducted to such plates by the plate or part on which they are mounted, and to which heat is imparted by the lamp or burner.

"The action is that the plates between which the negatives or photographs are placed radiate the heat on to them to the required degree, and in a manner which renders the artificial drying by heat practicable, and without liability of in any way detrimentally affecting the quality of the negative or photograph.

"By this means negatives and photographs may be rapidly dried, and thereby the greater portion of the time they take to dry in, when dried in the ordinary way, saved."

Drawings and full description are also given, but the foregoing will enable the reader to grasp the method of carrying out the invention.

TAKING ANIMATED PHOTOGRAPHS: M. HENRI JOLY'S SYSTEM.

THE inventor, M. Henri Joly, after giving a detailed description of his invention, makes the following claims:—

1. A fold previously imparted to the film before its entering the dark chamber, the said fold remaining constant during the whole time of the displacement of the film, and thus enabling the abrupt movements, necessary for the operation of the apparatus, to merely act upon a non-extended portion of the film, and not upon the whole mass of the film.

2. In combination with the film hereinbefore claimed, two driving rollers for the film, actuated so as to receive a continuous rotary motion, and provided with two rows of points or teeth which enter into holes provided upon the edges of the film, so as to cause the latter to move along, one of the said driving rollers being placed near the magazine or

feed roller of the film, before the fold hereinbefore claimed is formed, and the other next to the dark chamber.

3. In combination with the fold imparted to the film and the two continuous driving rollers, as hereinbefore claimed, a frame actuated by a disc crank, imparting to it a to-and-fro movement, the said frame being placed beneath the dark chamber, and caused to act abruptly at equal intervals of time over the whole width of the film, so as to cause that part of the film which was previously located therein to rapidly leave the same, while forming, next to the dark chamber, a folded film to prevent the continuous driving roller from displacing that portion of the film which lies behind the dark chamber, while this latter is uncovered by the obturator (the said portion of the film being, at this moment, stationary).

4. In combination with the fold imparted to the film before its entering the dark chamber, the two continuous driving rollers, the frame with to-and-fro movement, an obturator opening the dark chamber during the stoppages of the film and closing the same during the displacements of the said film.

EXPERT TESTIMONY.

Within comparatively recent years there has arisen in our judicial system an apparent need for evidence bearing upon scientific questions requiring a knowledge not ordinarily possessed by the lay witness, and which is gradually being more and more supplied by the so-called "expert." He is paid to testify on behalf of one side or the other, and not infrequently is retained (says the *Electrical World*) to appear as often as cases arise in which his opinions are desired. That the most flagrant abuses in expert testimony have made themselves most prominent in criminal cases is perhaps to be attributed merely to the notoriety which these cases have attained. Whether it be the fault of our patent system or of our judicial system, the expert has become a prominent factor in all recent cases pertaining to patent litigation. It is not uncommon to find several experts on one side arrayed against perhaps as many more on the other, and, if each side has been able to retain men of practically equal prominence, that side having the greater number frequently produces no little effect on influencing the judicial decision. That men devoted to the interest of science should be willing to sell their opinions indiscriminately to either contending party, often being obliged to so modify their views as to make them harmonise with the unscientific but legal opinions of the counsel by whom they are employed, has become an evil which has justly brought forth criticism, must be acknowledged, and, unless modified or changed in some form, calls for future condemnation also.

In a contribution to the October number of the *Atlantic Monthly*, Professor John Trowbridge calls attention to the imperilled dignity of science and the law if the practice of indiscriminate scientific testifying is to continue. He points out the difficulty in which a Judge is placed when required to carefully weigh statements on scientific points; his attitude toward the scientific expert and the little regard he frequently holds for his opinions. He is therefore tempted to entirely ignore expert testimony, and rely upon his own common sense for framing his decision. The consequence has been that Judges may be classified under several headings, a classification based simply upon their legal decisions in the past, some being known as patent breakers and others the most strenuous advocates of broad patent claims. It is for this reason that suits are carried from court to court with the ultimate hope that a former decision will be reversed.

The result of this method has been well illustrated and can be vouched for by several of the larger manufacturing companies who have invested millions in this way during the past few years, with no immediate prospects of any material return on the investment. The chief benefit has been derived by patent lawyers and patent experts, while the stockholder has been forced to respond with the shekels. Professor Trowbridge does not, however, raise his criticisms without suggesting a remedy. It is to the effect that a Judge may call to his assistance any well-known professor of science not retained by the parties in dispute. The State should provide, and the Judge should appeal to the State for, such assistance, so that he might be aided in rendering a decision based upon scientific facts.

By this method both the standing of the bench and that of the professor would "gain in dignity, and the pursuit of truth will again be considered one of the chief characteristics of a scientific life." Whether the method suggested by Professor Trowbridge could be put in practice, and would be effective even if adopted, can only be determined by an actual trial. It is, however, well to call attention to these points, so that those who are tempted, merely from a pecuniary standpoint, to offer evidence on scientific questions, when such evidence would not be in entire accord with their best belief, may stop to consider the effective gain to be derived by so modifying their convictions as to make them harmonise with those of the contending counsel. It is not improbable that the day of the expert will soon be waning, and that the costly litigations of the past will not be duplicated in the future.

IMPROVEMENTS IN ALBUMEN PRINTING PAPER.

Herr Gustav Koppmann, the patentee of this process, says:—

"It is a well-known fact that the albumenised papers used for photographic positives lose their beautiful rose or bluish tint after a short time. Hitherto the proceeding consisted in mixing the corresponding colour solution with the albumen, covering the paper with this mixture. The colours used are the little light-proof aniline colours, mixing perfectly with the albumen.

"The above proceeding will be replaced by the following one of my invention, obviating the above-mentioned inconvenience by a more intimate combination of the dyeing material with the paper."

According to the proceeding of the applicant it is not any longer the solution of albumen which is coloured, the paper to be used being, on the contrary, evenly dyed with a layer of colour by an ordinary printing procedure. Hence the colour is brought into direct contact with the superficies of the paper, wherein precisely consists the innovation, and thus a possibility is given to employ a colour known as indifferent to light, thus, as, for instance, cobalt blue.

It is only after submitting the paper to this printing process that it is covered with albumen, and afterwards treated in the known manner, and then it is ready for being sensitised with the solution of nitrate of silver.

The above proceeding need not be limited to albumenised paper, but may be adopted wherever a constant ground colour is desirable for photographic positives.

The innovation of the proceeding consists consequently in the separation of the coloured solution, for the production of which a light-proof metallic colour, or any other as light-proof known suitable colour is made use of, from the albumen layer proper and its previous appliance.

The claim is for a coloured positive paper, wherein the coloured tint is produced by a light-proof coloured raw paper.

STEREOSCOPIC PHOTOGRAPHY.

[Abstract of paper read before the Sydney Working Men's College Photographic Club.]

Man has two eyes given him, and we may reasonably suppose, that however ornamental and beautiful they may be, and however wonderfully they act as windows for our inmost thoughts, and ofttimes speak more eloquently than lips or tongue, yet they were not made merely for ornament, but for use.

We need our eyes to see with. It matters not how lovely the landscape, how beautiful the form, how exquisite the colour; if we had no eyes, everything would be a sealed book to us, and, instead of being children of the light, we should have to spend our existence in endless night.

We need *two* eyes in order to see an object properly; hence, instead of being created with only one eye, placed, say, in our forehead, we are provided with two.

You will remember seeing on the screen the other night the eye of a fly. As he has so many things to look after and attend to, he has some thousands of eyes. We have, however, to be satisfied with two.

I have no doubt you have noticed the difference to be obtained by looking at a distant object through a telescope and an opera glass; in the one case only one eye is used, in the other two.

If we had only one eye, everything would present a flat appearance. We should not experience that effect of solidity we realise with two; and from an artistic point of view, at any rate, we know how very undesirable such a result would be. Hence it frequently happens that our photographs—when there is very little contrast of light and shade—when the light is not good, &c., have a very uninteresting, and, what is technically known as, a flat appearance.

Let any one try the experiment of walking up to a table with one eye closed, and snuffing a candle placed there. You will be rather surprised to find that, instead of performing that simple operation successfully, it will require one or two trials before you judge the right distance.

Or try to fill a tumbler placed on the same table under similar circumstances, and the chances are the water, instead of going into the tumbler, will flood the table.

Try the experiment of looking at an object first with one eye closed and then the other, without altering your position, especially some near object, and you will find that it presents quite a different appearance at one time to the other.

Hold up a photograph edgewise, look at it with one eye closed, and you are able to see the picture; close that eye, and open the other, you lose sight of the photograph, and see only the back of the card.

We really see objects from two different standpoints, in fact we get two impressions—a right-eye one and a left-eye one—in the stereoscopic camera with which each of us has been so wonderfully provided, and with which we are taking snap-shots every waking hour of our lives. The two pictures are then so combined by the mechanism of our eyes, nerves, and brain that they coalesce, and, instead of seeing double, the images are united; one picture is formed, standing out clear and solid in perfect relief.

This is just what the stereoscope does for photography. Instead of having a camera with one eye or lens, we have two lenses, really two

cameras combined, and so I say to my mind the stereoscopic camera is the most perfect of all.

The lenses are fixed about the same distance apart as the human eye, two and a half to three inches from centre to centre. The right lens takes an impression of the object from its standpoint, showing more of the right side than the left, and the left lens takes a view from its standpoint, showing more of the left side than the right, exactly in the same manner as our eyes. Thus two distinct pictures are obtained on one plate (two quarter-plates on one half-plate).

The stereoscope invented by Wheatstone, and perfected by Sir David Brewster, unites these pictures by means of two prisms arranged at a certain angle, and a stereoscopic view is the result. To a person who has never seen a stereoscopic picture, the first view is somewhat marvellous. Here you have two pictures apparently of no interest, seemingly perfectly nnmeaning—a conglomeration of dark and light patches—and on looking at them you feel inclined to pity the crank who has produced a pair of such miserable-looking things; but place them behind the magic lenses of the stereoscope, and what a transformation!

In an instant the scene is replete with life. It is not a picture you are looking at. The reality is before you; the scene in all its details is there, everything stands ont in perfect relief, everything is solid, everything real. You feel as though you had only to take one step to be in the midst of well-remembered spots, and linger long amid the beauties of hill and dale, mountain, plain, or river.

You can almost fancy you hear the breakers roar as you see them lashing in their fury the rocks at your feet; or hear the rippling rivulet dashing down the mountain glen, as it sheds its silvery spray on feathery fern and mossy boulders, murmuring its blithesome melody as it hurries to the sea; or listen to the music of the forest wild as you gaze on Nature's tangled wild-wood and peep into the lyre bird's nest in fairy dells; and scent the perfume of native musk and forest wild flowers as you see once more the mossy banks covered with delicate ferns, enamelled and bespangled in rich profusion with Nature's sweetest blooms; while, as you gaze on features well remembered, you feel it is not a portrait you are looking at, but the friend of long ago is there. You gaze into his eyes, and catch, as in days of yore, the merry twinkle lurking there, and hear once more the well-remembered music of lips long silent, which seems to float around you in notes of sweetest cadence, revibrating many a lost chord of fondest recollection, and thrilling with emotion the heart of each beholder.

We must leave our flights of fancy, however, and come to practical work.

There are three ways of practising stereoscopic photography.

1. To have a regular stereoscopic camera, and use it for that purpose only. There are many such in the market, and I need only refer you to a good catalogue, where you will find plenty from which to make a selection.

2. An ordinary half-plate camera, having a quarter or half-plate lens fitted into a sliding front. You first take a picture, say the right side, which fills one-half of your half-plate. Put on your cap, and slide the front two and a half or three inches; then take a view of the same object on the other half of the plate, having a partition down the middle of the camera.

3. An ordinary half-plate camera, having a separate front fitted with two quarter-plate lenses.

The plan I adopt is the third one. I have here a camera which I use for half-plate work of every kind. After taking my picture of a landscape, if I want a stereoscopic view of the same, all I have to do is to remove the front holding the single lens, and insert in its place the other front with two lenses. Then I place this diaphragm in, in a second, and I have virtually two cameras, my stereoscopic camera is complete. Thus, I really carry three cameras with me; and I can take half-plate, quarter-plate, or stereoscopic views. Very successful work *may* be done with one lens, provided the conditions of light, exposure, &c., be the same; but, to have perfect work, the two pictures must be taken at the same instant, thus necessitating the use of the stereoscopic camera proper.

Having your camera and dark slides ready, the manipulations of focussing, exposure, development, and printing are exactly the same as for ordinary photography.

In taking a stereoscopic picture you can leave your tomahawk at home, because what you would cut away to enable yon to get a good view for an ordinary photograph will, in all probability, make a very interesting part of your stereoscopic view. A little more trouble is caused in mounting stereos than ordinary cards. It is necessary that the print taken by the right-eye lens is placed opposite the right eye, that by the left opposite the other one, when mounting them. I have a print here just out of the printing frame, and you see it is quite the reverse. This side was opposite the right lens, and this the left. It is necessary, therefore, to divide them, and mount on the card in such a way that the above conditions are fulfilled.

Before they are divided, it is best to mark them. I always put the letter R at the back of the half which was opposite the right lens, and then there can be no mistake, because, unless they are mounted in this manner, the stereoscopic effect will not be produced. If you were to mount two photographs taken by the right lens, or two taken by the left lens, no stereoscopic effect would be seen, nor would any such effect be had if two ordinary photographs be mounted on one card, and looked at through the *stercoscope*. You must have two distinct pictures, taken from two different positions, of the same object; and, however poor and tame they may appear, the stereoscope makes them instinct with life.

In mounting stereos, I use a piece of glass the exact width of the stereos—three and a quarter inches—and the length of the negative; in fact, I cut a negative to that width. I first place this on the print in such a position that I get a twig, or stone, or any object in both pictures in a straight line. I then trim the top and bottom to this width, thus ensuring that my pictures are in the same position. I next take two pieces of glass, three inches and a quarter by two inches and three-quarters, and place them on my prints in such a manner that they both cover the same object. It becomes then an easy matter to trim them to the exact size, when they can be mounted, making sure that the one marked R goes to the right.

The stereoscopic views can be printed on glass, in the same way as a lantern transparency. You can either have a single plate, five and a half inches by three and a quarter inches, or take two ordinary lantern plates, and bind them together after printing. I should like to say one or two words on the advantages of stereoscopic photography.

First, and chief, a more realistic picture is obtained, and greater pleasure afforded.

Second, the same picture can be used as an ordinary quarter-plate one.

Third, you have two negatives to print from for this purpose instead of one, which is an advantage if a number of copies be required.

Fourth, enlargements can be made from them very easily.

Fifth, the negatives are just the size for lantern transparencies.

T. C. Camm.

A NOVEL ETCHING PROCESS.

Travelling through Utah and on the way, I stopped at Salt Lake City, and during a conversation with a newspaper man, talking of engraving, he mentioned to me a new process just started in town by a party, of etching in onyx. This aroused my curiosity at once, says Mr. Chas. Chetham in *The Practical Process Worker*, and, wishing to see something of it, we hunted up the party and saw the affair. This onyx, to my view, seems to be only stalactites, and has not the many colours of Arizona onyx, and, being a lime formation, naturally has great affinity for acid. The onyx is produced in inexhaustible quantities from a mine near by, and easily cut and polished, which Arizona onyx is not. The slabs are cut type high and take a good polish, and can be produced at about ten cents per foot; the designs can be drawn on it or printed by the usual Bi Chr. Albumen solution only; for larger cuts the negative is coated with a heavier solution of stripping solution, for the reason that, instead of placing on glass reversed, it is squeegeed direct on to the sensitive coated slab, which is operated thus:—

The slab of onyx is laid on a level, and the solution is flowed over and excess drained off; it is dried by a gasoline lamp, like painters use, which throws out a long flame; this is flashed over the slab without touching with the flame and quickly dried; then it is rolled over with castor oil, and the negative gently rubbed down with the finger on a piece of woollen rag, absolute contact is secured, and no danger of breaking glass or the necessity of using printing frames. When exposed and ready for development, the film is lifted off and the oil removed with a rag saturated with turpentine; it is rolled up the usual way and developed, dried with a chamois skin powdered with dragon's blood, etched as usual, using nitric acid instead of muriatic, which is too violent in action. The etchings are effected by repeated rolling up and powdering. Of course, the four ways could not be used, owing to the nature of the material and difficulty of handling a thick slab, and poor conducting power, &c. The burning in is done with the same hand lamp and very quickly the etching proceeds till the requisite depth is secured. The close work is then stoppered out and the larger plans etched in strong acid. The router cannot be used, as the onyx is too hard and would quickly spoil the cutters, though the sand blast could be used to advantage if procurable. The slab can be cut by a saw to the requisite size and it is ready for the press. It can be stereotyped or electrotyped half-tone or finer work, if especially desirable for this process, and the people who control the affair are confident of a good thing, but the really practical photo-engraver need not fear any offensive competition, when in large establishments great quantities of work can be more easily done by the present methods.

The only real use it is adapted to is for ornamental purposes, such as tiling and decorative uses; ornamental designs are drawn on and etched, and can be filled in with gold or colours, or left in relief.

THE WELSBACH PATENTS IN THE GERMAN COURTS.

"On appeal, the Court has amended the Welsbach patents as follows:—Chief patent, 39,162. Claims 1 and 2 struck out, and Claim 3 limited as follows: The method set forth in the description, says the *Gas World*, of making incandescent bodies for incandescence burners out of the there described molecular mixtures of (*a*) lanthanis, yttria, and magnesia; (*b*) lanthania and magnesia; (*c*) lanthania and yttria; (*d*) yttria and

magnesia; (*e*) zirconia, lanthania, and yttria; (*f*) zirconia and lanthania; or (*g*) zirconia and yttria; wherein the yttria may be replaced by a mixture of the so-called ytterite earths, the lanthania by a mixture of cerite earths free from didymium and containing little cerium, for white light; with addition of neodymzirconia to the mixtures for yellow light; with addition of erbia to one of the mixtures for green light or greenish light; through impregnation of tubular tissues, best prepared from vegetable fibre, eventually folded into shape, with the aid of the nitrates, sulphates, or equivalent soluble compounds.

"Patent 41,945. Claims 1, 2, and 4 replaced by the following:—In the method set forth in Claim 3 of the main patent, the addition of thoria to the mixtures there specified, as described in the previous patent. Claim 3 to stand. Claim 5 to read: In the method set forth in Claim 3 of the main patent and in 1 and 3 of this, for the production of a constant bright and yellow light, the addition of ceria to the mixtures as previously described. Claim 6, replacing zirconia and magnesia in patent 39,162 by thoria, so that the following mixtures may be used: (*a*) lanthania, yttria, and thoria; (*b*) lanthania and thoria; (*c*) yttria and thoria.

"Patent 74,745. Claim 1, add 'as described.' Claim 2, addition of thoria and uranium oxide to the mixtures specified in 39,162. Claim 3, the same addition to the mixtures specified in 41,945.

"The consequence of this judgment is that both parties claim substantial victory. The Welsbach Company rejoices that Claim 3 of the second patent, that is, the claim for the use of thoria, is to stand, instead of being cancelled; the opponents rejoice in the cancelling of the first two claims of the main patent, which they look upon as the basis of the Welsbach patent, the use, namely, of mantles made according to the method described; but, on the other hand, the phraseology of these claims has been carried almost bodily over into the amended form of Claim 3. The mixtures specified in 39,162 have now almost no practical value, for the practical material is mainly thoria."

THE CITY AND GUILDS OF LONDON INSTITUTE.

Report of the Examination Department.

By the courtesy of Sir Philip Magnus, we have received a copy of the report of the Examinations Department of the City and Guilds of London Institute. It deals with the examinations held in 1896 In the section devoted to photography there were 168 candidates. In the Honours grade seven passed, seventeen ranked "second," and thirty-two failed. In the ordinary, eighteen were marked "first"; fifty-four second, and forty failed. Thus there were ninety-six passes, and seventy-two failures.

With regard to the examination in photography, the report says:—

"The scheme of examination in photography has been very frequently modified in consequence of the rapidly changing condition of the trade, and a further alteration has been introduced into this year's programme, by which all candidates will be required to have passed a local practical examination before presenting themselves for the Institute's examination in the Ordinary Grade. This local examination may be held at any time between January 1 and March 12, and will be conducted by competent experts, to be locally appointed with the approval of the Institute. The object of this examination is to satisfy the Institute that the candidates have already acquired some practical knowledge of the subject before presenting themselves for the technical examination. It will be noted that the examiner in photography deprecates the system of teaching only some specific branch of the subject, and reports that 'there is no school in England where they teach photography generally.' The course of study recommended by the Institute is intended to afford an elementary knowledge of the general principles of photography, and a fuller and more detailed, and, at the same time, a practical acquaintance with some particular branch of the subject."

The following is an extract from the Examiner's report:—

"Section I. (Pure Photography).

"The answers in the Ordinary Grade have been particularly good, but in the Honours Section they are very poor. The candidates show a complete want of general photographic knowledge. This is, I am afraid, the result of the educational system. There is no school in England where they teach photography generally. The students learn only a few specific subjects, a knowledge of which they think they want. The result is very unsatisfactory, and will remain so until we have a school where students can learn photography as they learn other scientific subjects.

"Section II. (Photo-mechanical Processes).

"There has been a satisfactory increase in the number of candidates presenting themselves for examination in the Photo-mechanical Sections this year, partly due, no doubt, to a growing demand in this country for greater technical excellence in the quality of the work, and partly because of the increased facilities for practical instruction afforded by the Polytechnic and other technical institutions.

"The answers to the questions show an intelligent study of the subjects to which the student has directed his attention, but there is a strongly marked tendency on the part of nearly all the candidates to take up only one or two of the Photo-mechanical Sections. The two best papers indicate sound, practical knowledge of the subjects all round, but there are several of the papers, and practical work, which, though they do not stand high as to marks, are excellent so far as the single subjects taken up are concerned."

Those of our readers who are interested in the subject will find in the Journal of August 28 last the questions in the photographic examination that are to be set next May, as well as those that were set in the examination held in May of this year.

The Inquirer.

*** In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the Journal useful and instructive.*

Damaged Negative Surface.—In reply to "Alum," if he thoroughly soaks the negative, any markings that remain will be harmless, as they do not show on printing. Indeed, even when the crystals are still in and on the film, it is only in sunlight printing that they will show. Varnishes still further improve the appearance of the negative.—Syntax.

Bisulphite of Soda.—In reply to "Economy," Jerome writes: "If you substitute methyl orange for litmus as the 'indicator,' you will not experience any trouble in the matter of neutralising the bisulphite, especially if you employ sodium hydrate. Turmeric, I believe, is a good indicator for sulphurous acid, and would be perhaps better than the above, if carbonate of soda is used."

Sunset.—C. Fryatt asks: "Could you inform me why it is the sun sets twenty-five minutes after the time stated in your Almanac; in fact, not only yours, but all the others I have referred to? I am, no doubt, awfully ignorant, but it has puzzled me greatly, and I have asked so many people, but they cannot tell me. I first discovered it about a month ago rushing home to photograph a glorious sunset, and ever since I have timed it when possible."

Nikoda Paper.—Chloro-platinate says: "A paper for matt printing called the 'Nikoda' has been frequently advertised in The British Journal Photographic Almanac and in other publications by a dealer named Mucklow. Can any of your readers let me know if they have had any experience of it? I have applied over and over again for prices and specimens of it, and twice sought to obtain it through dealers, and begin to think it must be a myth."

Defective Spirit Level.—J. Smith says in reply to "W. J. C.": "If you gently heat the level as hot as the hand will bear, and then immerse it in methylated alcohol, the expansion and contraction of the vapour it contains will suck in more spirit. If the first attempt does not introduce sufficient, the process can be repeated until the desired result is attained. If the aperture is very small, it will sometimes prove a very tedious job refilling, consequently every precaution should be taken to prevent leakage. To effect this, let the screw which closes the aperture be freely lubricated with indiarubber cement, and, finally, to make assurance doubly sure, paint it over outside with thick gelatine."

Magnesium Flash Paper.—W. B. writes: "P. Stow will find it a far better plan to first convert the paper into gun-cotton, or papyroxyline, to ensure its combustion. He can afterwards saturate it with chlorate of potash, if he likes to ensure more rapid and perfect action. Probably too much paste was used in its preparation, which, by burying the chlorate of potash, rendered it practically inflammable." In reply to the same query, Syntax says: "Let P. Stow immerse his paper, ordinary tissue paper answers best, in a mixture of equal parts of nitric and sulphuric acids, cooled down to about 80° F., for ten minutes. This will convert it into papyróxyline, which should be well washed to remove all excess of acid, and then dried. It may, in addition, be soaked, before drying, in hot saturated solution of chlorate of potash, which will assist in the rapid and perfect combustion of the magnesium. Apparently your correspondent uses some paste to cause the magnesium to adhere; this is not a good plan, as the sizing so applied operates against the combustion of the paper. Better to simply fold the

powder in the paper, or to gum the *edges* of two pieces, and place the powder between. Another plan I have adopted is to fold magnesium ribbon in strips of papyroxyline, to form a sort of spill."

Our Editorial Table.

Christmas and New-year's Cards, Calendars, &c.

C. W. Faulkner & Co., 41, Jewin-street, E.C.

Messrs. Faulkner have submitted to us a number of specimens of their Christmas and New-year's publications. First comes a series of platinotype and photogravure reproductions of popular pictures by well-known artists, the subjects being so chosen as to gratify popular tastes in the matter of humour and sentiment—Ludlow, Kilburne, Couldery, Henry Ryland, Slocombe, and Tarrant being among those whose works are reproduced. The photographs are beautifully done, and are in such sizes and styles as to make them eminently suitable for framing and presentation.

The Christmas and New-year's Cards of Messrs. Faulkner, of which they have about a thousand different designs, are bewildering in their beauty and elegance. There would appear, from the pretty specimens shown to us, to be still a considerable demand for cards in colours, and those before us are as varied as they are pretty. We are, however, more interested in the photographic cards, bearing what appear to be well-executed little pictures in platinum. The designs and printing of the mounts are always in good taste, the pictures are capitally made, and the series is one which, combining faultless selection with elegance of execution, is assured of great popularity amongst photographers, stationers, printsellers, &c. Illuminated calendars, with spaces left for advertising purposes, and cheap and amusing little games for both young and old, are also among the specialities to which Messrs. Faulkner have drawn our attention. With Messrs. Faulkner's assistance many a country photographer might make a corner of his window attractive and profitable next December.

Modern Developers.

Fuerst Bros., 17, Philpot-lane, E.C.

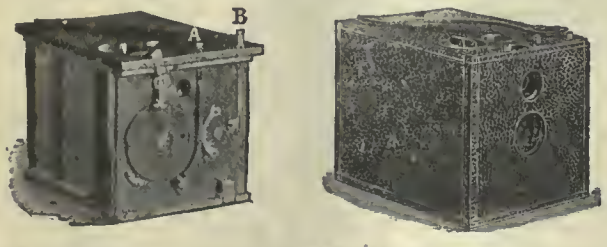
This little handbook, the compilation of Mr. J. Fuerst, concerns itself with Amidol-Hauff, Metol-Hauff, and Glycin-Hauff, the properties of each of which are succinctly set forth. Formulæ for their successful use are also given, both in cubic centimetres and grammes, and ounces and grains. There are many useful practical hints to be picked up from Mr. Fuerst's pages, which will repay careful perusal by those who work with "modern" developers, and are anxious to secure the best results therewith.

The Bull's-eye Camera.

The Eastman Photographic Materials Company, 115, Oxford-street, W.

Our photographic companion on the occasion of a recent brief river trip on one of the Aberdeen Steam Navigation Company's fine vessels was a Bull's-eye camera, and we are therefore enabled to speak from practical experience as to the working of what is at once an ingenious and workmanlike little instrument, more especially with reference to the immense convenience it allows of daylight changing.

Here is the system briefly described. The body of the camera is removed from its outer case, and the spool of sensitive celluloid (which is, of course, covered with light-tight paper) is placed in position. The paper covering is cut, threaded under cross pieces and over rollers into the slot of a reel, upon which, by turning a key, it is tightly secured, and the body of the camera is then replaced in its case.



A few more revolutions of the key are made until from the back of the camera it is seen, through an aperture of red glass, that No. 1 film is in position. The exposure is made, No. 2 is turned into position, exposed, and so on down the whole available length of the film. When the last exposure is made, film and paper are tightly wound round the reel, and are then removed from the camera, the gummed edge of the paper moistened and secured, and there is your reel of exposed film safely to be handled in daylight, the while a fresh spool of unexposed film is placed in the camera ready for use.

The little camera, which gives pictures $3\frac{1}{2} \times 3\frac{1}{2}$, is a cleverly thought-out piece of apparatus, and in use is the *beau idéal* of a simple and effective snap-shot instrument. It is fitted with a finder; a controllable shutter, and diaphragm plate. The convenience of daylight changing should make it a great favourite with those—an increasing number—of whom a hand camera of some kind is almost an inseparable companion.

Fallowfield's Christmas and New-year's Photographic Mounts.

Jonathan Fallowfield, 146 Charing Cross-road, W.C.

Mr. Fallowfield, as usual, shows us some samples of mounts suitable for holding photographs that are exchanged between friends at the Christmas and New-year seasons. The mounts are varied and effective in design, and are calculated to afford opportunities for the





gratification of many tastes. Some are plain embossed; others have inscriptions in silver and in colours, while a plentiful choice of colour as regards the mounts themselves is obtainable. Slip-in spaces for the photographs are provided, as shown in the illustration. These mounts will assuredly be popular with photographers and the public.

News and Notes.

Messrs. Gowans & Gray, Glasgow, and Messrs. S. W. Partridge & Co., London, will issue immediately a new handy-sized illustrated Bible, containing 135 views from photographs of the Holy Land.

Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, November 4. Annual General Meeting.

We are asked to state that the latest date for the receipt of entry forms for the Hackney Photographic Society's Exhibition has been fixed for Monday, November 2, by which day they should reach the Hon. Secretary (Mr. W. F. Fenton-Jones), 12, King Edward-road, Hackney, N.E.

A young man who had been used for about four weeks as an object for demonstrating X-rays phenomena discovered to his surprise that his skin was peeling off at the places which had been exposed to the rays, causing sores in some places. He also began to lose his hair, and is now threatened with premature baldness.—*Elektroteohnische Rundschau.*

Mr. S. H. Fry, of 12, South Villas, Camden-square, N.W., writes: "In the report of the proceedings of the Photographic Club, which appeared in your columns last week, Mr. Naegali was stated to be the Chairman. This was an error. Mr. Stretton occupied that position, and I shall be much obliged to you for an opportunity of correcting the mistake."

The Syndics of the Cambridge University Press, says the *Publishers' Circular*, will shortly publish the *Autobiography of Sir George Biddell Airy*, edited by his son, Mr. Wilfrid Airy. The autobiography opens with his early school days, and contains chapters on his studies as an undergraduate at Cambridge, and his subsequent work at Cambridge Observatory as Plumian Professor, as well as a full record of his scientific labours during his long tenure of the office of Astronomer Royal. Abundant materials for the preparation of this book were available in the chapter of his autobiography which Airy had prepared in his annual reports to the Board of Visitors of the Observatory at Greenwich and in his correspondence on private and scientific matters, which he carefully preserved.

ROMFORD AND DISTRICT PHOTOGRAPHIC SOCIETY.—This Society will hold an Exhibition of photographic work in the Public Hall, South-street, Romford, on Thursday and Friday, November 26 and 27, 1896. There are several open classes, particulars of which may be obtained of the Hon. Secretary, Mr. A. John Ormiston, 4, Laurie-square, Romford.

ON Friday afternoon, October 23, Mr. J. F. Joplin, who lived at Ravenscliffe, Sutton Coldfield, met with a dreadful death in the park. He was riding, in company with Mr. E. Butler, near the Blackroot Glade, when his horse bolted, and running under a tree Mr. Joplin came in contact with a bough, which struck him off and killed him instantaneously. Assistance was called, and Dr. Evans summoned to the deceased, but it was found that his neck was broken and his skull smashed in. The body was removed to Ravenscroft to await an inquest. Mr. Joplin, who was well known in the photographic profession, was a partner in the firm of J. W. Beaufort, Birmingham.

THE Hackney Photographic Society's Annual Exhibition will be held at Morley Hall, Triangle, Hackney, on Tuesday, Wednesday, Thursday, and Friday, November 17, 18, 19, and 20, 1896. The Exhibition will be opened on Tuesday, November 13, at 7.30, and on the succeeding days at 12 noon. The Judges in the competitions will be Mr. F. Hollyer, Rev. F. C. Lambert, and Mr. E. J. Wall. Arrangements have been made for high-class concerts, under the direction of Mr. Hensler and Major C. Woolmer-Williams, and an orchestral band under the direction of Mr. Henry Bainton. A demonstration of X rays, *The Heart and Diaphragm in Action*, will be given by Mr. J. E. Greenhill, and also by Dr. Gerard Smith, seeing through hand, arm, and other objects with the naked eye. The cinematoscope (Birt Acres' patent), as shown at Marlborough House, by command of H.R.H. the Prince of Wales, will be exhibited; and, in addition to the foregoing, the competition slides will be shown through the oxyhydrogen lantern by Dr. Roland Smith and Mr. Albert Rose (Lanternist to Society).

THE ACCURATE DETERMINATION OF OXYGEN BY ABSORPTION WITH ALKALINE PYROGALLOL SOLUTION.—It was found repeatedly in my laboratory that during the absorption of oxygen from the Brin gas a considerable volume of carbon monoxide was evolved, although this did not occur in absorbing oxygen from the air. If the evolution of the gas was known to take place, and carbon monoxide was subsequently absorbed by cuprous chloride solution before reading off the residual nitrogen, the estimation of the volume of oxygen was correct; if this precaution was not taken, the estimation was open to serious error. Repeated trials with varying proportions of pyrogallol and potassium hydrate showed that the evolution of carbon monoxide might be entirely prevented by using a sufficiently large excess of potassium hydrate. With the following proportions no fear of this source of error need be felt, even when pure oxygen is being absorbed:—160 grammes of potassium hydrate and 10 grammes of pyrogallol in 200 c.c. of solution. This solution is prepared by dissolving 160 grammes of potassium hydrate in 130 c.c. of water, and then dissolving the 10 grammes of pyrogallol in the alkaline solution.—Professor FRANK CLOWES, D.Sc. (Lond.).

A WORD TO EMPLOYERS.—If you have a good workman, treat him right, pay him a fair price for his services, and let him feel that you regard him as something more than a mere machine for the mechanical production of some particular marketable product. To obtain good work from a machine, says a contemporary, an occasional oiling is necessary. It is the same with man; a bit of praise, a pleasant word, treatment that causes a man to feel that he is a man, all act upon the workman as does oil upon the machine. It costs nothing to treat a man right. No need to be familiar, that will often lose you his respect and lessen your control of him; get his respect by respecting him. The writer knew a man who made a business principle (!) of finding fault with the work, and bulldozing the spirit of his workmen at regular intervals, in order to discourage any attempt at advance, and to stifle any aspirations for better wages. He has failed several times, and is always complaining that his men are loafers. This business principle (?) of his has been the cause of all his trouble; a good man will not work for him. The men he does get go to him from the necessity of having work. They have no encouragement and no spirit to do for him more than is absolutely necessary, and they leave him at the first opportunity for a better master, and yet he thinks that his is the right and only way to treat a workman. The moral is plain: To get the best efforts from a man, you must first of all have his respect, and next his good will. Treat him as a man, and you will have both.

A PHOTOGRAPHIC LIBRARY.—Professor Reginald A. Fessenden, of Pennsylvania, says that it is possible to condense a library of 50,000 volumes into a box of one cubic foot capacity by means of photography. Professor Fessenden has used photography for several years in collecting scientific data, and has found not only this method is cheaper than the cost of paper on which to write the same amount of matter, but also that it occupies only one per cent. of the time required in copying by hand. From the results that he has obtained in this way he thinks that it is not impracticable to reduce a big reference library to a small bulk by the same method. Professor Fessenden says, as an illustration of what might be accomplished by photography, that it would be an extremely easy matter, for instance, to arrange the mechanism of a plate containing a German dictionary so that by the pressure of a couple of keys the page commencing with any given letter could be thrown on the screen. Professor Fessenden says he has overcome the difficulties arising from the necessity of accurate focussing, the expense of the plates, and the time required to put an object into a suitable condition to photograph. A special camera is employed, having a one and-three quarter-inch focus, and a lens of a quarter of an inch aperture. Suppose it is desired to copy a table which occupies a page of a technical journal. The paper is laid on the desk, and the camera, which is small and suspended on a bracket above the desk, is focussed so as to include the page. A plate-holder is then put into the camera and exposed for ten seconds, if the illumination comes from a student lamp of thirty-two candle power, placed on the desk opposite the paper, and one-tenth second if the exposure is by daylight. The plate-holder is then put away until a convenient opportunity occurs for developing. From the instant it is decided to copy an article until the time the operation is finished it need not be more than twenty seconds. When twenty-five or thirty plates are exposed, which may be within a week or so, they are all put in one tray and developed together. As all have made the same exposure, it is not necessary to watch them carefully, and in practice they may all be developed, fixed, and left to wash in ten minutes. The whole time spent in copying one article or table, including preparation for photographing, exposing, developing, fixing, washing, filing away, and labelling is less than one minute, according to the Professor's experience. These negatives may be filed away in small envelopes stuck to the backs of pasteboard cards. These plates used are only one-and-a-quarter inches by one one-and-a-half inches, and can hold upon them 2000 words, so that each word can be easily read with a small magnifying glass. This has the advantage of preserving drawings, which show with equal distinctness and also of preventing errors in copying. In case one does not wish to copy more than 400 or 500 words, this number can be read with ease by any person of average eyesight without the use of a glass. So convenient is this method, that Professor Fessenden states he uses it for copying all his correspondence.

"OPERATORS AND OPERATORS."—The art of photography to-day lies in the conception of an idea," says Abraham Bogardus, "and the lighting, posing, and execution necessary to carry out the conception. The old 'sit down there and keep still' will not answer for this intelligent age. Who gets the honours at our exhibitions and conventions? It is not the man who merely makes a good picture photographically. It is the man who exhibits pictures with the above qualifications, art in conception and execution. There may be occasions when he cannot display the art he may possess. For instance, when a bouncing mother brings a bouncing baby, wishing a group. The photographer may place the mother as gracefully as circumstances will admit, but the young hopeful will not be posed according to the rules of art or any other rules. Young as he is, he has a will of his own. Art don't trouble him. He is determined to slip off from the abundantly ample lap offered him, and, like some windy orators, 'take the floor.' A little force is now necessary. He don't like that. Then some squeezing is resorted to. To this he decidedly objects, and, although unable to raise a cyclone, yet he can, and does, raise a squall. Under the above circumstances, the operator is obliged to suspend all knowledge of art, drawing, or taste for beautiful lines. He is hoping for anything within the lines of propriety. We should not find fault with him or condemn his production. It is one of those unavoidable happenings to which human nature, in the pursuit of bread and butter, is liable. He is burdened with a weight of responsibility difficult to locate and impossible to control, while the financial probability is light and doubtful. In this emergency he is not supplicating for art. Dexterity and snap is the burden of his mind. Before he has had five minutes' rest, or time to gather his ideas, another very different situation presents itself. A beautiful lady, elegantly dressed, requires his attention. Now we shall see how much art there is in him. She is pliable in his hands, and willing to conform to his superior taste. He knows this picture will be subjected to severe criticism. He knows that success means more business, and a favourable recommendation to friends, whose patronage is desirable. At a glance he sees the style of picture which will be favourable, and at once proceeds to carry out his idea. Being a gentleman, he acts with dignity, carefully, promptly placing his subject. The picture must be graceful, and, at the same time, natural and easy. Just consider that sentence. It contains a great deal. Graceful, dignified, agreeable, and pleasing to the eye. Natural; it must conform to reality. Easy; it must not be constrained. If the picture represents the points named, it is a success. The expression will, in most instances, conform to such accompaniments. It is human nature to conform to environments. If your surroundings are pleasant, it shows in the face. Can a person be expected to look pleased when all around is dingy, dismal, and disagreeable? I do not believe in too much talk with sitters. An agreeable conversation as to sitters' wishes, and what you intend to produce, is well, but many sitters are disgusted with the continued 'gab' of shallow-headed pretenders, and rightfully *angry* when the results fail to fulfil *loud* promises."

Patent News.

THE following applications for Patents were made between October 14 and 21, 1896:—

CAMERAS.—No. 22,557. "Improvements in or connected with Photographic Cameras." W. TYLAR.

MAGAZINE CAMERAS.—No. 22,573. "Improvements in Magazine Cameras." S. D. WILLIAMS.

PHOTOGRAPHS IN WATCHES.—No. 22,614. "Improvements in the Inner Covers of Watch-cases to adapt them to receive Photographs." Complete specification. A. SALCHLI, L. KEMPF, and G. ZORFLUH.

SCREEN KINETOSCOPY.—No. 22,627. "Improvements in or relating to Apparatus for, taking Photographic Pictures of Objects in Motion, and for Exhibiting such pictures." H. J. HEINZE.

REPRODUCING PHOTOGRAPHS.—No. 22,732. "An Improved Method of, and Apparatus for, Reprodncing Photographs, Sketches, and the like." N. S. AMSTUTZ.

EXHIBITING PHOTOGRAPHS.—No. 22,928. "Improvements in Apparatus for Taking or for Exhibiting Photographs." Complete specification. W. FRIESE GREENE.

PHOTOGRAPH STAND.—No. 23,013. "A new or Improved Stand for Photographs, and the like." J. W. MARRIOTT.

PHOTOGRAPHING MACHINES.—No. 23,039. "Improvements in Automatic Coin-freed Photographing Machines." A. G. ADAMSON.

ADVERTISING BY PHOTOGRAPHS.—No. 23,059. "Improvements in the Mode of Advertising by means of Photographs and the like." H. STEVENSON.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
2	Bradford	*Economical Enlarging.* F. Nicholson.
2	Camera Club	Smoking Concert.
2	North Middlesex	Trial of Members' Slides.
2	Richmond	Lantern Evening, Members' Slides.
3	Brixton and Clapham	*An Hour with the Lantern Microscope.* R. G. Mason.
3	Gospel Oak	Bromide Printing and Developing.
3	Hackney	Prize Slides.
3	Isle of Thanet	*How to Expose a Photographic Plate.* G. F. Blower.
3	Lewisham	Lantern Evening, Prize Slides.
3	Wolverhampton	*Practical Pictorial Photography.* A. Horsley Hinton.
		Some Hints on the Retouching of Faces. Roland C. Whiting.
4	Borough Polytechnic	Conversational Meeting.
4	Croydon Camera Club	*Photo Ceramics.* P. Elliff.
4	Leeds Camera Club	Annual General Meeting.
4	Photographic Club	Prize Slides.
4	Putney	*Intensification and Reduction.* J. McIntosh.
4	Southport	
5	Camera Club	*Platinum Working.* Rev. J. Beanland, M.A.
5	Leeds Photo. Society	Prize Prints.
5	Leigh	Print Competition.
5	London and Provincial	Social Night.
5	West Surrey	*Lantern-slide Making.* Mr. Hodges.
5	Woodford	*The Highlands of Scotland.* D. J. Neill.
6	Aintree and District	*Reduction and Intensification.* A. Roode.
6	Croydon Microscopical	Prize Slides.
7	Borough Polytechnic	

ROYAL PHOTOGRAPHIC SOCIETY.

OCTOBER 27,—Technical Meeting, Mr. G. Scamell in the chair.

ACETYLENE.

Mr. C. HODDLE (Messrs. Thorn & Hoddle) gave a demonstration of the Incanto acetylene apparatus for portraiture and the optical lantern, dealing, in some preliminary remarks, with the question as to whether acetylene gas was safe in the hands of persons possessing no special knowledge of it. With ordinary care and a fair amount of intelligence, he said it was as safe to manage as an ordinary candle, provided a simple and effective generator was employed; but cylinders of compressed acetylene must be avoided. Acetylene would not stand much pressure, about 700 lbs. bringing it to a liquid, and, if this was exceeded, the machinery must break or the cylinder burst. He attributed the recent explosion in Paris to an attempt to fill a cylinder which was only partially empty, a danger entirely obviated by the use of a generator. The Incanto generator comprised a carbide container, and a gas and water container combined, and, upon charging the apparatus and turning on the stopcock, the gas would be supplied as required, the generation being automatically stopped when the lights were turned out. The generator was connected with the Society's optical lantern, and a number of slides (including Mr. Paul Martin's medalled series, *London by Night*) were projected, a disc of about five feet in diameter being excellently illuminated. The studio lamp, for portraiture, carrying twelve sixty-candle power burners in a parabolic reflector, was also shown, with specimen portraits taken by its means with an exposure of about four seconds. Mr. Hoddle confidently recommended acetylene as an absolutely safe gas to handle, and anticipated an early reduction in the price of calcium carbide as a consequence of the increased demand and the greater output from the works. A perfect burner had not yet been invented, but Bray's 4 O or 5 O were the best now obtainable, the former passing one foot of gas per hour.

The CHAIRMAN asked what the insurance companies had to say about the use of acetylene?

Mr. HODDLE said the companies were very ridiculous in the matter, and were making out that the gas was a great deal more dangerous than was really the case.

Mr. T. BOLAS pointed out that the kinetic position of acetylene was precisely the same as that of dynamite, and it was something with which one should be extremely cautious. As with a weight suspended over one's head, one knew that the danger was present, but did not know what would release the weight.

Mr. FERGUSON had understood that acetylene formed explosive compounds with copper and brass, and asked whether such could be formed with the fittings of apparatus?

Mr. BOLAS strongly deprecated the use of copper or brass in any form for acetylene fittings, although the action did not readily take place with clean metal.

Mr. HODDLE said Mr. Bolas was unnecessarily frightening his audience, and was referring to the gas as it was made twenty-five years ago rather than as it was at the present time. He had purposely tried to get an explosive compound with copper, but had not succeeded.

Mr. CHAPMAN JONES also thought that Mr. Bolas had taken an extreme view of the case. He believed the acetylene compound with brass was very rarely produced, though, doubtless, it sometimes arose by action on corroded metal, but even then the quantity was so very small that, if it were to go off, only a little puff would result. The compound caused by the action of acetylene on brass, &c., was of a fulminating character; but, although he had made the gas and experimented with it for many years, he had never had any sort of explosion, and the risk was so remote that it was practically of no moment.

Dr. OWEN asked whether it was necessary to limit the burners to two, as in the lantern fitting exhibited.

Mr. HODDLE said nothing was gained by increasing the number of burners; more light was obtained, but not much of the light passed through the lens. No smoke arose unless the pressure was insufficient. There was a particular height at which the flame smoked, but this could be remedied at once by turning it either up or down. When full on, no smoke was caused. The pressure at which he was burning the gas was about forty-tenths, coal gas being, in his opinion, usually supplied at about twenty-tenths.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 22,—Mr. J. E. Hodd in the chair.

Mr. E. J. WALL considered it would be well to revive the old custom, which had been allowed to lapse, of formally introducing newly elected members, and he therefore had much pleasure in introducing Mr. G. H. James, who had promised shortly to give them a paper.

The CHAIRMAN announced that, it being an Open Night, the meeting would be devoted to the examination of objects of interest.

Mr. T. E. H. Bullen passed round a number of transparencies done on warm-toned lantern plates, sample packets of which he had brought up for those interested in lantern work for trial. The longer the exposure and the weaker the developer, the warmer was the tone obtained. Those shown were from dense negatives, and received from twenty-five to forty seconds' exposure to a No. 5 gas burner at twelve inches' distance. The plates would yield any degree of softness or density according to requirements.

Mr. EVERITT had been intrusted with a print which had been toned in a recently recommended toning bath containing sulphite of soda. Although left in this bath for two hours, the print still retained its original red colour of an untoned print.

It was generally agreed that the sulphite was in excessive proportion.

Mr. DRAGE said the least over-use of sulphite would stop toning altogether, and it was a thing which should be very cautiously used.

Mr. Bayston exhibited a print from a pocket Kodak negative, taken the previous night by moonlight with an exposure of an hour and a half.

The CHAIRMAN described a pocket camera, which did away with rollable films, dark slides being provided. It was fitted with finders, and time and instantaneous shutter. Glass plates could be used, and were of one-quarter the size of quarter-plates, to facilitate the cutting of which he showed a device so made that the diamond ran in fixed slots, and accurately divided the plate into four. He handed round an enlargement of one of the negatives by sixteen diameters. He also exhibited a new pneumatic flash lamp of high power, and an old photograph, done twenty-five years ago, very well preserved, and the process used in making which he wished to learn.

Mr. BANKS thought it looked like a collodion transfer.

Mr. H. Snowden Ward handed in an enamelled tile on which a photograph had been reproduced and burnt in. It was produced by a photo-mechanical, and not a pure photographic, process, by Mr. Grundy, of Derby, who had utilised the collotype process, the necessary depth of shadow being obtained by five or more separate printings on the same tile immediately after and on top of one another. This required very nice adjustment to ensure accurate register. After printing, it is glazed and fired in the usual way. The depth of shadow was all that could be desired, and the process allowed of any of the ceramic colours being used. They were being supplied on very reasonable terms, and were designed to compete with German-made goods.

A discussion ensued as to the necessity for very accurate register in the separate printings, Mr. EVERITT having discovered slight defects with the aid of a glass. He thought the use of glazed surfaces was to show to more advantage the finest detail, the preservation of which he thought a great thing.

Mr. JAMES said tiles were not to be confused with enamels of the usual type. They were purely decorative, and should be as "broad" as possible, with very little detail.

Mr. SNOWDEN WARD said the glaze was to facilitate cleansing; but, if preferred, it was possible to have a matt glaze, which would display as much detail as the glazed, but without the reflecting surface. It was liable, however, to retain dirt, which was not the case with a glazed enamel.

A desultory discussion followed upon the previous week's proceedings regarding the tanning action of pyro and bromine on gelatine, consisting of the most part of repetitions and restatements of opinions before given.

PHOTOGRAPHIC CLUB.

OCTOBER 21,—Mr. Crofton in the chair.

Mr. J. R. Williams passed round two old enlargements as objects of interest, one a carbon enlargement of a photograph of Bruges, made by the late Walter Woodbury, the other a portrait of the Prince of Wales, enlarged and printed on salted paper by Mr. Alfred Harman.

The CHAIRMAN read a letter from Messrs. Cadett & Neall, in which they stated they had sent samples of lantern plates for distribution among the members, and a copy of their new photographic instruction book for the Club library.

In view of the annual general meeting, fixed to take place a fortnight hence, the nominations of the several officers of the Club for the ensuing year were made.

Notice was given by Mr. Fry of a motion to enable the Committee to suspend the holding of the meetings during the summer months if the Committee thought it in the interests of the Club to do so.

Mr. F. YORK presented to the museum an old instantaneous shutter for a pair of lenses. This had been made for him thirty-five years ago.

Mr. Frank Haes passed through the lantern a few slides from negatives made by himself from objects collected by Professor W. M. Flinders Petrie at Thebes. These were of great interest on account, first, of the great age of the objects themselves; and, secondly, on account of their character. The most interesting comprised examples of iron tools dating from about 670 B.C., and

consisted of files, rasps, chisels, &c., of striking resemblance to the most modern instruments. Mr. Haes also showed copies of mural paintings illustraiting the art of a time some 3000 years B.C.

Borough Polytechnic Photographic Society.—October 21, ordinary meeting, Mr. A. Bedding (Chairman) presiding.—Mr. P. C. CORNFORD read a paper by Mr. Thomas Bolas on

THE INTENSIFICATION AND REDUCTION OF NEGATIVES,

which dealt chiefly with intensification by the mercuric chloride, ammonia, and potassium iodide method, and reduction by Howard Farmer's well-tried system of hypo and ferricyanide of potassium. Several slides were shown, illustrating the writer's remarks.

Brixton and Clapham Camera Club.—The opening meeting of the winter session was held Tuesday, October 20, Mr. J. W. Coade (President) in the chair.—There was a very large attendance of members to hear Mr. HORSLEY HINTON (Vice-President) read a paper on

PRACTICAL PICTORIAL PHOTOGRAPHY.

In his introduction Mr. Hinton said photography has numerous ramifications, of which pictorial photography is only one branch among many others. Our Exhibitions, however, bear evidence of the attention it is receiving at the present time, and an ever-increasing body of workers are devoting time and energy to its pursuit. As an amusement, photography can easily be beaten. Carrying heavy weights for hours along dusty roads, at the end footsore and weary, waiting with patience an hour or more to secure the photograph, afterwards subjecting oneself to a voluntary imprisonment, trying alike to eyesight, health, and temper—the imprisonment of the dark room—is certainly not sufficient reward to tempt one to take up photography as a pure amusement. What, then, is the inducement? It is the hope that in the after-results will be the recompense for the labour spent. These expectations, alas! often end in bitter disappointment. Entering into his subject, Mr. Hinton gave a complete and masterly exposition of the meaning of pictorial photography and its difference from "the usual thing." Illustrating his remarks with diagrams, lantern slides, and prints, he explained clearly the essentials of a true picture, and the principles necessary to successful picture-making by photography. His address received the closest attention, and must have made a deep impression on his hearers. Much was given to think over, and many must have gained knowledge which will confer upon them the power to work with more success in the attempt to portray the pictorial possibilities of photography. Unfortunately, time permitted of no discussion, desirable as it would have been, Mr. E. Dockree in particular being anxious to obtain Mr. Hinton's reasons for a statement he made respecting the merits of lantern slides as pictures. The recent Exhibition, it was mentioned, has been an unprecedented success, both as regards the quality of work shown and the support given by the public. Ten new members were nominated.

Croydon Camera Club. — The usual Wednesday evening meeting, on October, 21 was devoted to

AT HOME PHOTOGRAPHY,

which was expounded by means of a lantern lecture composed by Mr. W. Thomas, F.R.P.S. The lecture was one upon which amateur was written large, both matter and manner being of the unprofessional order. Unfortunately, Mr. Thomas was unable to attend and read his paper, as had been hoped, hence the duty devolved upon the PRESIDENT (Mr. Hector Maclean), who gave it with a vivacity which at times seemed to be much appreciated by a large gathering of members. The lantern slides in illustration were skilfully projected on to the screen by means of a newly acquired biunial lantern, which was in charge of Mr. Isaac. At the termination of the reading, Mr. Maclean stated he trusted members had received gratification and instruction from what had gone before, and that they were not like the beadle depicted in to-day's *Sketch*, who told the "meenister" that he disliked the good man's "sairmon" for three reasons. "Fairstly, ye read it; secondly, ye did n'a read it weel; and, thirdly, it wasna' worth readin'." He (the speaker) felt sure that, at any rate, Mr. Thomas's paper was worth careful attention, for more than one reason. At the same time, exception must be taken to a good deal of what had been rather too dogmatically brought forward in the lecture on the subject of composition. Mr. Maclean at some length analysed what were the points alluded to. He also questioned the exposure advised for a figure taken in the most brilliant sunlight possible with stop *f*-11, six seconds being correct. An interesting discussion followed, in which Messrs. Wratten, Kough, Richardson, and Ibbetson took major part. The PRESIDENT announced that Mr. Edwin Dockree had accepted the Club's invitation to show and describe a choice selection of his slides at the first public lantern show. Prints of varied interest were shown by Messrs. Maclean, Rogers, Isaac, Noaks, and Kough, the last-named exhibiting a remarkable snap-shot depicting a man shooting a wild duck, the latter being seen falling in mid air. Amongst the other prints were some amusing and clever flashlight photographs taken by Messrs. Noaks and Isaac at the Dolphin costume swimming entertainment. A few lantern slides by members were put on the screen, including a set of Dorking scenes by Mr. Elkin, and a fine series of interior and exterior views of the Municipal Buildings by Mr. Jenkins.

Hackney Photographic Society.—On October 20, Mr. J. O. Grant in the chair, the HONORARY SECRETARY announced particulars of the forthcoming Exhibition. Members' work was shown by Messrs. Dunkley and Hensler. Mr. Fleetwood showed results of his experiments with the X rays. Exposures had been made through various thicknesses of opaque material with excellent results. In the absence of the writer, Mr. A. MACKIE read a paper on

INTENSIFICATION AND REDUCTION,

by Mr. E. J. Wall. The paper dealt most thoroughly with the different methods, commencing with the advice that a print should be taken from the negative before intensifying or reducing, as it was difficult to judge of the printing density without trial. In the discussion which followed the reading of the paper, the CHAIRMAN said that, when dealing with a too thin negative, if time were no object, it was a good plan to make a positive transparency from it, and another negative of the required density from that. This plan had the further advantage of not interfering with the original negative, which might possibly be of correct density for enlarging from, but not for printing direct.

North Middlesex Photographic Society.—October 26, Mr. C. Beadle in the chair. Messrs. Bacton & Hambly were duly elected members of the Society. The President (Mr. Mummery) called attention to the special competition, Outdoor Figure Study, the prints for which are due next Monday, November 2, also the annual Exhibition to be held on November 30, and December 1 and 2. Mr. J. A. SINCLAIR then proceeded with his demonstration on the Artigue system of

CARBON PRINTING WITHOUT TRANSFER.

He said it was really the oldest form of carbon printing, slightly modified. He went very fully into the method of sensitising and using the paper, and laid special stress upon the fact that it was essential to keep the temperature of the sensitising bath below 60° Fahr., and also the paper in drying. He developed a couple of prints which turned out successful. Under-exposure, he said, gave a flat grey image, and over-exposure too dense blacks, with too white high lights. The time of sensitising, and the strength of the sensitising solution had a good deal to do with the quickness in printing and the gradation. The paper darkens considerably on drying, and it was necessary to allow for this in development. After washing, the print should be put into an alum bath. A vote of thanks to the lecturer concluded the meeting.

Putney Photographic Society.—October 12, Dr. W. J. Sheppard in the chair.—On this occasion a set of architectural slides, ecclesiastical and domestic, was shown. These included examples of Saxon, Norman, Early English, Decorated, and Perpendicular styles of architecture in this country now existing, which illustrated, in an interesting and instructive manner, the gradual transition of each style into the succeeding one. Among the slides shown were several very beautiful views of cathedral interiors.

OCTOBER 22, Dr. C. Wyman in the chair. A lecture, by Mr. Chapman Jones, on

NEGATIVE-MAKING,

was read by the Chairman to a large audience. The paper proved to be a very valuable one, containing much information on exposure and development, and was greatly appreciated by those present. Some of the members expressed the hope that the paper will be published on the completion of its rounds among the societies, in order that they may have an opportunity of studying it at their leisure. After a short discussion, a hearty vote of thanks was accorded to Mr. Jones for his interesting paper. Owing to the increase in the secretarial duties, the Council have elected Mr. W. J. Colebrook to be Joint Hon. Secretary with Mr. William Martin, who has for some time carried on the duties of Hon. Secretary and Treasurer.

Woolwich Photographic Society.—October 21.—The Rev. F. C. LAMBERT, M.A., began the first of a series of three lectures on

ART PHOTOGRAPHY.

beginning with (1) The General Nature of Pictorial Composition; (2) Selection and Arrangement, with special reference to Lines, Forms, and Mass. Mr. Lambert very ably described his lecture by means of sketches on the board, and, by the help of the lantern, he showed some of Turner's and other artists' work, which he described with reference to their pictorial and other qualities. The meeting was very well attended, and, judging by the applause given to Mr. Lambert after his lecture, was well appreciated. Mr. W. H. Dawson kindly acted as lanternist.

Leigh Photographic Society.—October 22, Mr. S. L. Syms presided.—A discussion, introduced by Mr. W. HAMPSON, on the development of special rapid plates and dark-room illumination, proved of great interest, and was enthusiastically taken up by the members; and Mr. Hampson exhibited some splendid negatives on these plates, which were everything to be desired. The Country Village Competition was held, and Mr. Herbert Isherwood took off the first prize, presented by Mr. W. Hampson, who gained the second prize. Messrs. P. Seddon, W. R. Moore, T. Haddock, and Dr. Joseph Jones were the unsuccessful exhibitors.

Liverpool Amateur Photographic Association.—October 22.—Mr. GEORGE HOLDING, of Liscard, gave a paper and demonstration on the

ART OF SCULPTURE,

doing a lightning model of Mr. Gladstone's head in clay, and afterwards taking a cast of the hand of Mr. William Tomkinson, one of the members. The demonstration was a departure from the beaten track of the Society, and constituted an agreeable change, which seemed to be much appreciated by a large audience.

Photographic Society of Ireland.—October 23, the President (Mr. Alfred Werner) in the chair.—Mr. R. M. INGLIS gave a practical demonstration on

ENLARGING.

During the evening the lecturer described and showed his enlarging lantern, and how it was possible to adapt his ordinary camera as a front for holding the negative, and, of course, the lens. He used the incandescent gas light, which was very steady and bright, and always exposed his enlargements through an aperture of *f*-24. He preferred using developers such as metol or amidol to the ferrous oxalate, as he thought it was possible to obtain by their use softer images, with less harsh blacks in the shadows, than when the iron developer was employed. Mr. Inglis's lecture was interesting and instructive, and delighted the audience, which comprised about seventy members and their friends. Several questions put by members to the lecturer were thoroughly dealt with. Afterwards Mr. L. R. Strangeways (Vice-President) showed the Autocopyist, which proved of interest to a large number present. Mr. W. O. Stanley was elected a member.

Port Elizabeth Photographic Society.—Annual General Meeting.—The following are extracts from the annual report:—The meetings held during the session are 20, and the average attendance 15, the largest number at any one meeting being 25. Your membership roll began the session with 52 members. To this was added during the year 20 new members, making a total of 72. Out of this number 9 have become country members, but still take an interest in the doings of the Society, while 8 have resigned. This makes the roll 55 active members, with 9 country members. The Treasurer's balance-sheet shows a substantial credit balance. The annual outing in October, 1895, took place at Springfield, a few miles beyond Uitenhage. Although the scenery was not adapted for taking a variety of photographic views, still some good prints were produced, and all who took part in the outing, whether naturalists or photographers, came back looking all the better for their trip. The ride by bullock waggon from Uitenhage formed a pleasant break in the journey. A field day at Cuyler Manor, fifteen miles from Port Elizabeth, was also arranged by the members, where some excellent photographs were taken. Mr. Davies was very successful with a photograph of some ostriches near to the dam at the farm house, which made a very pretty picture. This photograph was, much to his surprise, reproduced as a half-tone block by the weekly illustrated paper, *Black and White*, shortly after, under the misleading title of *Ostrich Farming in the Transvaal*. This fact your Committee wish to bring before your notice as a warning to members not to indiscriminately give away prints. In February, 1896, the Society inaugurated a new departure in lantern lighting. In place of the usual four-inch paraffin lamp, there was adapted to the lantern one of Welsbach's incandescent mantles with gas mountings. This light was found to give a clearer light than the paraffin, and better definition of objects. Lantern slides which, with the ordinary oil lamp, looked smoky, came out on the screen under the incandescent lamp clear and distinct. Our relations with other societies in South Africa continue to be of the most friendly nature. During the year competitions have been judged by both Kimberley and Capetown societies. Your Committee, with deep regret, have to record in this report the sad death of Mr. Norman Edwards, aged nineteen, the youngest member of the Society, who was brutally murdered by the Matabeles a short time since. He was well known to many of you here this evening, as it is not so long ago that he was personally amongst you all, a promising young member doing capital work in the Society. To his parents the Committee expressed their sympathy for the sad loss they had sustained immediately after the news became known to them. The CHAIRMAN, in moving the adoption of the report, congratulated the members upon the flourishing condition of the Society, not only in having good workers and energetic members, but in having financially such a substantial balance to the good. He doubted if many similar societies were upon such a sound basis. He noticed that a good number of members had gone to other towns, but he did not consider that as altogether against the Society, for they could undoubtedly speak in such good terms of it as to induce other young men coming to the town to join. He wished to state that a full set of apparatus for the production of Röntgen's rays was now in his hands, and this he placed at the full disposal of the Society for the purpose of their making an exhibition of this wonderful discovery. He hoped that, now the Athenæum was completed, it would become a home to the young men of the town, a place where instructive and scientific pursuits could be developed and maintained. He therefore moved the adoption of the report, which was seconded by Mr. RICHARDSON. Mr. ALCOCK proposed, seconded by Mr. FORREST, a very hearty vote of thanks to their President for the unceasing interest he had taken in arranging the affairs of the Athenæum. What he had done was beyond a duty, it had become more a personal matter with him, and members must feel grateful for his energy and perseverance. This was carried with acclamation, all members rising to their feet. The election of office-bearers resulted as follows:—*President:* Mr. A. Walsh.—*Chairman:* Mr. W. Alcock.—*Vice-Chairman:* Mr. F. West.—*Committee:* Messrs. Jackson, Mathews, Richardson, and Scruton.—*Hon. Treasurer:* Mr. J. Lewis.—*Hon. Secretary:* Mr. W. A. Brown.

FORTHCOMING EXHIBITIONS.

1896.	
Oct. 30, 31	Southport Social Photographic Club.
,, 30-Nov. 7	Photographic Salon, Dudley Gallery, Piccadilly. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 30–Nov. 12	Royal Photographic Society. R. Child Bayley, 12, Hanover-square.
Nov. 12	Dulwich Photographic Society.
,, 17-20	Hackney Photographic Society. W. F. Fenton-Jones, 12, King Edward Road, Hackney.
,, 26, 27	Romford and District Photographic Society. A. John Ormiston, 4, Laurie-square, Romford.
,, 30–Dec. 1, 2 ...	North Middlesex Photographic Society.
December 3, 4.....	Aintree Photographic Society. E. P. Heron, 2 Tilney-street, Orrell Park, Aintree, Liverpool.
,, 28–31.....	Borough Polytechnic Photographic Society. P. C. Cornford, 103, Borough-road, S.E.
Dec. 1896–Jan. 1897	Bristol International. Hon. Secretary, 20, Berkeley-square, Clifton, Bristol.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE ARTIGUE PROCESS.

To the EDITORS.

NTLEMEN,—The enclosed price list of M. Victor Artigue will perhaps help you in your promised answer to "Alum Hypo." It was given me by M. Artigue when I visited him about a fortnight ago at his factory in Bordeaux, where he was kind enough to demonstrate the printing and development of the paper to me. The results of the process are of extraordinary beauty. The maximum of contrast is obtained without a suspicion of hardness. In a reproduction of a well-known oil painting, *La Main Chaude*, by Roybet, the high lights stand out with wonderful vividness, though there is not a spot without gradation. M. Artigue explained that this brilliance is due to the slightly satined surface of the paper. The sharpness of detail is remarkable. In a small reproduction of an old woodcut illustrating *L'Ecole des Maris* every touch of the graver's tool is perfect.

The preparation of the paper and the sawdust is M. Artigue's secret. All the materials can be sent by parcel post, where the Postal Convention extends. It is not easy to send small quantities by sample post, as such parcels must be packed so as to be easily opened for inspection by the authorities, and the paper, though non-sensitised, may receive damage.

M. Artigue's address is 114, rue Terre-nègre, Bordeaux.

I may say that the development is practically identical with the directions given in the last paragraph of Mr. Pretzl's article of last week, except that, instead of being laid on glass, the paper is clipped to a strip of wood. Great modifications can be obtained by varying the temperature of the water, and the quantity and fineness of sawdust in suspension, by taking from the top or bottom of the container.

If you would care to see the specimens given me by M. Artigue, I shall be happy to send them for your inspection.—I am, yours, &c.,

St. Mary's, Poole, October 23, 1896. AUGUSTIN MORFORD.

[We are much obliged to our correspondent for his letter and enclosure. There are excellent specimens of the process in the Exhibitions of the Royal Photographic Society and the Salon.—EDS.]

UNFAIR COMPETITION.

To the EDITORS.

GENTLEMEN,—Will you allow me space to call attention to the latest dodge to increase the circulation of a halfpenny London morning paper. Not content with cigarettes, bicycles, and jumble puzzles, the journal in question is now in a position to supply, to the first 1000 of its readers, "a beautiful three-quarter life-size crayon and ink portrait," for the unheard-of sum of six shillings and sixpence. Should the reader order one from the "poor photographer," the usual price will be from two to four guineas. This is in no sense a case of fair competition, but sheer, underselling, and tends to depress the wages of the photographic workers to starvation point, for at the present time, with the trade in such a depressed condition, photographers have quite enough competition to meet without this halfpenny journal making matters worse. Thanks to this paper and the well-known firm of diarists of whom we have heard so much lately in the columns of THE BRITISH JOURNAL OF PHOTOGRAPHY, photographers will soon have to put up their shutters and retire to the workhouse. I am sure that, when a London daily enters into competition without side trades, it must in some way "feel the pinch." Let us hope we shall never see the good old BRITISH JOURNAL OF PHOTOGRAPHY retailing soap and flea powder.—I am, yours, &c., VICTOR THOMAS.

11, *Munster-road, Fulham, S.W. October* 20, 1896.

THE CARRIAGE OF GAS CYLINDERS.

To the EDITORS.

GENTLEMEN,—The lantern season has arrived, and we are face to face again with the (to my mind) senseless restrictions *re* carriage of cylinders. One would have thought, after the Board of Trade report, that we should have been allowed to carry them as passenger's luggage, provided they were properly packed in either boxes or other covers. The railway companies are evidently not disposed to take off the restrictions, and, if anything is to be done, *we* as lanternists, both professional and amateur, must move in the matter. Cannot we unitedly petition or memorialise the railway companies? The commercial travellers have got special facilities of a most beneficial kind by *united application*, and I think we might do something in the matter instead of merely grumbling and paying. To one who travels 15,000 to 16,000 miles each winter with the lantern, as I do, cylinder carriage is a serious item.—I am, yours, &c., JAMES W. GARBUTT,

Lanternist to the Gilchrist Lectures.

Armley, Leeds, October 19, 1896.

AN INDEX TO SCIENTIFIC PERIODICALS.

To the EDITORS.

GENTLEMEN,—The *Catalogue of Scientific Papers*, compiled and published by the Royal Society of London, was intended to serve as an index to the titles and dates of scientific papers contained in the transactions of

sccieties, journals, and other periodical works. This Catalogue is highly valuable to all technical inquirers, and it is a matter of deep regret that the International Conference, held under the auspices of the Royal Society of London, has decided that the *International Catalogue of Scientific Literature*, which is to begin with 1900, is to relate to pure science only, applied science being strictly excluded. It is possibly too late to remedy the position, which is probably due to the absence of representatives of technical societies at the International Conference.

It would seem desirable, further, that there should be a conference of technical societies to discuss the publication of a subject-matter index to technical and scientific periodicals. This institution has had for some time before it the question of the publication of such an index of subjects of interest to mining and metallurgical engineers; and probably a comprehensive index to engineering and other technical papers would prove more valuable.

This suggested Conference of Technical Societies might also consider other questions which interest technical societies individually, but which they are unable to obtain owing to want of concerted action. Thus, such an association might approach the Government on such questions as the excessive cost of postage of transactions, as there can be no valid reason why they should not be placed in the same position—although their transactions are issued at varying intervals of time—by a short Act of Parliament as an ordinary weekly newspaper.

And there are many other matters which, no doubt, crop up in connexion with the carrying out of the objects of individual societies in which concerted action would produce valuable results.—I am, yours, &c.,

W. Walton Brown, *Secretary.*

The Federated Institution of Mining Engineers, Neville Hall, Newcastle-on-Tyne, October 21, 1896.

THE PHOTOGRAPHIC SALON.

To the Editors.

Gentlemen,—In your issue of the week before last there appeared a letter from Mr. Charles Moss in defence of an attack that had been made on the management of the Salon.

While appreciating Mr. Moss's good intention, it is necessary to say that no Exhibition can be carried on strictly on the lines he infers. It is true, as he says, that all works are submitted to a committee of those best qualified to judge pictorial photography; but, were it thought that the simple merit of the picture was the only consideration, I am afraid that those responsible would have some very awkward questions to answer, and their ability might at times be seriously questioned.

It should be obvious to all that there must be a certain number of individuals—really there are only a few—who have to be treated apart from the strict merit of their works. Some there are whose services to photographic art have been invaluable in the past, but who cannot keep pace with the advancing ideas of the day; some whose labours on our behalf we could ill afford to spare; and some who, from their position in the world, must be studied. A glance round the walls of the present Exhibition, the finest collection of works of pictorial photography yet brought together, will convince any one of intelligence that these slight deviations from the strict rule affect its excellence to only an inappreciable degree.

I hope Mr. Oliver, to whose letter Mr. Moss replies, will not take his rejection to heart. We sometimes have to reject better pictures than some we accept. Notoriously there is a certain amount of luck in the matter, and the most honest selecting committee can make mistakes, and grievous ones. Let him forget his disappointment, and try his luck again.—I am, yours, &c.,

M. L. R.

To the Editors.

Gentlemen,—As one of the Linked Ring, allow me to say that I hardly agree with the criticisms that "Cosmos," in your last number, passes on what he terms the "attitudinisations" of some of those with whom I share membership, although it has before now struck me as strange that, when a few men ally themselves together in the Cause of Art, they usually take up a position of superiority to those who are intellectually below them. Why is this, sir? The Linked Ring and the Photographic Salon serve a Noble Cause. Generations yet unborn will bless them for their efforts in the advancement of Pictorial Photography to a place among the arts. They must be—nay, I know they are—conscious of this, so why should they sully their dignity by looking down upon a worthy but inoffensive institution, such as the Photographic Society undoubtedly is, and whose only fault is that it so strenuously carries out the terms of its charter that it can afford to ignore both the artistic and scientific sides of photography? I beg my fellow-members of the Linked Ring to desist from these uncharitable attacks upon the Royal Photographic Society. The Royal and Ancient Order of Buffaloes, the Foresters, and the Oddfellows, with their grotesque rites, regalia, and other paraphernalia, may excite the derision of a few members of the community who have no need of them, but is it not conceivable that to others, especially of the industrial class, such institutions may have their uses? I enclose my card, but I ask you to let me sign myself—

Yours, &c., A New Link.

To the Editors.

Gentlemen,—Some months ago, when you published a paper on photographic art that criticised the Salon and its adherents, "Cosmos" twitted the author with giving the Linked Ring's Exhibition a cheap advertisement. It occurs to me that this is just the effect which your contributor's gentle references to the Salon and its members, that appears in your last issue, will have—much against the design, I am sure, of so consistent an opponent of the Salon as "Cosmos" has all along shown himself to be. As one who agrees in the main with "Cosmos" that the Salon does not monopolise exhibited pictorial photography; that it is distinctly a rival show to that of our own Society (the Royal Photographic Society); and that personal pique and vanity are at the bottom of the actions and utterances of those members of the Linked Ring who are warmest in their praise of the Salon, and loudest in their unfavourable criticisms of the Royal and its Exhibition; may I suggest to your contributor the wisdom of, in future, leaving the Links and their doings severely alone? I don't suppose your contributor and others will at first appreciate this advice, the more especially as silent indifference would not by any means be relished by the Salon "young men," whom to attack is to exalt in their own estimation and to advertise to the photographic world generally; but "Cosmos" will at least agree with me, I trust, that the notice he and others take of the Salon is calculated to give it a prominence it does not deserve. That being so, why not, as the Americans say, "let it rip?"—I am, yours, &c., A Royalist.

London, October 26, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries, must be addressed to* "The Editors, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street. Covent Garden, London.*

Photographs Registered:—

William Bond, 53, London-street, Norwich.—*Photograph of four-in-hand team, with passengers.*

A. G. Lewis, 62, Shaw-heath, Stockport.—*Photograph of Stockport County Association Football Club.*

Alexander McHarrie, County Studio, Stranraer, N.B.—*Photograph of Sammy Tamson, holding his gun.*

John Munro, Dingwall, Ross-shire, N B.—*Photograph of herd of deer taken at bors of Ben Wyvis, in February*, 1895.

J. Blain Scott, 18-22, Devonshire-street, Carlisle.—24×18 *direct negative of Sir Thomas Grainger Stewart, of Edinburgh. Photograph of C. P. Colnaghi, Esq., of London.*

Received.—F. H. Evans; J. Lewis; Wallace Bennetto; L. E. Morris; Toning; Magic Lantern. In our next.

F. W. Robinson; W. Rutledge. We will communicate as desired.

A. C. Wright.—We have a vague recollection of the substance you mean. By next week we will endeavour to obtain the information you require.

Light for Lantern.—T. Fisher. We know of no kind of light, whether paraffin or gas, that will equal the lime light as a lantern illuminant.

Cambricus.—We do not reply to questions sent anonymously. If you care to give your name and address, or call upon us, we shall be happy to advise you.

Coating Machines for Dry Plates.—R. W. We are not quite sure as to whether Mr. Cadett still supplies coating machines. Why not write to him and ask the question?

Lens.—H. Watson. If the combination is symmetrical, it matters not which lens is used as a single lens, but, whichever is used, its convex surface should be next the focussing screen.

Interior.—A. Bayant. The fault is in the negative. It is frightfully underexposed. Instead of three minutes, such a dark interior, with the plates used, would require half an hour at least with the stop employed.

Acetylene.—W. Symonds. The acetylene light at present will not compete with the lime light in the lantern. It, however, will compete well with the best of the oil lamps. For a twenty-feet screen we should recommend the lime light, certainly.

Portrait Lens.—W. Foley.—One of the great faults of the Petzval portrait lens is astigmatism. If it could be got rid of, that would be the best form of lens of all, for extremely rapid work, by reason of its large angular aperture, which is not surpassed by any other lens.

ZAENSDORF SELF-BINDING ALBUM.—W. TURNER. We are not quite sure if this album is still in the market. Fallowfield used to be the agent. Write to him.

BLISTERS ON GELATINE PAPER.—W. S. J. We cannot understand that brand of paper blistering; it has never done so in our hands. Possibly you have made some departure from the ordinary method of working? From your letter we can form no idea of the source of the trouble, as it gives no details.

COPYRIGHT.—C. W. It by no means follows, as has been pointed out many times before, that by joining the Photographers' Copyright Union you must take half a guinea for the use of your photographs. You simply agree not to take less than that amount. You can take as much more as you can get; there is no limit in this direction.

COST OF LENS.—W. POOLEY. It does not follow that, because a lens is sold for a small price, it many not be good. Sometimes a low-priced lens turns out to be a good photographic tool; but, of course, many don't. By buying of a good maker you ensure a good instrument, and, as you are a novice, that is what we advise you to do.

DRYING BOX FOR COLLOTYPE.—BEGINNER. Gas may be used for heating the box, but care must be taken that the products of combustion do not gain access to the plates, as they have an insolubilising action on bichromated gelatine. Instead of gas we should recommend you to have one or two paraffin stoves. The fumes from them will be inert.

G. PRESTON.—1. We have no experience of the developer referred to, but we should imagine that the crystallisation out was due to the fact that you had dissolved too much of the salts. Why not dissolve them in the cold? 2. Nothing is simpler than intensification with mercuric chloride, followed by blackening with either ammonia or sulphite of soda.

FACTORY ACTS.—AN ANXIOUS INQUIRER. Photographic establishments certainly come within the Factory Acts, just the same as all other businesses. The Inspector under the Factory Acts in your district will furnish you with all particulars, or you can obtain the rules, &c., from the Office of Factory Inspectors, London, S.W., by writing for them.

PHOTOGRAPHING CHURCH.—Yes; the rector can forbid your photographing the interior of the church; but he cannot do so with the outside, unless, perhaps, if the camera is placed in the churchyard, and there is not a public way through it. If the camera is placed outside the church property, the rector has no power to prevent the photographs being taken.

STUDIO LIGHTING.—C. GREY. As the stippling was only put on the glass to stop out the midsummer sun at mid-day, an advantage would certainly accrue from clearing it off now, and applying it again next year. Moreover, it is more than probable that the paint has acquired a yellow and non-actinic tint by the exposure, and therefore stops off more light (actinic) than is apparent to the eye.

PHOTOGRAVURE.—COPPERPLATE says: "You would greatly oblige me by informing me which is the best book published on photogravure, together with price and publisher."—In reply: The best book on photogravure is that by Mr. Herbert Denison, himself a master of the process. The book is published by Messrs. Iliffe & Son, St. Bride-street, E.C.; price, we think, 5*s.* or 3*s.* 6*d.*

CLEANING OFF OLD NEGATIVES.—PICKWICK. Soak the negatives for a day or two in cold water, and then put them, one by one, into hot. The gelatine will then dissolve off freely. With some plates, after a day or two's soaking, if the film be loosened from the edges of the glass, it can be rolled off in one piece, then the glass will be left clean for future use. No maker will purchase the plates for recoating.

OLD MANUSCRIPTS.—W. SMALL. There is no special treatment that you can apply to the manuscripts, or, if there were, the owner would not allow you to apply it to valuable and irreplaceable documents. If the parchment is thin, it is sometimes advantageous to back it up with white paper before copying. If it is yellow in colour, it will be advisable to employ plates sensitised to the yellow rays, such as those prepared with cosine.

RESIDUES.—R. & CO. The old developing solution is certainly not worth saving, notwithstanding the large number of plates developed daily. There is no silver in it to recover. The case is quite different with wet-collodion plates. That was well worth saving, as it contained a good quantity of silver. You have been doing wrongly by adding the developer to the chloride of silver residues, because the ammonia in it is a solvent of chloride of silver.

COLOURING IN OILS.—B. W. writes: "1. Kindly give me your opinion as to the best way to prepare photographs (albumen prints) for painting in oils. I have seen them mounted on wood, and sometimes on millboard, but do not know how to prepare them. 2. Would you be prepared to criticise my pictures as regards posing and lighting, and general effect, if I send some?"—In reply: 1. Albumen prints require no preparation for colouring in oils. They can be mounted on wood panels or millboard, or anything else. The material on which the prints are mounted makes no difference in the colouring. 2. We shall be pleased to give our opinion on the pictures.

THE "UNITED" LENS. B. B. C. says: "Having recently bought a lens (half-plate) will you kindly let me know, first, if you ever heard of, or saw, Marion's United R. R. lens; the one I bought is engraved as above, but I never saw any advertisement of such a lens; any information you could give me of its qualities and price will oblige. Second, who supplies apparatus for underground photography, that is, the lighting outfit?"—In reply: 1, The lens mentioned figures in Messrs. Marion's catalogue. A simple test or two with the camera will tell you what are its qualities. 2. Messrs. Marion & Co.; Perken, Son, & Rayment, and numerous other firms, supply apparatus for magnesium flashlight work.

THE KEW CERTIFICATES.—L. G. P. says: "I am desirous of obtaining Kew certificates for two or three lenses. Would you kindly tell me to whom they should be sent and with what fee?"—In reply: Address the Superintendent of the Observatory at Kew. We think, but are not sure, that the fee is 2*s.* 6*d.* per lens. If you are interested in the method employed at Kew, you will find in our volume for 1892 an exhaustive paper on the subject by Major Leonard Dawson.

ACTINIC FOCUS.—A. PAGE. If as sharp an enlargement is not obtained as is shown on the cardboard upon which the image is focussed, it is due to the optical and chemical foci of the objective not being coincident. That is the case with many objectives made expressly for the lantern: indeed, for projection purposes, better results are secured when the foci are not coincident. Substitute for the lens with which the lantern is fitted a photographic lens, such as an ordinary *carte* or a quarter-plate lens.

SALARY.—W. J. C. writes: "I have just bought a business. My predecessor paid the lady in the reception-room (who has been in the business since it was opened) 25*s.* a week and a commission, which brings it up to about 27*s.* Is this not an exorbitant salary? I may mention that she keeps the books, and generally manages the business in my absence. She says she will not take less."—We should say she would not. As she has had the management of the business for so many years, we should say that she is under, rather than over, paid.

SILVER IN PAPER.—T. H. H. asks how much silver is consumed in sensitising a sheet of albumenised paper?—This is a question, as it is put, that it is impossible to answer, as the quantity depends upon several things. For example, the larger the proportion of chloride in the albumen the more will be the silver required for its conversion. Again, the more viscous the albumen used, the more will be the chloride in it. Further, as there is always a quantity of solution remaining on the paper, the stronger that is, the greater will be the silver on and in the paper, &c.

TONING.—E. J. H. says he "would like to know, through your columns, the cause of sulphur toning, as some of my silver—albumen paper—prints, after staying in toning bath for about ten minutes, get what I call sulphur toned, the tone being of a bricky red, although paper has had silver washed well out of it before toning. Acetate bath is used."—If the ordinary acetate toning bath is used, there will be no sulphur toning of the prints. Our correspondent is in error when he says there is sulphur toning, that is, of course, supposing that the usual acetate toning bath is employed.

LENS.—R. FOTHERGILL writes: "With some very antiquated apparatus I have recently come into possession of is a lens I do not understand. The back lens is much smaller than the front; it bears the name of Horne & Thornthwaite, Newgate-street, and on it is 'caloscopic lens.' None of my friends can tell me anything about it, and there is no such firm in Newgate-street. Can you enlighten me on the point?"—The caloscopic is merely another name for the old orthoscopic lens. This form of lens is a good one, but it has been supplanted by others of more modern construction.

OIL ON LARGE PLATINOTYPE.—H. B. (Leeds) says: "My boy yesterday let two or three drops from the oil can drop on a large platinotype I have to frame. Instead of saying anything about it at the time, he allowed the oil (sweet) to spread in the paper. Is there any way of taking the grease out? Would soda and water do it?"—No. The oil may be extracted (we have little doubt, as we have never failed to do it ourselves) in the following way: Let a few drops of pure benzole drop on the spots, and, after it has been on a few seconds, blot off closely with clean blotting-paper. Repeat the treatment till the last trace of the grease is extracted. The benzole, if pure, will not leave a stain; if not, it may.

YELLOW PRINTS.—SOUTHSEA writes as follows: "I herewith send you one or two of my photographs, to see if you can explain the cause of the whites of prints going such an objectionable tint. They have been shown in a good north light (no sun) for about three weeks, and it occurs in some recent prints, while others I have, that have been printed for two or three years, are still pure and will stand any light, but the ones that are subject to it commence within a week or fortnight. It is evidently in manipulation, and, as it occurs only occasionally, I feel, with your advice, I may prevent it. I may add, I am most careful to see my printer gives full attention to instructions to washings between chemicals, but I somehow fancy the alum bath might be the cause, but anxiously await your opinion."—There seems but little question that the trouble is due to the manipulations, but, without seeing them carried out, it is impossible to say how. In all probability it arises from insufficient washing after the prints are taken from the alum bath; that should be complete. Try more complete washing at this stage, or omit the alum bath altogether.

WOODBURYTYPE.—T. writes: "I would be obliged if you would at some time inform me what is the largest size that is worked commercially, *i.e.*, can, say, 15×12 Woodburytype be produced, or has the process limitations which prevent it being worked to such a size? I have never met with any prints above whole-plate, but I have no means of ascertaining whether a larger size is workable, given, of course, suitable plant of increased power. Also, can you inform me what is the lowest workable pressure per square inch at which the hydraulic press must be run? On this point books are rather vague, saying from two to four tons per square inch."—The sizes produced commercially rarely exceed 10×8 to 12×10. Theoretically, there is no limit to size; but, in practice, the difficulties in working the process increase materially as the size is increased. The Woodburytpye process is better suited for small sizes, from a commercial point of view, than it is for larger ones. From two to four tons per inch is about as definite a pressure as can well be written, because it depends upon the metal used. If antimony or some other metals are added to the lead to give hardness, more pressure is required than when lead alone is used.

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EX CATHEDRÂ.

The Exhibition of Portraiture that is now on view at the Camera Club comprises nearly 150 examples of work, and is well worth visiting. The collection cannot fail to be instructive by reason of the fact that chronologically it almost covers the whole ground of photographic portraiture, and exemplifies the various processes that have been employed. Thus there are examples of Daguerreotype and collodion positive portraiture, as well as a series of calotype portraits of well-known artists and others made by D. O. Hill, in the year 1846. Examples of Mrs. Cameron's art, with which many of our readers are familiar, bring us down to more recent times, and we pass by easy stages to the well-retouched portrait of the show-case, that appears to be having somewhat of a bad time at the Exhibitions just now, until finally we come to the "heir of the photographic ages"—the portrait according to Hollyer or Craig Annan.

* * *

There is so much that is really interesting as well as instructive in this collection that it is a pity it must be dispersed. Especially eloquent are the fine portrait studies of D. O. Hill. They tell us that, after fifty years, the very best among our portrait photographers do not excel him in mastery of pose and lighting. So, too, may it be said of Mrs. Cameron's work, that, as studies for the portrait photographer, they are full of power and suggestion. It is not our intention to devote any lengthy remarks to this admirable Exhibition. In all probability it contains most of the best work that has been done in photographic portraiture during the last fifty years. There are some Taber bas-relief portraits on the walls; but, without this additional attraction, a visit to the Camera Club just now will well repay the time spent. Every credit is due to Mr. George Davison for his work in organizing the Camera Club Exhibition of Photographic Portraiture.

* * *

Mr. Maskell writes us: "May I be allowed to announce that the Photographic Salon will close on Saturday next, November 7, at 9 p.m. Pictures may be removed from the gallery on the evening of that day, between the hours of 9 p.m. and 11 p.m. provided that no packing or wrappers are brought in. Notice of arrangements for the delivery of pictures which may not be so removed have been sent to the exhibitors or to their agents."

* * *

This (Friday) evening there will be a Meeting of the General Committee of the Traill Taylor Memorial Fund, at the Royal Photographic Society's Exhibition Gallery, 5A, Pall Mall East, at 7.30 p.m. The business is to receive the report of the executive committee with reference to the disposal of the funds in hand.

* * *

Gelatino-chloride paper is suggested by a correspondent as having a use not usually accredited to it, viz., that of being a test for damp sheets. Our friend, who is obviously a commercial traveller, and, therefore, not without sympathy for his colleagues, writes to us as follows: "Having occasion to sleep in country hotels at frequent intervals, I always dread the idea of being put in a damp bed. The watch-glass dodge for testing the sheets is all very well in theory, but I find it difficult to judge by this method. Upon taking some gelatino-chloride printing-out paper out of a damp box, I was immediately struck with the idea of using it as a test for hotel beds. Of course, all photographers know gelatine is very susceptible to damp, and if a piece (say half-plate size) of gelatino printing-out

paper is placed *in a dry condition* between the sheets for a few minutes, it should be quite crisp if the sheets are dry, but, if damp, the paper will be quite limp. If it is damp weather, the paper can be dried over the gas or candle before placing in the bed. I send you this little tip, as I think photographers do their fair share of travelling, and often have to put up with all sorts and conditions of accommodation."

THE FUTURE OF PHOTOGRAPHY (?).

THE Forty-first Annual Exhibition of the Royal Photographic Society, which closes next week, may well be said to mark a new epoch in the history of photography. During the time it has been open, varied indeed have been the expressions of opinion we have heard regarding its merits. Some persons have strongly affirmed that it is the best show the Society has ever had. On the other hand, not a few have denounced it as being just the reverse, some going so far as to say that some of the work now most extolled would certainly have been rejected in the pre-Salon days. In some respects both are right in their ideas. The one looks at the show from an art point, and the other from a technical point of view.

When the unfortunate split occurred in the Society a few years back, and the Salon was started, it was alleged that some of the Linked Ring prognosticated that the yearly Exhibitions of the Photographic Society were doomed, if not the Society itself. What has happened? The Salon struck out with a new style of work, which, at the time, was freely condemned by the general body of photographers, by many ridiculed. This year it must be confessed that the Photographic Society, by its Committee of Selection, has copied the Salon. It has rejected some hundreds of technically excellent photographs, and has accepted a very large number of what, from a technical point of view, are very imperfect ones. Those who hold the opinion that the present Exhibition is, technically, a failure are termed by some "Philistines."

Without expressing any opinion whatever as to the merits of the two sides, we shall, for the nonce, consider the Exhibition entirely from the Philistines' point of view, and at once ask if it tends to advance photography, which is one of the chief functions of the Society? Its first law reads thus: "The object of the Royal Photographic Society shall be the advancement of photography, and the branches of science and art connected therewith." Does the present Exhibition tend to carry out that rule? The Jena glasses, for instance, have put new powers in the hands of opticians, who can now give us lenses that were unheard of before; but of what good are such lenses, if the type of photograph, as shown at Pall Mall, is to be the photography of the future. By far the larger proportion of the work shown there might just as well be produced by the most primitive form of lens, or, indeed, by no lens at all—a tolerably large pinhole would have answered the purpose. In many instances, lenses of high quality were, doubtless, used in taking the negatives; but the sharpness of the image has been lost, or purposely destroyed, in the prints. The general idea of the Society, some say, with this year's selection, seems to be that sharp pictures are not art, neither are bold and vigorous ones.

There is no gainsaying the fact that sharp and vigorous photographs may be artistic. Take, for example, the work of Colonel Gale, both at Pall Mall and at the Salon; it is both good photography and good art. These pictures are sharp and bold, and are quite distinct from the majority of the others, which are made in a low tone, and many from negatives that, at one time, would have been cast aside as failures. Which, then, of the two types will be the photography of the future? This is a somewhat important question, as it has a commercial side, and that must not be overlooked, as a large proportion of the Society is composed of professional photographers. Does the general public appreciate unsharp pictures in a low tone, and on rough paper? Will sitters, for example, who pay for portraits be content with their own counterfeit presentments if they are of the character of many in the two Exhibitions shown as "a portrait of a lady," study of a head, &c., or will the public purchase, say, landscapes or views of places of interest of the misty and fuzzy-type order, however artistic they may be according to the impressionist school? The general public do like, and, doubtless, will for a long time to come, a photographically good picture, and one that is at the same time also good artistically.

As we have just remarked, according to the first rule of the Society, its province is to advance photography, and the branches of science connected with it, as well as art. How is that served by the present Exhibition? There is not a single collotype shown; photo-engraving is represented by three or four very small pictures; scarcely any reproductions of works o art—a most difficult branch of photography, now mostly in the hands of foreigners—are there; no "process work" is shown, except the small illustrations in the catalogue; photo-chromotypography, chromo-collotype, or the three-colour processes, are not represented at all. It may be that none were sent in. But it may be asked is it not the province of the Society to obtain examples, in order to show the existing state of such important phases of photography? Most workers in these branches, at home and abroad, would, no doubt, be only too pleased to supply examples of what they are doing, if specially invited to do so.

One thing is certain, namely, that the Royal Photographic Society cannot please all, or ever will; but it may be a question for its future consideration as to whether it should not hold two Exhibitions annually, one to be devoted to the art side of photography, and the other to the technical side of it, or perhaps combine the two in one by having two distinct sections, separated entirely from each other. In this article, as we have said before, we express no opinion of our own, but simply echo the opinions that many others have freely expressed.

To Detect Formaline.—Some new and simple methods have recently been proposed to this end. One of them is by means of milk. One drop is added to the solution under examination, and the mixture is poured carefully on to a quantity of sulphuric acid in a test tube. The presence of formaline is shown by the production of a blue ring.

Standard Solutions of Hypo.—The reciprocal action of hypo, or, more correctly, thiosulphate of soda and iodine, and the usefulness of one for quantitatively estimating the other, renders any process of easy standardisation of considerable value. To standardise the hypo solution, Herr E. Rieglar uses iodic acid. On treating a solution of hypo with this chemical a certain reaction occurs ($6Na_2S_2O_3+6HIO_3=3Na_2S_4O_6+5NaIO_3+3H_2O$) and the smallest excess of iodic acid liberates iodine. Since this acid can be obtained absolutely pure, and can be completely dried over sulphuric acid, is not hygroscopic, and remains unchanged for a long time when dissolved in water, decinormal solution is a very serviceable reagent for standardising hypo solution.

Balloon Photography out-distanced.—We have on previous occasions described some results of scientific kite-flying, but quite lately, at Mr. Rotch's observatory at Bene Hill, near Boston, some extraordinary results in this direction have been obtained, as described in two successive numbers of *Science* last month. The kites employed were not the familiar toy of our childhood, furnished with yards of tail, but were the tailless Eddy kites and the Hargrave box kites, seven of the former and two of the latter being used, piano wire taking the place of the usual "string." The greatest pull on the wire reached as high as ninety-five pounds when the kites had reached their greatest altitude—8750 feet! On the occasions referred to, a large number of self-registering meteorological instruments were taken up by the kites, and many interesting records were brought down. There is very little doubt that, in lieu of the apparatus named, it would be quite possible to send up a photographic camera with arrangements for instantaneous self-exposures at intervals, or, possibly, exposure by electrical means. From its lightness, and the absence of the cumbrous arrangements for the use of gas when balloons are employed, it is obvious that kite photographs might play a most important part in military operations, and enable small parties to survey an enemy's country or strategical positions with an ease and celerity far outstripping balloon possibilities.

X-Ray Photographs from a Bulb without Terminals.—Mr. F. J. Smith, writing in *Nature* last week, describes some very remarkable experiments he has recently been making in this direction. Upon a protected plate a hand was placed, and four inches above it a Crookes' radiometer. "The terminals of Tesla coil were placed about half an inch from the bulb on either side of it, inclined to one another at an angle of 120°, the vertex of the angle being in axis of the radiometer. The Tesla discharge was allowed to bombard the bulb for four minutes. On development, a clear picture of the bones of the hand appeared. I failed entirely to get any X-ray results when only the usual induction sparks bombarded the bulb, these sparks often destroying the vacuum. My Tesla apparatus gives a spark three inches long in air at the normal pressure." After describing certain perceptible changes brought about without the radiometer, he goes on to say, "Thinking that the vanes on the radiometer might have played a considerable part in producing the X-ray photograph, I replaced the radiometer by a well-exhausted bulb, 4 cm. diameter, made of soda glass; the bulb was placed in respect to the conductors from the Tesla coil in the same position as the radiometer in the former experiment. I found that, with the same exposure and distance, a good X-ray photograph of the bones of the hand was produced. During the experiment the bulb was lit up with a bright and yellowish-green glow." Mr. Smith's experiments open out an entirely new field for experiment; but, in view of the fact that in the early period of Röntgen ray work it was stated that X-ray photographs were producible from the spark alone of an induction coil, Mr. Smith's observations would be still more interesting if he could say whether his photographs could not have been produced without any bulb whatever. Perhaps we may yet be informed on this point.

ON THINGS IN GENERAL.

The burning question—no pun is intended—for the season will undoubtedly be acetylene, whether to adopt it or not. The Editor has done wisely in drawing attention to the position taken by insurance offices in regard to its employment, the replies from the insurance offices, given in last week's leader, being eminently unsatisfactory. I can only hope with him that the advice given will not fall on deaf ears. Mr. Bolas's simile of a suspended weight is a just one. Acetylene, though it may be perfectly safe in the hands of experts, is by no means to be likened to coal gas; in fact, a stored chamber of mixed oxyhydrogen is in some respects safer. It is just one of those bodies which have an unhappy knack of exploding in most unexpected manners, but for which untoward behaviour the simplest and most natural explanation is immediately available—after the event. Then, perhaps, for the first time in his life, the victim reads his insurance policy—how many are there who have read their policies any further than the amount insured?—and he finds he has been acting against the agreement, and forthwith becomes very angry. Against himself? Oh, no, against the insurance company for putting in the prohibitory clauses. However, notwithstanding all this, acetylene is such a valuable agent that there is little doubt the whole bearing of the case will be thrashed out, and reasonable conditions eventually offered by the offices. There is no reason why some such apparatus as has recently been fully described in these pages should not be employed with perfect safety. The chief danger, it appears to me, lies in the possibility of some hitch in the application of the water occurring; a very small quantity only, for example, gaining access to the carbide, the consequences from which might be of the utmost seriousness. I should like to express my great appreciation of Mr. James Swinburne's treatment of the subject in his lecture before the Society of Arts—that is to say, if he is still alive; for after reading what he had to say about the feminine element in connexion with the use of such novelties, I felt a sympathetic shudder as to his fate when his remarks came to the ears of some of his lady friends. "Women," he says, "are wanting in the faculty of understanding things, and they have the unreasoning conservatism and conventionality belonging to the undeveloped mind as seen in boys and savages." Really, Mr. Swinburne, you are a very brave man! But to return to my topic, he does well to point out the false analogy so often drawn between the cost of acetylene as made on the spot and ordinary coal gas as delivered at one's doors; in fact, even at existing prices there are few gas companies anywhere who would make much show on dividend day if it were not for the residuals—the tar and ammonia, &c.—they sell. There are no residuals of much value in acetylene making, and, if it had to be made like coal gas at a central station and then delivered, a very different tale as to its price would have to be told.

I have been quite pleased to read the last issue of this Journal in comfort, for I have so much been occupied lately in picking out the few grains of photographic interest, that I almost forgot it was not the *Chemist and Druggist's Journal* I was reading. What a mighty pother has been raised because some little-needed chemical has had to be purchased from a registered chemist, instead of a photographic dealer! A photographer can buy his plates, his hypo, his pyro, his gold chloride from any stock dealer he likes, but has to go to the chemist for his corrosive sublimate. The unfortunate chemist and druggist is the only tradesman who has to go through a series of stiff examinations before he can open shop in a proper manner; surely he should have his reward—even if it is only in matters photographic—the power to sell a few annual shillingsworth of poison.

Now, if the complainers had to face such a state of things as, according to the extract in this Journal a fortnight ago, he has to do in the United States, they might have some case to go upon. With hypo over sixpence an ounce, and carbonate of soda two shillings a pound, we might fairly expect to see bichloride at a guinea or two a pound! But even here there is another side to the question. A first-class chemist prides himself upon always buying the best chemicals he can, and his prices must be compared, not with the class of chemical that the photographer is content with, but with the high standard of the shop in question. I have before me, as I write, a wholesale price-list (prices that the chemist would himself have to pay). I find the best hypo costing a shilling a pound, and the same price for best carbonate of soda crystals.

So much for the chemists. Let us look at the photographic dealers. I have often seen chloride of gold quoted at 14*s.* a dozen fifteen-grain tubes, and, when single tubes are bought, 1*s.* 6*d.* or 1*s.* 9*d.* has been asked for a similar tube. Where is the honesty here? Chloride of gold, or the double chloride, has so long been sold of a recognised quality of seven grains metal to a tube that any deviation from that quality is a distinct fraud. If this is to be permitted, there is no limit whatever to the reduction in the quantity of gold present in a tube of gold. When it is considered that a sovereign, which, of course, contains a pound's worth of gold, only weighs about 123 grains, and contains 113 grains of gold, it is very easy to reckon how much gold is obtainable for fourteen pence.

Certainly not fourteen pennyworth, even if the containing tubes were stolen, and the cost of manufacture and acids were *nil*.

It is quite possible that some discrepancy of this sort may account for the trouble of "Printer," who in the Correspondent's column, asks why he uses fifty per cent. more gold than is used by a relative of his employer for a similar number of prints. The Editor's answer is, in all probability, the correct one; still, the above consideration must be taken into account, as also the possibility of the expensive one of the two not trimming the edges of his prints before toning.

What a fund of interesting reading is to be found in those columns! Another example: a photographer who has purchased a business, wants to know whether the reception-room lady is not asking an exorbitant price in wanting 25*s*. per week and a commission, which would bring it to about 27*s*. All I can say is, that if the inquirer knows so little of his business as to ask the Editor what he ought to pay for the salary of his chief assistant, the sooner he ceases to run a studio the better it will be for his pocket.

I have heard surprise expressed in many quarters as to the finding of the County Court Judge, who gave a verdict in favour of the plaintiff who had sent some plates to a customer's order, the plates eventually being delivered smashed. If every dealer is expected to insure his goods before dispatching them, the price of many of them would rapidly "go up." It is perfectly just for the dealer to take the position that when he delivered the goods to the railway, and so long as the packing is efficient, and the nature of the goods declared, any loss must be borne by the consignee. This is both law and justice!

FREE LANCE.

DIGRESSIONS.

XI.—"THE BEARINGS LIE IN THE APPLICATION."

FOR several years I have been endeavouring to show that, if the student is to get all out of pictorial photography that can be got, he must go at it in a whole-hearted manner and not be tempted from the path by side issues. In doing this I have had to say pretty strongly that a great deal of time and talent has been wasted on that which has no more to do with pictorial photography than the manufacture of colours and canvas has to do with the painter; in fact, just as much and no more. Somehow or other, sometimes by misunderstanding, and sometimes wilfully, this has been gradually interpreted to mean a "hatred of science" on my part, most condemnable. I think the time has come for me to make as serious a reply to—I won't call them my detractors—as such a curious mistake will allow.

The title to the first article I ever wrote on photography was *On the Simplicity of the Collodio-albumen Process*, and I think it may fairly be claimed as characteristic of nearly all I have written since, which has had for object the endeavour to clear away as much as possible all difficulties, complications, and hindrances to the photographer getting straight to his proper work, leaving all else to those whom it may concern. In doing this, I have had to deprecate the necessity of the photographer having anything to do with the manufacture of his materials, or to enter into chemistry, or other science, further than was required for him to understand the use of the tools he employed; surely enough knowledge for any artist. Time was when the photographer, like the painter, had to make most of his materials, simply because there were no makers to supply him with them, but now there is almost something comic, if the waste of time were not tragic, in the earnest photographer troubling himself with what can be done better and cheaper for him. He may as reasonably cook his own dinner, or black his own boots.

It was different until about 1880. Before that year every man had to be his own chemist; since that time there has been no use for any photographer (I don't mean experimentalist) to understand, as I have always put it, more of technique than *the efficient use of his materials*. If he is a photographer only, what more does he want to know about his materials than how to use them? What more would further knowledge add to the effect of his result? Of course, I credit him with the usual modern school education. Nearly all the rest he will find on the packet of plates or paper he uses, or in any of the handbooks; and, in fact, the nearer he keeps, as a rule, to the instructions of the manufacturers, whose interest it is for his goods to be successful, the better will be his results from a technical point of view, and the more time it will allow him for the mental part of his art.

I have only one object, and that is to see photography flourish; and by photography I mean what the word means, not process nor emulsion-making, nor modification of developer, nor any playing at science whatever. I reiterate, as I have done again and again, that I have a very great respect for real science, even abstract science; but I look upon it as a thing apart, a thing we could not have done without in the past, which should certainly be cultivated, and will surely be useful in the future, but will always be the work of a separate mind from that of the artist who uses the processes of photography.

There are several of our—shall I call them abstract—photographers for whom I have the greatest respect, and read with admiration much of what they write; I dont mind mentioning names as types—Abney, Bothamley, Pringle—but, as a pictorial and practical photographer, I look upon the subject from another standpoint. It is when science is watered down to what we usually get, the stuff that is manufactured to "fill up an evening," or to be an excuse for certain poor articles that are written, that I cannot help thinking it does absolute mischief by distracting the student with unnecessary trivialities. And I must ask my reader to bear in mind that it is not the bad scientist alone that I object to, as seems to be commonly supposed, the bad artist is quite as objectionable to me as the sham scientist. I have frequently said that what is represented symbolically by scales and weights is not a help, but a hindrance, to the pursuit of photography, when the art is properly understood. Will any of those who think I am too severe on science in relation to our art refute me? It may easily be done if the material is at hand, as those who have objected to my teaching should have made sure before they spoke. Will they send me the names of any scientists who have succeeded in photography—I mean the photography which is not something else? I am quite aware that many of them are successful in making pretty photographs, and I have known two or one rare instances of one or two getting a little beyond "the usual thing," but not very far; and, what is more, they don't expect to get further, for most of them seem to take pleasure in saying thay know nothing about art, and how can anybody expect to succeed in any subject he knows nothing about? Yet, strangely enough, they never hesitate to give their opinions about art, and, indeed, sometimes undertake to judge pictorial work as if they *did* know something about it! Now, on the other hand, we pictorial photographers, although we have never boasted that we know nothing of the subjects, have never had the presumption to read papers, since we were boys, on mathematics, optics, or chemistry, or any of the abstruse subjects that are made to belong to photography. Scientists waltz in gaily, where artists modestly creep on tiptoe.

And thus, in trying to make things simple for artists who use photography, and clear away some of the irritating hindrances that have grown up around the art, I believe I have got a sort of evil reputation for a hatred of science. Only lately an American writer, in a very kind and appreciative article, headed, "Can we learn too much?" is quite sure I am wrong in saying the photographer—the pictorial photographer, it must always be remembered—need know little more science than how to efficiently use his tools, and that it is not possible to learn too much. He says he does not believe that I would (I quote his words) "really undervalue necessary knowledge, and think his (H. P. R.'s) recommendation to leave it alone arises from a fear that the student will be tempted on its account to neglect the study of the higher phases of photographic picture-making—art itself. But the fear is unfounded. Those who go in for photography as they would for any other amusement may, and probably would, but I do not speak of or write for them. The man who is worthy of photography does not regard it as a plaything with which to pass a leisure hour, but as a means of realising and showing to others something of the emotions and impressions that nature produces in his own mind, and he knows, and the higher up the ladder that leads to success he gets the more thoroughly he knows, that the goal at which he aims can only be

approached, never perhaps altogether reached, by patient, persevering study."

This is good, and agrees with all I have ever written. The pastime photographer is not worth troubling about, and the man who has the conpelling influence towards picture-making is safe, it is the next rank that wants warning against illusions, and strengthening with good advice. There is not only the fear, but the knowledge that science, the showy pseudo science we meet with among photographers, is so exceedingly easily acquired, and picture-making of the advanced kind so difficult, that it is easy to lapse from the pursuit of one to the other.

Perhaps I ought to explain what I mean by science in this particular. I do not mean the higher branches of science, but the pretentious sham kind with which our art abounds. As an illustration of the sham scientist might be mentioned the man who has tried all the developers, and talks of nothing else except similar trifles. This man would be useless as a picture-maker; he is lost in the shallows. He may be a capital paddler, but could never have a good swim in the depths. The man who can give you advice on all subjects, both particular and minute, in learned language is a lost photographer. The suspicion usually is that he knows this, but must make a reputation at all costs; so is the one also lost who passes his time inventing little things. I have often repeated that a profound knowledge of science either cramps the artistic faculty, or, what is more probable, shows an order of mind to some extent inimical to a feeling for art. Both faculties are rarely found to exist in the same person. What I assert is the result of long observation, and lately I have searched carefully through the last four years' catalogues of the Salon and the Pall Mall Exhibition for a picture made by a scientist; I have done this with every desire to refute myself and to find what I looked for, but I met with as much difficulty as, and had no more success than, Diogenes, when he searched for an honest man in the daylight with a lantern.

It is not true science, but too much of it for the purpose, that is objected to. I don't deny that photography is the result of science, so are nearly all our great inventions, and some of our discoveries, but the practice of pictorial photography does not require so great a name. It is now reduced to a simple matter, that need never go beyond the use of easily used tools. For the present our tools are adequate for our purpose, notwithstanding which we are ready to accept improvements when they are offered to us by proper and responsible persons; but it is not for pictorial photographers to turn from their true path to go worrying after them, and we don't want scientists worrying after us with *supposed* little improvements, of which we have had to discard such quantities the last ten years.

Taking all these things into consideration, I still feel that I am doing my duty when I entreat those photographers who want to succeed in pictorial photography to go straight to their object, turn deaf ears to all distracting studies and those which are not essential, and then they may in time succeed.

The following will illustrate and help to confirm what I have written.

A letter-writer in a contemporary some time ago, in relation to another matter, gave a quotation from Mark Twain's *Life on the Mississippi* that exactly shows the effect of too much fact, and science is the art of fact.

"Now, when I had mastered the language of this water, and had come to know every trifling feature that bordered the great river as familiarly as I knew the letters of the alphabet, I had made a valuable acquisition. But I had lost something, too. I had lost something which could not be restored to me while I lived. All the grace, the beauty, the poetry had gone out of the mighty river."

Then he goes on to describe the gorgeous sunset, and wondrous beauties of the river, too long to quote. He describes how, as the facts came in the poetry went out; and the splendid effects began to be looked upon after this fashion: "This sun means that we are going to have wind to-morrow; that floating log means that the river is rising; that slanting mark on the water refers to a bluff reef which is going to kill somebody's steamboat one of these nights; those trembling 'boils' show a dissolving bar and a changing channel there; that tall dead tree is not going to last long, and then how is a body ever going to get through this blind place at night without the friendly old landmark," &c.? All the poetry and beauty were gone, and knowledge brought nothing but cold facts.

H. P. Robinson.

FOREIGN NEWS AND NOTES.

Eikonogen and Para-amidophenol.—Dr. Andresen gives the following as the best formulæ for these developers, both for plates and papers:—

Sodium sulphite	2½ ounces.
Potassium carbonate	1 ounce.
Eikonogen	288 grains.
Boiling water	20 ounces.

The solution should be placed in bottles whilst still hot and immediately corked. It will keep for any length of time, and, if it acts too energetically, should be diluted with a corresponding quantity of water. If very delicate negatives are required, the above quantity of potash should be reduced by one-half. If over-exposure is feared, development should be begun with very dilute developer to which some potassium bromide has been added. For bromide paper the developer should be diluted with five parts of water. A two-solution developer can be made as follows:—

1. Sodium sulphite	1½ ounces.
Water	20 „
Dissolve and add eikonogen	150 grains.
2. Sodium carbonate	3 ounces.
Water	20 „

For use mix 3 parts of No. 1 with 1 part of No 2.

For para-amidophenol he suggests for a two-solution developer:

1. Para-amidophenol	192 grains.
Water	20 ounces.
2. Sodium sulphite	576 grains.
Potassium carbonate	576 „
Water	20 ounces.

For use, mix 1 part of No. 1 with 2 parts of No. 2.

For a one-solution developer dissolve 5 ounces of potassium metabisulphite in 20 ounces of water and add 800 grains, and add saturated solution of caustic potash till the precipitate first formed is redissolved. This will keep for a long time, and for use should be diluted with from 10 to 30 parts of water.

Tricolour Projection.—M. Marguery suggests the following baths for obtaing the self-coloured images for projection:—

For the Red Sensation.

Carmine	5 parts.
Ammonia	15 „
Water	100 „

For the Green Sensation.

Saturated solution of picric acid.

For the Blue-Violet Sensation.

Methylene blue	10 parts.
Water	100 „

Glass coated with plain gelatine should be soaked in a three per cent. solution of bichromate of potash, and then dried and exposed under the negatives, developed with hot water, and then soaked in the above baths.

Newspaper Imprints.—It is well known that plates wrapped in newspaper will show on development all the printing, which is extremely difficult, if not impossible to remove. According to the *Photographische Rundschau*, this impression can be entirely removed by bathing the plates before development in a two per cent. solution of acetic acid and well washing with water, and then treating with an alcohol bath.

Neutral Developers.—Professor R. Namias has been experimenting with neutral developers made with magnesia and sulphite, and finds that, though slow, they act well. The equations representing the chemical reactions he states to be as follows: The hydrobromic acid set free by the reduction of the silver bromide sets free sulphurous acid from the sulphite—

$$2HB_2 + Na_2SO_3 = 2NaBr + H_2SO_3,$$

and the developing action is lessened. If now magnesia MgO is

added, the sulphite is neutralised with the formation of magnesium sulphite.

$$MgO + H_2SO_3 = MgSO_3 + H_2O.$$

In this manner the developer remains neutral the whole of the time. If developers are used in which the acid of the radical is not completely saturated, the magnesia will neutralise this and the developer be more energetic. Magnesia developers have less tendency to oxidise, and no ill effect is produced on the gelatine. Pyro, eikonogen, and metol are suitable for this kind of development, but hydroquinone loses all its developing power. Such developers are best prepared by using double the normal quantity of developing agent with the corresponding quantity of sulphite, and adding about fifteen parts of magnesia to every 1000 parts of solution. After use it can be poured into a bottle for repeated employment.

Keeping Developers.—Coconari sugges the addition of one or two small fragments of calcium carbide to developers when they are to be kept, so that the air may be driven out and acetylene take its place. The disadvantage to what seems a perfectly feasible plan is that calcium hydrate would be formed, and this would react with any alkaline carbonate, and, forming the alkaline caustic and carbonate of calcium, be precipitated; and, further, acetylene has a reducing action on the salts of silver.

Cyanine as a Colour Sensitiser.—Schumann, who is so well known for his researches upon spectrum photography, points out in Liesegang's *Photographischer Almanac* that most of the difficulties met with in using cyanine as a colour sensitiser are due to the employment of plates of too high an initial sensitiveness, and to keeping the plates too long. He states that a plate sensitised with cyanine must be used at once, and that, even after a day, it does not give such clean negatives as when used immediately it is dry. The developer should be of moderate strength, and with plenty of bromide.

Metol.—Schienol states that metol by itself is not a developer, but that in the presence of sulphite, although it works slowly, it is excellent, and he ascribes it to the too free use of an alkali. He affirms that a developer composed of five to six per cent. of aqueous solution of sodium sulphite, with the addition of one per cent. of metol, will give denser negatives than one with a lot of alkali; further, that the plate may be left in the developer for some considerable time without becoming fogged or suffering in any way. The development is necessarily slow, but, with an addition of one per cent. of washing soda, it may be hastened, but not with superior results.

Banded Spectra.—Wiedermann points out that it is generally considered that complex molecules give banded spectra, whilst atoms give line spectra. But this, he says, is not quite correct, as proved by Eder and Valenta's researches upon the spectra of mercury vapour; and also, according to Schmidt, cadmium and zinc in a vacuum tube, with low power, and plenty of these vapours give bands in the violet. Potassium and sodium also give in vacuum tubes continuous spectra in the red and green, which are similar to the continuous spectra first observed by Warburg, and they also give a fluorescent spectrum, which, in the case of sodium, consists of a series of bands in the blue and green, of which the more refrangible mainly consist of single lines, but the less refrangible cannot be thus resolved.

Sodium Tribasic Phosphate.—Dr. Max Kortüm strongly recommends the use of this salt to replace the ordinary alkalies, and suggests the following developer:—

1. Water	400	parts.
Sodium sulphite	40	„
Hydroquinone	5	„
2. Water	200	„
Sodium tribasic phosphate	32	„

M[illegible] have a[illegible] *his materials.* parts. He further states that the action of the salt to know about [illegible]ption of carbonic acid from the air, and its con- would further kn[illegible] into sodium carbonate and phosphate.

I credit him with the usual modern sc[illegible] rest he will find on the packet of plat[illegible]

Carbon Work.—Helheim of the handbooks; and, in fact, the never been very successful with zinc, on account of the difficulty of burning it in, as the zinc begins to melt or crystallise. He has overcome this difficulty by applying the commercial forty per cent. solution of formaldehyde to the enamel film, and also adds a little to the etching fluid. He suggests the addition of a little formaline to the ferric chloride solution for photogravure in order to obtain greater contrast.

A Universal Developer.—Kastner, of Vienna, suggests the following glycin developer as the universal developer. In a bottle capable of holding a pint place 16 ounces of water, and add 1 ounce of carbonate of potash and ½ ounce of glycin, and, when all has dissolved, 1½ ounces of sodium sulphite. This costs about one shilling, and may be used over and over again both for negative and positive work.

Yellow Screens.—Fleck suggests the following as the best yellow screen for use with erythrosine-sensitised plates. Dissolve 10 parts of acridine yellow in 150 parts of alcohol, and 5 parts of fuchsin in 100 parts of alcohol. To 100 parts of two per cent. raw collodion, add 20 parts of the acridine solution and 7 to 8 parts of the fuchsin solution.

DYES AND PIGMENTS IN PRACTICAL PHOTOGRAPHY.

IV.

The practice of film-staining has now become a recognised method of securing not only freedom from halation, but also a more perfect rendering of colour values. Unfortunately, a great difficulty is encountered when we attempt to explain the exact influence of the dye in the production of orthochromatic effects. This difficulty consists in the uncertainty which exists as to the precise action which takes place. It is not yet definitely established whether this action is physical or chemical—that is, whether the light vibrations absorbed by the dye are transferred to the sensitive silver salt, or whether the dye itself is decomposed, so as to act as a kind of developer to the silver salt. A complete discussion of the arguments in favour of these rival theories would be beyond the scope of this article, but certain facts have been established which undoubtedly guide us in the selection of suitable colour sensitisers. We are here again confronted, however, with somewhat conflicting evidence on account of the great variability of the commercial samples of dyes employed by different workers.

In the first place, the colouring matter combines with the silver salt to form a lake, the colour of which is not always that of the dye. For instance, Carey Lea observed that some blues dye the silver salt lavender, while methyl green produces pink. The behaviour also is not the same with the different haloids. Those dyes which do not form these lakes are useless for producing orthochromatic effects, for which reason the aniline dyes are useless for this purpose.

The majority, if not all, of the dyes which are useful as sensitisers are unstable in sunlight. Even those which are apparently stable are probably fugitive in thin films. In this connexion Abney has shown that the fugitive dyes only bleach when exposed to the rays which they absorb, and they may be kept for an indefinite period if protected from those rays.

It is difficult, if not impossible, to establish any connexion between the sensitising action of dyes and their chemical composition, although there is undoubtedly an agreement in the behaviour of bodies of analogous constitution.

To produce any sensitising effect upon any kind of ray, the ray in question must be absorbed by the dye. Hence the absorption spectrum of the dye is the key to its behaviour as a sensitiser. Unfortunately the absorption spectrum of dyes is influenced by other considerations, such as the nature of the solvent, the density of the medium (causing, by Kundt's law, a displacement of the absorption band towards the red), and the impurities present in the gelatine tending to form lakes with the dye. Then, again, the quantity of dye necessary to produce a sensitising action is so extremely minute that its behaviour in a gelatine film may differ entirely from its properties in mass. It is not always possible to predict, therefore, what will be the precise nature of the absorption spectrum of a dye when present in an attenuated condition in a gelatine film. Nevertheless, in estimating the probable behaviour of different commercial samples of dyes, it may generally be taken that, other things being equal, those which have the same absorption spectra will have the same sensitising action, although mixtures of dyes do not always produce an effect equal to the sum of their separate actions, one dye sometimes neutralising part of the effect of the other.

Although a large number of substances have been found to possess the property of behaving as colour sensitisers, comparatively few have actually come into general use for this purpose, the most important being the phthaleine group and its related compounds, the quinoline dyes. Of the phthaleines, the most active are eosine and erythrosine; and, of the quinoline group, cyanine (quinoline blue), quinoline red, and azaline, a mixture of these two dyes, have been found most effective.

In practice, the photographer will find it advantageous to purchase ready-dyed plates, of which the exact constitution is a trade secret. There may be occasions, however, when it may be necessary to dye ordinary plates by the bath process, when the following method may be followed:—

Prepare stock solutions of cyanine, one part, in alcohol, 2000 parts; or erythrosine, one part; water, 1000 parts. For use, take one drachm of either, and add ten drachms of water. If cyanin is used, it is necessary to add one drachm of a ten per cent. solution of ammonia. The plates in this case must be used within two days; but ammonia is not necessary for erythrosine, and the plates thus prepared will keep several weeks. The plates are simply immersed in the solution and dried in the dark. The duration of the immersion is important, two or three minutes being enough. Too short a time produces inequality, and too long an immersion reduces sensitiveness, owing to the presence of an unnecessary amount of colour in the film.

The study of the absorption spectra of dyes, and their action as colour sensitisers, is readily accomplished by means of an ordinary optical lantern with a spectroscope attachment.

Gelatine films, coloured with various dyes, are interposed in the path of the rays from the spectroscope, and the position of the absorption bands noted. Bromide paper, dyed with any of the colours, is then submitted to the action of the pure spectrum for a few minutes, and, during the exposure, the limits of the spectral colours are noted by a pencil mark on the bromide paper. On development, the positions of maximum and minimum effect can be readily compared with that of an undyed plate.

When using gelatine emulsion, only those dyes can be used which are soluble in water; certain dyes, such as chlorophyll, soluble in alcohol, can only be successfully used with collodion emulsions. Some samples of eosine, in which the metal potassium is replaced by the ethyl or methyl group, are also insoluble in water.

A great deal of the discrepancy which has been found to exist in the results of different workers is, no doubt, to be traced to the difficulty in obtaining commercial samples of the dyes of uniform purity and composition.

J. Vincent Elsden.

FLEXIBLE FILMS.

[London and Provincial Photographic Association.]

Film photography is not a subject of to-day, of the year even, like the X rays, but it originated in one of the very earliest efforts of photography—with the Talbotype process, for which Fox Talbot took out a patent in 1841.

Briefly, the process was to select a paper of fine texture, and brush it over evenly with a solution of nitrate of silver. It was then dipped in a solution of potassium iodide, converting the nitrate into iodide of silver. The paper was then rinsed in distilled water to remove the bye-products—excess of iodide and potassium nitrate—and then dried. Prior to exposure it was brushed with a solution of nitrate of silver, acetic and gallic acids. The paper was then ready for exposure, and development was effected by brushing it over with a further solution of nitrate of silver and gallic acid.

As this process now is purely historical, I have not attempted to produce any specimens, for in this particular form it is not likely ever to come into use again. However, with this process excellent results were obtained. As the paper was made semi-transparent with waxing, the process may fairly be credited with having suggested the paper-negative process referred to later on.

Glass shortly afterwards was introduced for use in connexion with wet collodion negatives, which is beyond the scope of this paper. Scott Archer, in 1855, introduced and patented a method of coating collodion negatives with a solution of guttapercha in benzole. When dry, it was stripped from the glass support; but I am unable to find that Archer used paper, and I refer to this invention as it leads up directly to the experiments made by Dawson and Warnerke in 1868.

The latter made a film of alternate layers of collodion and rubber, coating it with a film of dry collodion emulsion. These films were made up in pads, like a blotting pad, orange paper being inserted between the films to protect the one underneath from light during exposure in the camera, the whole being backed with a piece of sheet zinc to fit into the camera dark slide. Mr. Warnerke, who, unfortunately, is not well enough to attend here to-night, has kindly sent me some negatives taken on these early collodion films, and I pass them round for examination. These films bear Mr. Warnerke's own description and the dates when taken, in 1876 and 1877.

On the introduction of gelatine emulsion, greater facilities were offered to the landscape photographer, and manufacturers at once commenced to seek for a substitute for glass, which hitherto had been a necessity in connexion with wet collodion. Glass always was, and, unfortunately, still is, very heavy, as well as brittle, and during the seventies was very costly.

In 1879, Ferrier, in France, made a film of gelatine, and waterproofed it with coatings of collodion. Balagny, in Paris, used at this time a collodion base for a gelatine film; and Stebbing (also in Paris) a gelatine film, hardened with alum.

About 1886, we find that the Eastman Company, and, in 1880, Morgan & Kidd, introduced a modification of the Talbotype process. They used a Saxe or Rives paper, coating it with gelatine emulsion. After exposure in the camera, development, washing, and drying, the paper was treated with vaseline or castor oil, to make it transparent, and so hasten the printing.

This Society has already in its possession some fine paper negatives evidently made in this manner; it was not therefore necessary to make specimens, for you are all familiar with their character and quality. These paper negatives give excellent prints, but even when waxed or oiled do not print so quickly as a glass negative, and the oiling process is a dirty, messy operation. We cannot consider, then, that paper prepared in this manner for negative work is satisfactory.

As to the texture of the paper being objectionable, excepting for very small negatives the defect, if any, is exaggerated. However, in 1881, plain paper as a substitute for glass is put on one side, and various films of gelatine are suggested. The Eastman Company introduced their gelatine stripping film, still sold, I believe, by them under the name of Transferotype. This is a film of gelatine emulsion, somewhat hardened, that is, coated on paper previously covered with a very soft, soluble gelatine, melting at a low temperature in warm water. The negative is exposed, developed, washed, and squeegeed on to waxed glass, allowed to rest a few minutes, and put into warm water. This tepid water dissolves the soluble gelatine, leaving the emulsion film on the glass. A skin of plain gelatine is then pressed over it, the whole allowed to dry, and then detached. This film was exposed in the camera, in a film carrier as sample [shown], or used in a roller slide which was at this time introduced by them, and another form by Warnerke. At the same period Froedman introduced a gelatine film, sold as the "Vergara" film, consisting of a collodion base coated with bichromated gelatine, exposed to light, and washed in water and dilute sulphurous acid. As this film is not likely to be reintroduced, I have not prepared any specimens on it.

In 1881, Warnerke introduced a gelatine film, made on paper. This was exposed, &c., and dried. When *dry*, it was detached easily from the paper support, and you then had a rigid gelatine film, as transparent as glass and equal to same in every respect—superior in some. I pass round specimens made by me on paper prepared in this manner, only partially stripped, so that they may be detached by you and examined. This process I certainly have a great liking for myself, and where time is not an object, it is a process that gives everything that can be desired. The great objection to gelatine films is, however, that, so far as is known at present, gelatine can be only made insoluble, but not impervious to water.

In the necessary operations of developing, washing, &c., a large quantity of water is absorbed, and thick films of gelatine consequently take a very long time to dry.

With our recent knowledge of formaline, an improvement in this could be made; but gelatine films of themselves cannot compare with celluloid—to which I now refer—for simplicity of working, although superior in other respects. The first mention I find of celluloid is in a paper read by Fourtier before the Paris Photographic Society in 1881. But it is to America that we have to credit the greatest advance made, both in the manufacture of celluloid and films on celluloid. Carbutt appears to have at once taken up the idea, and certainly had the start of English manufacturers. Celluloid films at the present time are sold in two forms—rigid for slide work, and in rolls for roller slides and cinematographs. But to this subject I shall return later on.

Warnerke at this period (about 1881-1882) introduced various processes for film work. One was the use of vegetable parchment; another that of tissue paper, made quite transparent prior to coating. For these processes he coated his paper *on both sides*. At a meeting of the Royal Photographic Society, held in June, 1885, he stated that the double coating was designed to obviate the imperfections of all grain in the paper, and "to render the quality of the print even superior to one obtained from a glass negative in roundness and pluck." Such negatives I pass round. The print on the double-coated tissue paper is very good, and could hardly be improved. The texture of the paper is not discernable, and the rapidity of printing is nearly equal to a negative of equal pluck and density on a glass plate. A very ingenious form of carrier for these films was devised also by Warnerke—a piece of 3-ply veneer, having a piece of soap plaster attached to the face. On this the paper was simply pressed, and then placed in the dark slide.

Another paper for which he took out a patent has been discussed at the last two meetings of this Society. I allude to his "Wash out pro-

cess," based upon the action of pyro on a sensitive gelatine emulsion that is exposed to light.

Those portions that are exposed are acted on by the pyro, and become insoluble; those not acted on dissolve in warm water.

Paper is coated with a gelatine emulsion—bromide or chloride—exposed, and developed with pyro-ammonia. Before fixing, it is squeegeed on to glass. After three to five minutes, the glass is placed in warm water, the paper is dissolved off, and the soluble portions of the film washed out.

I have made a positive by this process on paper I prepared myself, and it will more clearly explain the advantages of the method for process work, where it is necessary in the high lights to have bare glass. This paper is still prepared by Warnerke, and is sold exclusively for process work. The positive can be transferred to zinc or copper, and the gelatine relief inked up to form the first resist to the etching acid.

I can fairly introduce now a form of film prepared by the Gem Plate Company for collotype work, or any process where a reversed negative is required. This is a very clean and dense-working, slow emulsion, suitable for copying purposes, that is specially coated on prepared glass to allow the film to be stripped after development, fixing, washing, and drying. Usually a coat of collodion is given to strengthen the gelatine film, and this is so thin that the stripped film can be used from either side without distortion.

Another form of film, with a paper support, has also been suggested—a sensitive film coated on a starched paper. After exposure and before development, it is placed in water, and at once pressed on to a sheet of clean glass. After allowing it to partially dry and become firmly attached to the glass, it is placed in cold water, and very shortly the starch substratum dissolves and allows the sensitive film to be developed from the back.

This is hardly a practical method, as it necessitates a stock of cleaned glass to be always at hand.

The only other film I have to mention is of very recent date, namely, the Wellington film, made by Wellington & Ward. According to the instructions they issue with the films, they can either be left on the paper on which they are coated, or stripped whilst *wet* and *transferred to a prepared glass plate*.

Having now exhausted the historical portion of the subject of the paper this evening, we should consider what are the requirements of a perfect film support for the sensitive emulsion we require.

1. A film that is as transparent as glass.
2. A film that is made rigid for cut sizes, or that can be made flexible for roller slides.
3. A film that does not require the backing of paper or other substance as a support at any time.
4. A film that is impervious to water.
5. A film that remains flat during and after development, and will dry without being attached at any time to glass.
6. A film that has no prejudicial chemical action on the sensitive salts of silver.
7. Lastly, a film that is as cheap as glass.

A pure gelatine film on paper detachable when dry, meets all the requirements named excepting conditions 3 and 4. It must be supported by paper, and is not impervious to water, consequently such a film (as I have shown to-night) takes a long time to dry.

Of gelatine films I consider it the best, for being able to use the paper as a support from the exposure until *dry* is a great advantage. Yet celluloid being quite impervious to water offers yet further advantages, although in celluloid we meet several disadvantages.

It is practically as transparent as glass. It can be made rigid or flexible, and does not require any support at any time. It is quite impervious to water, but it does *not* remain flat during development or when dry. It has a prejudicial chemical action in many cases on the emulsion, and the price is so high that it is quite impossible for manufacturers to sell celluloid sensitised films at the price of glass dry plates.

The solvents employed in the making of celluloid are ether, alcohol, or amyl-acetate—all very expensive chemicals. Consequently, the price is double that of glass and is likely to remain so.

Yet celluloid, for the want of a better material, is very largely used for films. I hope, however, that the new material I shall now introduce will shortly take its place, for the reason that it meets all the requirements essential to a perfect film that I have already enumerated.

It is the outcome of considerable work on the part of a member of this Society—Mr. Banks—and the specimens I shall show are not from the commercial finished article, but from experimental coatings that have passed just out of his hands, and were annexed by me for the purpose of assisting to illustrate the paper this evening.

From the specimens I hand round, you will notice that it is quite transparent. That it is rigid, so as to be suitable for cut sizes—it can also be made thinner for roller-slide work. It is not supported at any time by paper. It is impervious to water. It is perfectly flat during all processes of exposure, development, and drying. It has no chemical action, theoretically, on the emulsion. And lastly, it will be placed on the market almost at once, at the price of glass.

At this time of the year, it is very difficult to start out with a camera and make a dozen specimen negatives in a given time, so I have brought mostly transparencies to show this evening, together with a few negatives.

The negatives also, it should be noted, are made on chloro-bromide emulsion, as for experimental purposes it has been found more easy to work.

To develop the negative the process is very simple. Take the film, moisten it in a dish of clean water, or under a rose tap. Use plenty of developer, and put the developer in the dish before the film. Place the moistened film in the developing dish, and rock it well. It is important that the film is not allowed, during development, to stick to the bottom of the dish, as it is coated with emulsion on both sides. Fix, wash for half an hour; place for five minutes in a bath of glycerine, water, and alum; hang up and dry.

T. E. H. Bullen.

THE WELSBACH INCANDESCENT BURNER PATENTS.

[Invention.]

The decision of the German Supreme Court in the invalidity suits against the Welsbach patents, which we referred to in our issue of October 10, is fully dealt with in a long article in the *Vossische Zeitung* of Berlin, from which we extract the following:—

"The Supreme Court says a method for the production of incandescent bodies for incandescent gas burners remains patent property of Dr. A. von Welsbach or his successors in law, this method to be charact rised by four principal features, as follows: (1) There are produced nitrates, sulphates, or equivalent combinations of substances or mixtures of substances; (2) the salts thus formed are dissolved according to patent; (3) the solution is introduced into the tissues designated; (4) the mantles thus produced are transformed by being turned into incandescent bodies according to patent. The main question for the industry now is: Can the German Gas Glow Light Company, the present owner of the patents, restrain its competitors from the further production of incandescent bodies for incandescent gas burners? The question can be answered only as regards certain incandescent bodies. The industry produces and sells only such incandescent bodies as according to our present knowledge combine the highest light-emitting power with the highest power of resistance. In this direction the numerous suits instituted by the German Gas Glow Light Company have been of enlightening influence. The analyses by Fresenius have shown that both the patent owner and all his competitors impregnate the tissues with nitrates of thorium and cerium oxides, and that the mixture with slight deviations consists throughout of 99 per cent. of thorium and 1 per cent. of cerium.

"The reason why all the manufacturers select this mixture is mentioned in the opinion of the Court: It is the mixture which, without dispute, produces the most luminous and the most durable incandescent bodies. Other incandescent bodies which are impregnated with other nitrates, or in which the ratio of thorium and cerium materially differs, cannot compete with the former, and are not in the market for that reason. Apart from the question whether the Court would sustain the patent at all, the interest of all parties concerned was centered upon the point whether the patents would be sustained so that incandescent bodies impregnated with a mixture of thorium and cerium in the ratio of about 99 to 1 would be covered by it. The reason of this is, that all the other features of the Auer patents were really never disputed seriously. But there can be no doubt that all the features mentioned are found in incandescent bodies that are put upon the market by Welsbach's competitors. The dispute was really only whether the mixture of about 99 per cent. of thorium oxide and about 1 per cent. of cerium oxide was covered by the patents. The importance of this question was fully recognised by the Court.

"There were three patents to be considered: the original patent, 39,162, and the additional patents, 41,945 and 74,745. By the last-named patent the mixture is undoubtedly not covered, because the Patent Office limited this patent to the mixture of thorium and uranium oxide, and it is not among the mixtures protected by the original patent. Thus there is but the additional patent 41,945 left, and of this Claims 3 and 5 have here to be considered. In Claim 5 the mixture (99 to 1) is not mentioned plainly, while by Claim 3 there is protected "the use of incandescent bodies produced from oxide of thorium according to the process described in Claim 3 of the original patent." Here only incandescent bodies are referred to that consist of oxide of thorium, while we are interested in those in which oxide of thorium is mixed with a small quantity of oxide of cerium. The Court now explains, and this is the most important point in the opinion, that under the term "thorium oxide" that substance should be understood which was known by that name in 1886, when the patent was applied for. The oxide believed to be pure at that time was, in fact, not absolutely pure, present methods of analytical division not being known then; it was impure. It follows that in case of Claim 3 oxide of thorium should be considered which is not pure, but the question could be raised whether the foreign substance may consist of oxide of cerium. The Court here points to the fact that thorium and cerium occur jointly in minerals, especially in monazite, from which thorium is chiefly obtained to-day; for this reason it can hardly be disputed that there was a slight admixture of cerium oxide in the thorium oxide of 1886. According to authorities cited by both parties, pure oxide of thorium with a slight admixture of oxide of cerium furnishes excellent incandescent bodies. Supposing the so-called pure

oxide of thorium of 1886, that is, the slightly impure article, furnishes the same result, it should be concluded that the protection of Patent 41,945 concerning oxide of thorium should also extend to the mentioned admixture of 1 per cent. of cerium to absolutely pure thorium oxide.

"The hypothetical way of expression is explained by the fact that the definition of the patent claims according to German law is not admissible in invalidity proceedings, but only in infringement suits. It should be noted, however, that the Supreme Court is also the last court of appeal in infringement suits. That all incandescent bodies now put upon the market by other manufacturers infringe upon the Welsbach patent, says our Teutonic contemporary, is the practical meaning of the German Court decision."

PROPERTY IN UNPUBLISHED PHOTOGRAPHS.

It is well known that the preamble to the Fine Arts Copyright Act, 1862, recited that the authors of photographs (amongst other artistic works) had then no copyright therein, and that the Act proceeded to confer such right upon those who complied with its requirements as to registration. The right endured from the making of the photograph until seven years after the death of its author; but it is not, we think, so generally known that, in addition to this statutory copyright, which is based solely upon this Act, authors of photographs have, *until publication*, certain rights or property therein based upon the ancient custom of the common law, and known generally among lawyers as "common-law copyright." Strictly speaking, it is not copyright, for that was defined by Lord Chancellor Cranworth, in 1854, as "being the exclusive right of multiplying copies of a work already published," and is, therefore, as regards photographs, created and governed entirely by the Act of 1862; but this property in unpublished photographs is founded upon the same principles as, and is identical with, the rights of ownership a man possesses in personal effects, such as the clothes upon his back or the furniture in his house; it is absolute and perpetual unless and until it is waived or divested by the owner. The celebrated case of Jefferies *v.* Boosey, which gave us the standing definition of statutory copyright before quoted, also gives us the tersest and most unequivocal statement of the author's possession of this property in unpublished works. The whole matter was thoroughly and finally threshed out before the House of Lords, and, in his judgment, Lord Brougham declares that "the right of the author before publication we may take to be unquestionable; he has the undisputed right to his manuscript, he may withhold or he may communicate it, and, communicating, he may limit the number of persons to whom it is imparted, and impose such restrictions as he pleases upon the use of it; and the fulfilment of the annexed conditions he may proceed to enforce, and for their breach he may claim compensation."

Lord Brougham referred only to manuscripts, but the principle applied, as was pointed out in the same case, to all literary and artistic work; indeed, it had been applied five years before in the leading case of Prince Albert *v.* Strange, where the Court restrained the defendant from attempting to exhibit some drawings and etchings made by the Queen and the Prince Consort, of which a few copies had been struck off on a private press and distributed amongst their friends. It was doubted, however, whether the statement in the preamble of the Act of 1862 did not supersede this common-law property by substituting for it the statutory copyright. Good authorities inclined to the opposite view, and their contention has of recent years received judicial confirmation. Thus it may be taken as settled law that, before publication, the author of a photograph has an absolute property therein, enabling him to do as he pleases with his own, and to prevent any one making any use whatever of it; between making and publication he has, in addition to and co-existent with this property, statutory copyright as provided by the Act of 1862; and, after publication, he has that statutory copyright alone.

The question then naturally arises, What constitutes publication? And the only answer that can be given is but a judicial dictum, the Copyright Acts themselves containing no definition. Publication is stated to be "the making a thing public in any manner in which it is capable of being communicated to the public." This would generally be by offering the thing itself, or copies of it, for sale in such a manner as to make it accessible to all who choose to obtain it, freed from any restrictions imposed by the author, and subject only to the general law of the land. Perhaps we shall get a better notion of the matter by considering briefly what acts have been held not to constitute publication. Communication of a photograph or other artistic work that is partial, restricted, and conditional, for a limited purpose only, is not sufficient, nor is the making of copies for private circulation and their distribution amongst friends and acquaintances. Copies even may be assigned under an express or implied undertaking on the part of the assignee not to publish, without loeing the common-law copyright, though in this connexion it must be remembered that the statutory copyright is irredeemably lost if, when a photographic negative is first sold, there is no agreement in writing granting the right to the buyer or reserving it to the seller. The loan of a photograph for an engraving to be made from it, which engraving is intended to be published, is not publication of the photograph itself, nor is the exhibition of a copy at an Exhibition, similar to that of the Royal Photographic Society. At all such Exhibitions it has been held there is a condition, implied if not expressed, that the public may come to see but not to copy, although this implication may, of course, be negatived by the fact that copying is, indeed, actually allowed. It is better always to do as the Royal Academy does, and expressly forbid copying by a note in the catalogue, which, however, we fail to find in the catalogue of the Pall Mall Exhibition.

The waiver of these rights constitutes a divestive fact, and the thing then becomes public property. The question whether it is or is not of any pecuniary value is immaterial, but there is never, at any time or under any circumstances, any property in immoral, seditious, or blasphemous works. Judging from the correspondence columns of this and other journals, it is of the unpublished and generally unregistered photographs, belonging to amateurs with whom they are acquainted, that unscrupulous editors and others make the most unauthorised use. It is evident that this is often done on the mistaken assumption that non-registration under the Copyright Act saves them from liability; but that this is not so would be quickly shown were they confronted by an action for damages and an injunction founded upon this common-law property.

Ernest J. Richards.

The Inquirer.

**** *In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* Journal *useful and instructive.*

Ammonia in Gelatine Emulsions.—Historicus writes: "Can you, or any of your readers, refer me to the first mention of ammonia in connexion with gelatine emulsion? I have heard its introduction variously ascribed to different individuals, but I should like to learn the truth."

Tectorium.—Colonel O'Hara writes: "In answer to H. P. in Inquirer column, October 23, 1896—'Tectorium'—let him try The New Wire-wove Roofing Co. Direction (used to be), 75A, Queen Victoria-street, London. Material called 'Durotine,' price about 6½*d.* per square foot."

Tectorium.—W. H. Stoneman says: "Referring to 'H. P.'s' query in the Inquirer column of the 23rd ult., *re* 'Tectorium,' if you have not already received replies, the address he wants is the Patent Wire-wove Waterproof Roofing Co. (Allport's patent), 108, Queen Victoria-street, E.C."

Xyloidine.—Ignorance inquires: "What is the difference between xyloidine, celloidine, and pyroxyline? I believe they are all similar substances, but should like to know the difference, and if they possess individually any special features that recommend them in any particular departments of photography. Papyroxyline, I suppose, is pyroxyline made from paper intead of cotton?"

Conversion of Printing Bath.—J. Phillips asks: "Can I in any way utilise a quantity of old silver printing bath that I have no longer any use for as a bath for negatives (wet process)? I have tried it for the purpose in its present state, but can get nothing but fog."—The thing can be done, but we leave it to our readers to suggest the most economical and convenient plan. Our own suggestion is, Send the old bath to the refiner's.

Metabisulphite of Potash.—Process says: "Will any of your chemical readers give me the relative quantity of alkali to be added to this salt in order to exactly neutralise it for developing purposes? That is, how much alkali must be added to bring the solution into the same condition as if the neutral sulphite had been used in making it up? As it is, the use of metabisulphite is very confusing unless you stick to a fixed developer and trust to Providence."

Cleaning Glass.—In reply to "Young Amateur," J. Robson writes: "I have found nothing better for the purpose of cleaning for *all* purposes than Brooks's soap. A soft rag rolled into a pad, well wetted and rubbed on a block of the soap, and then applied vigorously to the glass, will remove not only all grease and chemical impurities, but also particles of film, either gelatine or collodion, if the plate has been previously used. It then only remains to rinse the glass thoroughly in hot water for preference, to dry with a clean linen cloth, and polish in the usual way. If a plate cleaned in this manner is good enough for the wet process, I think it ought to do for opalines. If not, the operator had better look in some other direction for his failure."

HYDRIODATE OF POTASH.—SENEX, in reply to "Novice," says: "This term is a survival of the old nomenclature, under which the haloid salts were known as 'hydriodates,' 'hydrobromates,' and 'hydrochlorates,' or 'muriates,' instead of, as now, 'iodides,' 'bromides,' and 'chlorides.' There does not seem to be any good reason why these names should have been dropped, since the corresponding names of the acids have been retained, although it is true the salts contain no hydrogen."

WOODEN BATH.—WET PLATE writes: "Will any of your readers, who may have had experience with wooden baths for silver solutions, give me their opinion on the relative value of the following different methods of waterproofing: (1) Shellac (*a*) in the form of varnish, (*b*) spread with a hot iron; (2) Paraffin wax, and how best applied; (3) Lining with ordinary glass, and how best to cement the lining? I shall be very glad of any practical information as the bath I am constructing is of large size, and I do not want to make a failure."

THE ACTION OF ALUM ON GELATINE.—C. E. F. writes: "I see in last week's columns a query on the subject of the difference in action between ordinary and chrome alum. As I understand it, ordinary alum, when added to gelatine in solution, precipitates it, however small a quantity may be added; whereas, chrome alum may be, and is, added to gelatine solutions and emulsions in considerable quantity without causing precipitation or coagulation, but the gelatine when once set cannot be remelted. From this I take it that the action of ordinary alum is immediate, that is to say, that, when applied to a gelatine film in sufficiently strong solution, it at once renders it insoluble; whereas, in the case of chrome alum, the full action is not performed until the film has been dried. Ordinary alum would appear to be the better for use on films, chrome alum in emulsion, and so, I believe, they are usually employed."

CARBON PRINTING QUERY.—EMULSION says: "Your correspondent, J. E. Behrend appears to be dreaming of *Utopia*. I don't know whether he has had any experience in emulsion making; but, if he has, he must know that it is sometimes trouble enough to get a decent emulsion when only gelatine, silver, and bromide are used. What must be the added trouble, then, if we throw in a handful of finely powdered soot or lampblack, or any other colouring matter? I don't mean to say it is impossible to so combine colouring matter with an emulsion without spoiling the properties of the latter; but where is the use? The light could not penetrate into such a film to a sufficient depth to form a satisfactory image unless the exposure were enormously prolonged, and then it is questionable if the result would be anywhere within measurable distance of ordinary carbon printing."

STAINED GELATINE NEGATIVES.—EDGAR BULLARD writes: "In reply to 'Phœnix,' I was for a long time troubled in the same way as himself, as I do all my printing in the open air, and was constantly getting negatives wet and stained. No matter what preventive means were taken, the stains always appeared after exposure to light, until one day I took the opportunity, whilst it was wet, of intensifying a negative that was rather deficient in force, and it was the only one that did not subsequently show the stain. This gave me the hint. Of course, it is not all negatives that will bear mercurial intensification; but where such is not the case, if they are bleached with chloride of copper, very thoroughly washed, and redeveloped with pyro, or any other developer, as may be preferred, the original image is restored without any fear of the stain reappearing. Of course, this treatment must be applied after the preliminary course of salting and fixing, and before any stain has shown."

Our Editorial Table.

LUMIÈRE'S ORTHOCHROMATIC PLATES.

Fuerst Bros., 17, Philpot-lane.

WE have been favoured with a sample of the B series of these plates, which are sensitised for yellow and red. Our test was somewhat severe, and included the purple and blue tints of some black grapes, red and yellow tints of the fading foliage, and some bright reds of the flowers of the geranium and fuchsia, and the berries of the mountain ash. The exposures were made through a screen of pale yellow glass, and the results fully equalled our expectations. The plates exhibited considerable sensitiveness for red and yellow, and should be of great value to those enaged in orthochromatic work. The grain is fine, and the emulsion is very clean and free from fog. Instead of the formulæ recommended by Messrs. Lumière, we used pyro and carbonate of potash, and obtained images of remarkable vigour and gradation. We understand these plates are especially suitable for radiography.

CATALOGUES RECEIVED.

Gibson & Son, King-street, Nottingham.

BROMIDE enlargements on paper and opal, carbon enlargements, and finishing in oils on paper or opal, are among the specialities of Messrs. Gibson, whose prices appear to be reasonable.

Holmes Bros., 24, Southall-street, Manchester.

MESSRS. HOLMES, formerly known as Holmes, Sadler, & Holmes, have sent us a copy of their catalogue of photographic materials, specialities, &c. It extends to 167 pages, and is well printed and got up. A glance through its pages indicates that an enormous variety of photographic goods are listed. The catalogue appeals to photographers, dealers, and the trade generally.

J. C. Drummond & Co., 14, Henrietta-street, Covent Garden.

MESSRS. DRUMMOND'S specialities are photogravure, collotype, line and half tone, platinotype and carbon printing. Accompanying their list are some admirable specimens of line and half-tone work.

The British Photographic Company, New Walk, Leicester.

THIS Company's list gives the prices, which appear to be moderate, for enlarging, finishing, developing, retouching, printing, mounting spotting, &c.

News and Notes.

A TEST.—Mr. Hojack: "Miss Tenspot must be surpassingly beautiful." Mr. Tomdik: "Indeed! What makes you think so?" "She looks well even in an amateur photograph."—*Life.*

PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, November 11. Members' Open Night.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, November 10, the Gallery, 5A, Pall Mall East, at eight p.m. *A New Form of Apparatus for Measuring the Light reflected from Prints*, by Mr. Chapman Jones; *A Theory of the Röntgen Phenomena*, by Mr. Charles E. Benham.

OXFORD CAMERA CLUB.—The Third Annual Exhibition will be held on Thursday, November 12, 1896, in the Holywell Music Room, at 2.10 p.m. Various exhibits will be shown, including the X rays, the acetylene light, &c. Tha lantern slides sent in for competition, and others, will be exhibited on the screen at eight p.m.

WEYMOUTH AND DISTRICT CAMERA CLUB.—The Second Annual Exhibition of Photographs will be held on January 14 and 15, 1897, in the Public Library, Weymouth. Seven silver medals, seven bronze medals, and nine certificates of merit are offered for competition among photographers in Somerset, Devon, Cornwall, Dorset, and Hants. The Hon. Secretary is Mr. E. C. Bennett, 10, Newberry Terrace, Weymouth.

THE WOOLWICH PHOTOGRAPHIC SOCIETY'S TECHNICAL LECTURES.—The Hon. Secretary (Mr. F. W. Machen) writes: "The idea of having a series of connected lectures delivered by a specialist was commenced by us last winter, when Mr. Gear gave our members and other friends in the district instruction in the technical side of photography. These proved a great success, and were attended by large audiences. We felt that instruction in the art of picture-making naturally followed, and we have secured Mr. Lambert to carry it out. He has delivered his first lecture, which was much enjoyed."

THE SALE OF RAT POISON.—At Bow County Court, last week, before Judge French, Robert Potton, a seaman, the branch secretary of the National Seamen and Firemen's Union, was summoned by the Council of the Pharmaceutical Society, that he, not being a registered chemist, did sell a packet of "Hammond's Remedy for Killing Vermin," at 29, Tidal-basin-road.—Mr. Grey, who prosecuted, said that this was a very serious matter. The vermin killer, when analysed, was found to contain enough arsenic to poison 150 people. A number of children had been poisoned by rat poison containing arsenic, in the neighbourhood, during the past few months, and it was difficult to find where it came from. He pressed for the full penalty of 5*l.*—Judge French (to defendant): What do you say? are you a chemist?—The Defendant: I ain't no chemist. I'm a working man. I am the branch secretary of the Union. Mr. Gibbs, who makes this rat cake, used to have offices at the Union-building. A lot of letters came for him, and I gave them to him to oblige. One day a gentleman I thought was the manager of large works called. He said he wanted 2*s.* worth of the poison. I asked Mr. Gibbs for it. He called again, gave me 2*s.*, and I gave up the money to Mr. Gibbs.—Judge French: Did you have any of the 2*s.*?—The Defendant: Not a penny.—Judge French: How do you make him liable?—Mr. Grey: The Act says we must go for the

person who actually sells it.—Judge French: Why not go for the man Gibbs? He is really the guilty person. If you had made proper inquiries, surely you would not have gone against this poor man?—Mr. Grey: The Act does not allow us.—Judge French: Then it is a bad Act. It is your own Act; the sooner you get it amended the better. Are you going to press for the full penalty?—Mr. Grey: I am afraid we must.—Judge French: You are liable.—The Defendant: I can't see I am.—Judge French: Their Act says so. Have you a family?—The Defendant: My wages are 30s. a week. I have a wife and four children.—Judge French: Do you press for the full 5l.?—Mr. Grey: I do.—Judge French (sharply): Then I order him to pay the 5l. and costs at the rate of 1s. a month. That will take over eight years for him to pay.—(Laughter.)—Mr. Grey: I must, in the public safety, ask for a larger order. This will have a very bad effect.—Judge French: And it is still worse effect to take proceedings against a man who was not in the habit of selling the poison, and only gave it out on one occasion to oblige a neighbour, as he thought.

Patent News.

The following applications for Patents were made between October 21 and 28, 1896:—

Dark Slides.—No. 23,132. "Improvements in Dark Slides for Photographic Plates." A. E. Hopkins.

Development without Dark Room.—No. 23,232. "New Arrangement and Dark-slight for Development of Exposed Photographic Plates by Day or or other Common Light without Dark Room." E. Klupathy.

Screen Kinetoscopy.—No. 23,279. "Improvements in Apparatus for Taking and Projecting Animated Photographs." E. B. J. Hunebelle.

Mounts.—No. 23,507. "An Improved Mode or Method of Uniting Paper to a Cardboard or other Support particularly Applicable to the Art of Manufacturing Photographic Mounts." Complete specification. J. W. McCabe.

Retouching Desk.—No. 23,547. "An Artificial Light Retouching Desk." A. McNab.

Photographic Lamp.—No. 23,683. "Improved Lamp or Lantern for Photographic Purposes." H. G. Moberly.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
9	Bradford	*How to Make a Set of Lantern Slides.* George Thistlethwaite.
9	Camera Club	*The Interior of Iceland.* Captain J. H. Thomson, R.A.
9	Ealing	*Exposing.* Roland Whiting.
9	North Middlesex	*The Spectroscope.* E. J. Wall, F.R.P.S.
9	Nottingham	*Treatment of Figures.* Rev. F. C. Lambert, M.A.
9	Richmond	Lantern Evening, Prize Slides.
9	Stafford Y.M.C.A.	Lantern Evening, Members' Slides.
10	Birmingham Photo. Society	*Three Legs in a Boat.* H. E. Perry.
10	Hackney	*Enlarging.* J. A. Hodges.
10	Royal Photographic Society	*A New Form of Apparatus for Measuring the Light Reflected from Prints.* Chapman Jones. *A Theory of the Röntgen Phenomena.* Charles E. Benham.
11	Ashton-under-Lyne	Discussion: *Faults in Negatives and Prints.*
11	Borough Polytechnic	Conversation Night.
11	Croydon Camera Club	First Public Lantern Show of the Season.
11	Leeds Camera Club	Annual Dinner.
11	Leytonstone	Practical Demonstration on Lantern-slide Making. F. W. Wates.
11	Photographic Club	Members' Open Night.
11	Southport	*Lantern-slide Making.* J. A. Hodges, F.R.P.S.
11	Woolwich Photo. Society	*The Theory and Practice of Art Photography.*—II. F. C. Lambert, M.A.
12	Camera Club	*English Regalia and Coronation Ceremonies.* Cyril Davenport, F.S.A.
12	Darwen	Platinum Toning Demonstration. J. Fielden.
12	London and Provincial	*Backing Plates.* A. Haddon.
12	Manchester Photo. Society	*Acetylene Gas.* H. M. Whitefield.—*Wellington & Ward's Negative Paper.* A. E. Casson and Harry Wade.
12	West Surrey	Acetylene Gas, with Demonstration.
13	Croydon Microscopical	Trial Night, Members' Slides.
13	Ireland	*Notes from the two London Photographic Exhibitions of 1896.* Geo. Mansfield.—*The Basque Provinces of Spain.* V. E. Smyth and J. R. Brown.
13	Plymouth	Members' Lantern Evening.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

October 29,—Mr. E. J. Wall in the chair.

The Chairman formally introduced, with a short speech, Mr. Paul Martin, who has attracted some amount of attention recently by his series of pictures, *London by Night.*

Mr. T. E. H. Bullen read a paper on

Flexible Films [see p. 711].

Mr. Bedding inquired whether the new film would stand any degree of heat—that of a warm climate, for instance?

Mr. Mackie asked the object of coating the film on both sides.

Mr. Everitt felt bound to say that a film like that under consideration would be a great boon if it could be placed on the market at the same price as glass plates. One advantage of a film like this, coated on both sides, although, perhaps, for another purpose, was that one had an opportunity of printing either way.

Mr. James inquired what was the limit in the size at which the film would keep flat?

Mr. Sinclair said it appeared to be a very promising film. There was no difficulty in getting a slow film to give good technical excellence, but he had found the reverse in getting a rapid film that would keep. His recent experience with plates and films exposed indiscriminately had set him against films, finding, as he did, on development, that, while the plates were good, the films were totally useless. It was important to get a film with better keeping qualities, and one the material of which had no effect on the emulsion.

Mr. Beckett hoped they would not split. He had found on one occasion, after developing a dozen films, that two dozen were in the dish. He had also found them very erratic, and, though theoretically they did not lose sensitiveness, if they were not developed soon after exposure, they often lost the image.

Mr. Teape had been greatly troubled with dark, almost opaque, spots.

Mr. Bullen, replying to these and other remarks, said he could see no good reason why the films should not stand a warm climate as well as any sensitive plate. Mr. Banks told him they would stand a temperature of 150°. In reply to Mr. Hodd, he had not found that alcohol had any influence on the films. With reference to some remarks on various faults in the specimens, he reminded the meeting that these specimens were not made from the perfect commercial films, but from those in the experimental stage, and it was easily understood that an unfiltered emulsion would account for the roughness discovered by Mr. James. As to the price of the finished films commercially, he said there were no expensive solvents used in their manufacture, and consequently there was no reason for a high price. The largest size that had been made was four and a half feet by twenty inches, and this remained perfectly flat. In reply to Mr. Mackie, he thought the flatness presented by the film was sufficient explanation for coating on both sides. There was equal tension on either side, and so the film remained flat. He could not answer for their keeping qualities yet from experience, sufficient time not having elapsed since their origination. He would say, however, that there was certainly nothing used in their manufacture that should have any ill effect on a sensitive silver salt. Replying to a remark by Mr. French, he said the films should not stick to gelatine papers any more than other types of negative.

The Chairman said they were indebted to Mr. Bullen for a very good historical sketch of film-making, and for some extremely promising specimens. How long would this film take to dry?

Mr. Bullen said that, as two surfaces were exposed, they took no longer to dry than a single surface. The body of the film was not affected by water, and the surfaces only had to be dried.

PHOTOGRAPHIC CLUB

October 28,—Mr. Snowden Ward in the chair.

Mr. Burrage was proposed as a member of the Club.

Mr. Welford introduced Mr. Liesegang, a son of Dr. Liesegang, of Düsseldorf.

Mr. D. Hill presented to the Club library a copy of Puyo's *Notes sur la Photographie Artistique.*

Dr. Chartens White delivered a lecture upon

Switzerland,

illustrated with a series of lantern slides, mainly from his own negatives. Mr. White took his audience through some of the most interesting scenery and towns of the country, and described his adventures with characteristic humour. He was heartily thanked for a very interesting evening's entertainment.

Amherst Club Photographic Society.—This Society was started on Wednesday evening, October 28, when the first General Meeting was held at the Amherst Club, West Hackney. The names of gentlemen desirous of joining were taken, and the rules agreed upon. Mr. C. C. Paine was elected President, and Mr. Walter Potter Vice-President, Mr. E. M. Groundwater being appointed Treasurer, and Mr. J. Douglas Hon. Secretary. Meetings are to be held on the second and fourth Wednesdays in each month at the Club house, where the Society has most luxurious rooms for its meetings, and is having a capital dark room, fully equipped and furnished, provided by the President, free of expense to the Society.

Croydon Camera Club.—The meeting on the 28th ult. was a Lantern Night. There was a crowded gathering at the Club-rooms to inspect slides shown by Messrs. Richardson, Myrtle, Underhill, G. W. Jenkins, Taylor, Costar, A. J. Noaks, Holland, Isaac, Platts, Elkin, Lock, Kough, Allbright, and Rogers. The best of the above, which illustrate the festivities and procession in connexion with the visit of the Prince and Princess of Wales, and an admirable series of the interior views of the Municipal Buildings, will be selected for display at the public lantern show, to be held on the 11th inst. In the course of the evening the President (Mr. Hector Maclean) referred to a newly invented camera and projection apparatus, called The Grand Kinematograph, which had just been perfected by the firm of which their member, Mr. Victor Bender, was one of the leading partners, viz., Messrs. Bender & Co., of Croydon. The apparatus in question was in many ways a great advance upon those machines hitherto shown; the negatives were double the size of any

other camera of the class; the vibration was much reduced, as also were the noise and clatter which usually accompany the projecting apparatus when in action. The President was also able to announce that, by the kindness of Messrs. Bender & Co., Mr. Adolph Langfier had promised to show the Grand Kinematograph in action at the Lantern Show of the Club, to be held on January 13, 1897.

Hackney Photographic Society.—October 27, Mr. W. Rawlings presiding — Mr. Dunkley showed results produced by placing two spectacle lenses in front of a single landscape lens of five and a half inches focus, thereby increasing the focus of the lens to eight and a half inches. The Rev. F. C. LAMBERT spoke strongly in favour of using non-achromatic lenses for portraiture, the non-coincidence of the visual and chemical foci giving a soft, harmonious image. A paper on

INTENSIFICATION AND REDUCTION,

by Mr. T. Bolas, was read by Mr A. BARKER. Slides were shown on the lantern screen to illustrate the relative degrees of intensification produced by the various formulæ. A discussion on the subject of the paper and of the after-treatment of negatives in general took place. Mr. GRANT repeated his advice given at a previous meeting, that, instead of using an intensifier, it was a good method to make a positive transparency from the negative, work up the transparency, if necessary, with pencil stump, and then make another negative from it. Mr. HENSLER thought that a certain amount of detail was lost in copying. The Rev. F. C. LAMBERT agreed, but thought that it might be of advantage in some cases. Personally, on the question of working up or "faking," he had no objection to it whatever. The object was to get an effective picture, and the end justified the means. In the course of the discussion, a point was raised as to length of time necessary to wash negatives after fixing. A certain amount of difference of opinion was revealed, some being for long washing, others for short; but it was finally pointed out that the effectiveness of the operation depended not so much on the duration of the washing as in the manner of it, a few minutes under the tap being better than prolonged soaking. The Rev. F. C. LAMBERT thought that thorough fixation was of more importance than the after-washing, and for this reason it was desirable to use a supplementary fixing bath.

Richmond Camera Club.—On the 26th ult., Mr. F. P. Cembrano in the chair, Mr. ALFRED WATKINS gave a lecture on

SYSTEMATIC DEVELOPMENT.

He pointed out that, an exposure having been given, the various tones of a negative appeared in a settled ratio, and there is very little power of altering the ratio by development; also that the density of the various tones was built up as development proceeded in a ratio which progressed by definite rules, and could not be altered by modification of developer (fog and a limited power by variation in bromide excepted); that variations in the amount of developing agent or alkali merely altered the speed of development, although a strong pyro developer attains density in a quicker ratio after appearance than a weak pyro developer. In the case of variation in amount of bromide, a certain alteration of gradation was shown in some cases; but, to gain full effect, the alteration should be from commencement. The uselessness of previous soaking in alkali or in pyro and bromide was illustrated, and also the fact that such widely different developers as metol and hydroquinone gave exactly the same result if carried to the same stage. Great emphasis was laid on the power of altering gradation by length of development, the same exposure, giving soft, plucky, and hard results, being shown on the screen. The power of control for variations of exposure by mere length of development was illustrated, prints from exposures of half to sixty-four seconds, developed together in one dish for times indicated by the Eikronometer method, all showing much the same gradation. The difficulty of judging stage of development by looking through the negative was alluded to. The lecturer advocated the control of results by timing only, the basis being the time of first appearance of the image, a given multiple (according to developer used) of this time being given. Thus, Ilford pyro soda (the weaker formula) requires about six and a half times the appearance of the image. The timing could be done by watch, but the Eikronometer, a specially designed clock for the purpose, was much more convenient. The lecture was fully illustrated by lantern slides.

Bradford Photographic Society.—On October 26, Mr. Walter Booth (Vice-President) lectured before the members of this Society on the platinotype process, and treated the subject in a very lucid and instructive manner. As the lecture was specially prepared for beginners, the lecturer began his discourse by explaining the nature and special properties of platinum, which made it one of the most desirable materials for photographic printing. He gave a short sketch of the various discoveries in connexion with the process, and explained the why and wherefore of the calcium tube, and gave details of a good system of gauging the exposures. The demonstrator then developed prints on various papers, gave formulæ for blue back, warm black, sepia, blue, and other colours, by development only, and particularly recommended the thick papers, both rough and smooth, of the Autotype Company, and the c. c. of the Platinotype Company. Mr. Booth had numerous examples of his own work in platinotype on various grades of paper, and the series of architectural studies he showed were much admired, these efforts alone being sufficient to at once stamp him as a worker of the most advanced school, his pictures displaying not only excellent technique, but a thorough knowledge of the elementary principles of art.

Leeds Camera Club.—The third of a series of elementary lectures for beginners was given by Mr. A. Gaunt, on Wednesday evening last, at the Club's rooms, Grand Restaurant, Boar-lane, the subject taken being

PRINTING.

Mr. GAUNT confined his remarks to those printing processes that come within the range of a beginner's efforts, and in the course of his lecture he threw out a few useful hints as to the preparation and treatment of the negative before and during printing, explaining his method of "blocking out" (using a fine drawing pen and Chinese ink for outlining), printing in skies, &c. At the close Mr. Gaunt answered a number of questions, and an interesting discussion followed on the relative merits of albumenised *versus* gelatino-chloride papers, which eventually led to a challenge by the lecturer, which was promptly accepted by a member present, and eventually two other contests were arranged, the decisions to be given at some future meeting. Notice was given by the SECRETARY of the postponement of the Annual Dinner to November 11, to suit the convenience of several members interested in the municipal elections. The dinner will be held at the Grand Restaurant, followed by a smoking concert. Stockwell's patent single lantern for dissolving effects was exhibited and described by its inventor—a member of the Leeds Camera Club—and elicited great praise from all lanternists present. A demonstration is to be made with it on November 18, when all interested in lantern work are cordially invited to be present.

Newcastle-on-Tyne and Northern Counties' Photographic Association.—October 27, Annual Meeting, Mr. J. P. Gibson (the retiring President) occupying the chair.—Mr. JAMES BROWN (Hon. Secretary) read his report, which stated that the Association had had a successful year. The membership on October 1 stood at 109—a decrease upon the previous year's figures—but new members continued to be enrolled. The indoor meetings had been very well attended, but the outdoor meetings had been practically failures. Mr. Fred Park (Hon. Treasurer) reported a balance of 15*l.* 8*s.* 10*d.*, as against 3*l.* 19*s.* 8*d.* at the beginning of the year. The election of officers resulted as follows:—*President:* Mr W. Parry.—*Vice-Presidents:* Messrs. J. S. Bell, J. P. Gibson, J. Hedley Robinson, and John Watson.—*Council:* Dr. Blacklock, Messrs. W. E. Cowan, J. E. Goold, William Graham, George Hall, J. J. Kirkwood, Edgar G. Lee, T. O. Mawson, Captain Sayers, and Mr. G. L. Snowball.—*Hon. Treasurer:* Mr. Fred Park.—*Hon. Secretary:* Mr. James Brown.—*Assistant Hon. Secretary:* Mr. Parker Brewis. Awards in the members' competition were announced as follows:—Landscape: silver medal, Mr. James Brown; bronze medal, Dr. Smith. Marine and instantaneous: silver medal, Mr. James Brown. Portraiture: bronze medal, Mr. Burton Graham. Hand-camera work: bronze medal, Captain Sayers. Lantern slides: silver medal, Mr. W. Errington Cowan. Enlargements: silver medal, Mr. Burton Graham. In all, seventy-eight sets were submitted, which contained much meritorious work. Messrs. W. Milburn, President of the Sunderland Society, and J. Blain Scott, of Carlisle, acted as Judges.

Oxford Camera Club.—October 28, Colonel Impey in the chair.—The SECRETARIES gave further information as to the arrangements for the Club Exhibition on November 12, stating that there would this year be no restriction on the sale of tickets. The competition slides would be shown at eight o'clock. A lecture on

THE TREATMENT OF FIGURES,

by the Rev. F. C. LAMBERT, was then read, and illustrated by lantern slides. The members were invited to add their criticisms to those of the lecturer, and some points of general interest were brought out. It was announced that it was proposed to hold an examination at the end of the season on the subject of these lectures, and there would be prizes for the best papers. A vote of thanks to Mr. Joyce for lending and working the lantern closed the proceedings.

FORTHCOMING EXHIBITIONS.

1896.	
Nov. 6, 7	Photographic Salon, Dudley Gallery, Piccadilly. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 6–12	Royal Photographic Society. R. Child Bayley, 12, Hanover-square.
,, 12	Dulwich Photographic Society.
,, 12	Oxford Camera Club.
,, 17–20	Hackney Photographic Society. W. F. Fentoo-Jones, 12, King Edward Road, Hackney.
,, 26, 27	Romford and District Photographic Society. A. John Ormiston, 4, Laurie-square, Romford.
,, 30-Dec. 1, 2 ...	North Middlesex Photographic Society.
December 3, 4.....	Aintree Photographic Society. E. P. Heron, 2 Tilney-street, Orrell Park, Aintree, Liverpool.
,, 28-31	Borough Polytechnic Photographic Society. P. C. Cornford, 103, Borough-road, S.E.
Dec. 1896–Jan. 1897	Bristol International. Hon. Secretary, 20, Berkeley-square, Clifton, Bristol.
1897.	
January 14, 15	Weymouth and District Camera Club. E. C. Bennett 10, Newberry-terrace, Weymouth.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

ORTHOCHROMATIC PLATES WITHOUT A SCREEN.

To the EDITORS.

GENTLEMEN,—In the final paragraph of an article by Mr. W. K. Burton, in your last issue, reference is made to an old suggestion of mine in the direction of rendering orthochromatic plates altogether independent of a coloured screen, when the maximum effect is desired.

Speaking from memory, however, I do not think I ever proposed a separate coating of coloured collodion, which would present other difficulties besides that of expense. My proposal, I think, was to take

an emulsion properly colour-sensitised in the ordinary way—that is to say, with the sensitising matter chemically combined with the silver salt—and to mechanically stain either the emulsion or the film with a suitable dye to produce the desired effect. The effect of dyeing the film of dry plates was shown, years ago, to have the effect of lowering the general sensitiveness in pretty well the same manner as a coloured screen used with an ordinary plate would act by reducing the action of the blue and violet rays. If, however, a film specially sensitised for any particular class of rays were so treated with a proper dye, it seems to me that, while the more active rays would be considerably weakened in their action, those specially sensitised would not be proportionately so. In a few experiments, made at the time with collodion emulsion, I found such to be the case, but did not follow them out. Of course, it must be understood that the dye used to replace the screen must have no chemical action on the film itself or its constituents.—I am, yours, &c.,

W. B. Bolton.

THE BANKSIAN THEORY OF DEVELOPMENT.

To the Editors.

Gentlemen,—Whilst admiring the clever reasoning of Mr. Banks's paper—published by you on p. 677—I cannot help feeling a little regret that he did not give a summary of the researches and writings of others, so that we might have gained a better idea of the novelty, or otherwise, of his results, which hardly seems to have been called in question at all by those present at the meeting.

The idea of a rearrangement of the molecules of the silver salt is by no means new, as it was suggested by Davanne in 1857, and the first, or one of the first to suggest an electrical action was Marié Davy in his work *Hauptinhalt der Untersuchungen über die Elektricität*, a little-known, if not quite forgotten work, published, I believe, in 1860.

Cherrill, in 1867, suggested that the action of light was to polarise the silver haloid, and the metallic pole was turned in the direction whence the light came.

W. B Bolton published in The British Journal of Photography, 1870, p. 397, a paper supporting the electrical theory, and stated that he believed that the action of light was not chemical but electrical, and that the latent image was formed of molecules which were in a state of electrical excitation; and that in the case of the collodion plate with acid silver development, the metallic silver was electrically attracted in *statu nascendi*, and in the case of alkaline development the decomposition of the molecule was produced by the hydrogen set free in the developer.—I am, yours, &c.,

A. D. Pretzl.

ACETYLENE.

To the Editors.

Gentlemen,—I see in your last issue that Mr. Chapman Jones, whom most of your readers would consider an authority, considered there was little or no danger in using acetylene with brass or copper fittings. Having had a considerable experience with acetylene, may I venture to warn your readers that copper, or alloys containing copper, are *highly dangerous* with acetylene?

In the course of a long series of experiments, having found no apparent action, I was using copper connecting pipes and brass fittings, when one day, without any warning, one of these pipes fired with a brilliant flash and loud report. An examination of the fittings afterwards showed that all of them were very badly eaten away from the inside; but a still more important point was, that the whole of the generator was thickly coated with soot, and very hot, the ignition of the copper and brass fittings having evidently caused a decomposition of the gas itself. Fortunately my generator, being an ordinary steel compressed gas cylinder, was able to withstand the force of the explosion, else the result must have been disastrous. Mr. C. Jones says, "doubtless, it sometimes arose with *corroded* metal." Will he and your readers please note that the above occurred with bright, new, copper tubes and brass fittings, *which had never been used before!*

It may perhaps be news to your readers, as I have not seen it mentioned before, that acetylene gas generated from carbide of calcium *is not pure*. In the course of my investigations I found it to contain compounds of sulphur and phosphorus. I made several estimations of the sulphuretted hydrogen, and found it present to the extent of 1½ per cent. in volume, the actual average being 413 grains of sulphur in the form of sulphuretted hydrogen per 100 cubic feet of the gas! This figure may be better appreciated when you consider that ordinary coal gas in London has to be *absolutely free* from sulphuretted hydrogen, and the total sulphur present seldom exceeds 15 grains per 100 cubic feet. Perhaps, however, the most serious impurity is the phosphorus, which is present in the form of hydrides. One of the hydrides of phosphorus (phosphorous dihydride) which is nearly always produced with the other hydrides, has a very unpleasant property, in that it renders other gases *spontaneously* inflammable. Possibly it is the presence of these impurities in a greater or less quantity which brings about the apparent uncertainty of acetylene made from carbide. Certainly it can never be safe with phosphides present.—I am, yours, &c., A. E. Knowles.

The Birmingham Oxygen Co., Ltd., Saltley Works, Birmingham, October 30, 1896.

P.S.—I ought to add that silver (as would occur with plated fittings) is still more dangerous than copper. Acetylide of silver is terribly explosive. I have been unable to dry it, as it has always exploded spontaneously. It will explode with the slightest touch *under water!*

PHOTOGRAPHY IN NATURAL COLOURS.

To the Editors.

Gentlemen,—I have read the article on *Single Transparencies in Natural Colours* (p. 674), and I should like to make a few remarks:—

The method therein described of producing transparencies in colour in no way resembles my own, which are as easy and certain to produce as an ordinary silver print, and, as far as I have been able to prove, are absolutely permanent; and I do not think it possible for pictures produced in aniline dyes to possess that important property. The method you describe I worked out five years ago while engaged in the management of a well-known studio in Dublin, and was discarded by me in consequence of serious defects and difficulties. I have before me as I write my "notes and experiments" for that period, and I will reproduce some of them here. Under the heading of "Notes, March 3, 1891," are the following experiments, which I reproduce as they are entered:—

No. 2. Try the effect of power and gradation of aniline dyes (3*), red, yellow, and blue, as compared in the same manner with artists' pigments.

No. 3.* A gelatine plate sensitised with bichromate of potash—print and try the *absorption* of same with *dyes*.

No. 4. Same, and try dusting on powder colour.

No. 5. Transparencies developed with pyro, or hydroquinone, afterwards converted into red, yellow, and blue, these to be upon *celluloid*.

No. 8. Make from the test screen negative of three colours three prints in carbon in identically the same colours (red, blue, yellow); develop the first upon glass, the next two upon celluloid, and transfer accurately upon the first.

The above experiments were all carried out in one *day*, the materials having been previously prepared. No. 3 was afterwards carried out with celluloid, but I did not trouble to join up the films with balsam or other adhesive, as the method has serious defects which I will point out: there is great difficulty in getting perfect gradation in a plain film of gelatine by development with hot water, as the light in printing has a spreading action, and frequently renders the film insoluble right through; but a much greater defect is due to the actual image caused by the bichromate, which is of a brown colour. Now, if you take three such images as produced by Mr. Ives upon celluloid and without immersing in any dye whatever, you will find that, upon joining them up, you will have a brown positive of considerable vigour, and which, when coloured with the dyes, entirely destroy the truth of the original colours, a disagreeable monochrome running throughout the whole picture. The same defects are met with in making carbon prints as described in my No. 8 experiment, the brown image of the bichromate spoiling the purity of the colours. The above and similar methods were carefully tested and abandoned by me in 1891, and since that time I have succeeded perfectly upon different principles. I have not seen Mr. Ives's results, but it would be impossible by such a method to produce such gradation, purity of colour and detail, as my pictures possess. As to when I shall make known my method, I reserve to myself the right to do so, at what time and in what manner I feel disposed. I have a jewel, and may surely decide its setting before it leaves my hands; and, if another method should yet be found, I am not afraid of the issue of my own.

During the years I have been working at this problem I have occasionally been startled with statements and announcements in different journals to the effect that the problem of colour photography has been solved; but, while I yield all honour to Lippmann for the interferential method and to Ives for his photo-chromoscope, I still possess my soul in peace, and not even the exquisite pleasantries and sarcasm of "Cosmos" disturb me from the even tenour of my way.—I am, yours, &c.,

Wallace Bennetto.

The Studio, Newquay, Cornwall, October 27, 1896.

THE TRAILL TAYLOR MEMORIAL.

To the Editors.

Gentlemen,—A Meeting of the General Committee of this Fund will be held at the Exhibition Gallery, 5A, Pall Mall East, on Friday, the 6th inst., at 7 30 p.m., to receive the report of the executive committee.

All subscribers to the fund are invited to attend.—I am, yours, &c.,

Alexander Mackie,

Hon. Secretary to the Fund.

SCREEN NEGATIVES DIRECT FROM NATURE.

To the Editors.

Gentlemen,—I see in your issue of Friday, October 22, a very full

report of a paper on the above subject read at a recent meeting of the Royal Photographic Society by Mr. Gamble.

It is but very little that can be done in the way of photographing direct from nature with the cross-line screen for various reasons, but especially on account of the smallness of the latitude permissible in the use of diaphragms. Something may, doubtless, be done in the house in the way of photographing statues and suchlike still objects, but the large process camera, with its long-focus lens and ponderous accessories, are far too cumbrous to be dragged about the country for landscape work, and, moreover, the smallest stop which would give proper contrast to the picture would be found too large to give the proper depth of focus for most landscapes, while, on the other hand, the largest stop which could be used with the line screen would be found far too small for successful portrait work. For working direct from nature a different form of screen is absolutely necessary.

The extra rapid screens which I am now making for this purpose, while they can be used in the ordinary way as slow screens with wet plates, admit, when desired, of being used with any intensity of light up to sixty times as much as would be available with a line screen in the same circumstances. The screen negatives from which the enclosed scraps were obtained were all taken from life in the house in a rather poor flat light, with an exposure of *two seconds*, while I was using Ilford Special Rapid or Red Label plates, and an intensity of light equal to about thirty times what I could have got with a line screen. The same thing could have been done with Ordinary Ilford plates with an exposure of from six to eight seconds, and with Ilford process plates in about one minute, the exposure in the last case being much too long for portrait work, but quick enough, certainly, for the still objects and copying purposes. With process plates or wet plates in good condition, about half an hour's exposure would have been required with a line screen. Each of these portraits had about the same amount of detail, and decidedly more pluck and roundness than ordinary photographs taken in in the same circumstances without the screen. For this mode of working, any kind of lens that will take a decent photograph, and any kind of camera, will do, and no elaborate calculation is necessary for adjusting the screen. All that is necessary is to lay the surface of the dry plate against the screen, and put both together into a double dark slide, the screen next the lens, and the black cardboard division in behind the plate to keep all tight, and give about four times as long exposure as would be required without the screen. The proper gradation of the picture is secured by the construction of the screen mesh, and the contrast may be modified greatly as desired during development, especially if pyro be used. By this mode of working a process operator could do about three dozen screen negatives in a day, a task which most would find it difficult to perform in a week in the ordinary way, especially in winter. When the time of exposure can be thus reduced to from one to three seconds, I see nothing to prevent portrait photographers from making screen negatives of their sitters direct from life, and furnish them with proofs by the hundred in permanent printing ink. A boundless field for the application of photo-engraving could thus be opened up, and an excellent opportunity afforded to people of filling scrap albums with portraits of their friends.

These rapid screens have also other uses. On account of the intensity of light available, they can be used for transferring the picture to the zinc or copper direct from the original negative, both the ordinary photographic print and screen negative being dispensed with.—I am, yours, &c.,

3, *Waterloo-place, Edinburgh.* A. Mann.

THE PHOTOGRAPHIC SUPPLIES INDUSTRY.

To the Editors.

Gentlemen,—To grasp this subject in its present aspect seems to me an impossible and invidious task, yet, on behalf of a numerous unoffending class of paterfamilias, I am drawn into the whirlpool.

In the early dawn of photography, one had to silver his own plates, make his hypo and his cigar-box camera, and construct his periscopic lens. Timely aid came from Mr. Robert Hunt, of the Royal Cornwall Polytechnic, who first published, through Griffins, of Glasgow, his work on practical photography, and which was then the only available guide in those dark ages, and was wonderfully useful. The fortunate owner of that book, if he compares it with the last number of The British Journal Photographic Almanac, 1896, may ask himself the question, Whence all these thousands of advertisements, and to what cause am I to assign their growth?

Much nonsense has been written about amateurs. Why, in 1840, we were not even qualified for that distinguished title. We were fiddlers or experimentalists; but, all the same, we are the legitimate fathers of that modern prince, if you will, the self-dubbed professional.

In scanning the list of modern photographic advertisements, one is struck by the contrast of 1840 and 1896. In the former we had to grope our way in every direction, and it took both time, brains, and money to coax his Majesty the Sun to become our delineator. Now, alas! for our pride of heart, the great sun himself waits patiently and obediently upon the human figure or the "penny in the slot," and asks for neither brains, time, nor certificate; he makes pictures broadcast by the aid of the dry-plate automatic camera, exposure meter, and self-acting developer, and all the rest of it. What a contrast! Yet (aside), have these picture-makers cause for glorification anything like the sparkling fire that lit up the enthusiasm of a Fox Talbot, Sir John Herschel, or Robert Hunt? I opine not. A German organ-grinder imitating Jenny Lind explains the contrast.

Oh, what a gush rushes to the heart when you tread the virgin soil and forest, and feel that you are the first human visitor! Any one who has had this delightful experience can well understand the emotional twitchings of delight when these pioneers first traversed the unknown regions of the *dark-(room)* ages, and brought forth for the first time mimicries of Nature herself.

Who could have divined that, in a weak moment, our best friend, the sun, would have so given himself away?

The autocrat of the universe has become republican, and one of ourselves; he is subservient to our requirements, and *strikes* not against our wage remuneration! Surely the millennium is in sight!

But to my text. The wants and the luxuries of the would-be photographer, what are they in his various conditions of development, the *embryo*, the *full-feathered*, and egg-laying? They have brought into existence sprucely donned, white-aproned waiters to minister to their craving appetites, and, according to the old law of supply and demand, we have a goodly choice; indeed, to the outsider, a comical one.

Lenses! What is a lens in present-day optical nomenclature? Jena glass, iris diaphragm, anastigmatic, *f*-12–5, Zeiss, *f*-18, aplanatic, group, rectilinear, concentric, baby, instantaneous, and all the rest of them. In glancing over this huge list of lenses, I defy the ordinary intellect to select the best lens for his immediate requirements. This should not be, seeing that we have societies by the hundred, which meet and sit, like so many ambassadors to Turkey, dumb and tongue-tied down either by personal interests or afraid to speak in favour of *one* instrument, lest they should endanger the reputation of a certain maker who has always been very kind. Then we come to the cameras by the thousand, from the Penrose process, the feather weight, the aluminium Zephyr to the Presto, press the button and the stable-boy does the rest. Well, surely there is no rational demand for such a conglomeration of contrivances, except this, that what was formerly understood as human brains has emigrated to Mars or elsewhere, and that these figaries are supplied to fill the vacuum, *vice* the mind, made necessary by promotion of the latter.

Automatic is in the air. We breathe it, digest it, it is the vitality of present-day life. The nature's gentlman spurns the dogma that "*he* must earn his bread by labour." And so he is impelled by desire, all he needs must be prepared ready to his hand, like the prince sportsman, who was driven to the wilds to shoot tigers. Attendants were placed in advance, driving in the animals, and others had a ready supply of guns, cocked triggers, which they handed to the prince at a given signal, and who simply *let fly*. That was newspapered tiger hunting, and the prince was highly beputfed for his "gallant daring in the jungle." Now, this is a true reflex of the modern open-air photographer, who gets his exposures developed and printed by the professional. "But, why," some one will ask, "what are you raving about? Is it not quite right we must have our conveniences to assist us in our work?" Yes, quite right; but you ask to have the work done that you may reap the glory which you filch from the experienced man who *does* the whole work for you. In fact, the nature's gentleman, and, of course, woman, is included, not as it used to be, a matter of dress. Sex doth not now perplex our classification of humanity. The duplex man, therefore, is a creature, a vacant space, ready to be occupied by vapours or substantials, according to his appetite and his tastes.

The circumstances of the moment are the ruling elders in that church, hence we must expect that such an employment as making pictures of nature by auto[]machinery would enanare humanity of every stage of development and progress, causing them to hover around the light after the manner of the midnight moth, who flies around the lamp flame until he is drawn in.

When the young moth gets entangled in the literature of photographic hydrophobia, he appeals to *pater* for a cheque, then to Dr. Photo Supplies for a cure! Oh, to read the diagnosis and the prescription is a proper caution! Another flame is dazzled before the eyes of the patient. A plethora of delights—snap-shot cameras, teetotal stands that always keep their feet, dry plates, open-air studios, changing bags, retouching air brushes, and a thousand other attractions, all dangled before the eyes of the embryo photoist. What is he to do? Bewildered at the extent and reality of his disease, he plunges back to his admiring dad to change the cheque for a much larger amount. Now, this amiable dad nets his cash in a very different trade, yet he feels that he should part with some of it if only to suit the whim of his darling offspring, and so the bigger cheque is drawn, and the photo-supply doctor prescribes accordingly. The patient feels apparently better, but not much wiser. There we have a side light which to those who read may find "a fitting cap." I have no quarrel with those who desire to provide aids and facilities for the legitimate requirements of the photographer; but, when inventors of lenses, cameras, and the thousands of other things, meddle with substitutes for brains, it is full time to put the scientific foot down, and say, *Stop!* lest you turn to nought and annihilate the remaining remnant of *esprit-de-corps* existing among the worthy community of *bond-fide* photographers.—I am, yours, &c.,

Joseph Lewis.

Dublin, October 28, 1896.

SALON-IC ETHICS.

To the EDITORS.

GENTLEMEN,—Your kind insertion of the following may possibly interest your readers, and bring me the satisfaction I have vainly sought at the hands of the Salon's Hon. Secretary.

I sent six pictures to the Salon in response to the usual invitation, three of my own work, and three of my friend's, F. Holland Day, of Boston (whose work I introduced to the Salon last year), these being my own property, and sent by permission of Mr. Day.

I received a rejection notice for two pictures, and sent for them on the appointed day. I found, on attending the Exhibition, that I ought to have received a rejection notice for four pictures, as only two out of the six were hung.

I wrote and asked what had become of the missing two pictures, and why I had had no rejection notice for them. To this I received the reply that I "*had* had a rejection notice, and that I had received the pictures, they being signed for by So-and-So; but, if they were not so received, then they would be at Messrs. Dicksee's, in accordance with the conditions of the entry."

As this took no notice of my question as to why I had only received a rejection notice for two, instead of for four, I wrote again, reiterating this, and saying that I could not send again for pictures, and must look to them to return the missing two, and at their own expense, as the error was entirely on their side.

Unfortunately, before this reached the Hon. Secretary, he had, on his own initiative, had the pictures sent to me, and on which my housekeeper had to pay 2*s*. I have written twice for this 2*s*. to be refunded, or have a justification of its charge. The reply I get from Mr. Maskell is the one I now quote:—

"*October* 10.

"SIR,—In reply to your letter of October 1, demanding the return of expenses paid by your housekeeper on two pictures by Mr. Day, of Boston, I have to inform you that I see no reason for complying with a demand of the kind. "Yours truly,

"ALFRED MARSELL, *Hon. Secretary.*"

I don't think I have ever received a letter that has so "riled" me. Its absurd attitude of superiority, the non-necessity of any condescending to reasons or argument implied in it, indicate a lack of the first principles of courtesy that should govern every action or letter of an official (be he a paid or a honorary servant), that is at least surprising when coming from Picadilly. I replied to this, but got no response whatever.

I therefore publicly ask the Salon to say by what by-law or condition of entry their Hon. Secretary justifies the non-sending of a rejection notice, the return of the pictures, and the charge made for them? Is an exhibitor who receives a rejection notice for two pictures, out of six sent in, to suppose that there will be others at a later date which he must pay a fee for the return of? I could easily have had all my rejected pictures on the proper date, when I sent for them, in strict accordance with the entry form. The Salon will not miss any work I may withhold from it in future years—there are plenty of good workers to fill its walls—but I certainly shall not again risk being subjected to the extremely discourteous treatment they have seen fit to mete out to one who has been invited to show from the very first.—I am, yours, &c., FREDERICK H. EVANS.

19, *Buckingham-street, Adelphi, W.C., October* 20, 1896.

To the EDITORS.

GENTLEMEN,—Mr. Charles Moss, in his defence of the management of the Salon, goes rather beyond what the circumstances of the case justify. Mr. J. C. Oliver's original letter was a protest against the unfairness of the Salon Committee, in sending invitations to contribute so worded that the only inference that intending exhibitors could draw would be that all work of sufficient merit would be accepted, instead of openly and fairly specifying that they only want a few to fill up the space that the members of the "Linked Ring" and their friends have not already appropriated. The invitation is similarly worded to that sent out by the secretaries of most photographic societies, with the additional intimation that the work sent in is to be submitted to a selecting committee. Merit alone does not secure admission to this Exhibition, and that the absence of merit does not of necessity involve rejection a glance at the walls each year will show. The catalogue gives the information that this year's Exhibition contains 339 frames. Of these, 189 are contributed by 43 members of the "Ring;" 48 by 24 foreign exhibitors, who are non-members; and only 98 by 61 British workers, non-members, or an average of roughly 1½ each. (There is one exhibitor who contributes four frames, whose residence is not given.) Mr. A. Horsley Hinton, a member of the Salon Committee, stated in the *Amateur Photographer* that about 1100 pictures were sent in, which involves about 750 rejections. Now, very few of these rejections were the members' own work, and it is quite safe to assert that *nearly* 700 *of non-members' contributions were rejected against* 100 *accepted.* Is it reasonable or fair to ask photographers, who are fully as enthusiastic in the development of pictorial photography as the members of the "Ring," to send in their best work when it has so little chance of acceptance? In the ordinary sense of the term the Salon is not an open exhibition. No one would object to this if the members would only admit the fact, instead of sending out invitations broadcast and contending that a certain standard of merit will secure admission irrespective of who the sender may be, as in other exhibitions.

Why is it that Mr. Charles Moss, like many members of the "Linked Ring," cannot write a word about the Salon without adding sneering remarks about the Royal Society and its Exhibition? "A New Link" is following the example of his older brethren in this respect, and he has already expressed his adherence to the only one article of faith in which there appears to be unity of opinion among the Links, that is, that the "Ring" is the only exponent of pictorial photography, and the only Exhibition where artistic photographs are to be seen is at the Dudley Gallery. Would "A New Link" also kindly explain how the members of the "Ring" are to perform the impossible feat of looking *down* on to the Royal Photographic Society?

Being an ardent "Royalist," I cordially endorse "Royalist's" letter in your last issue, but I have been somewhat puzzled to reconcile with "Cosmos'" consistent and well-merited criticisms of the attitude taken by prominent members of the Ring, the fact that while in your paper you devote two long articles to the Salon Exhibition, one is considered sufficient for the Royal. Whatever may be the relative merits of the two exhibitions, the latter is certainly far more representative, and of more interest to British photographers.—I am, yours, &c.,

Hastings House, Norfolk-street, London, W.C., HENRY W. BENNETT.
November 3, 1896.

To the EDITORS.

GENTLEMEN,—I notice a letter in your current issue, signed "A New Link." It purports, I suppose, to be written by a member of the Linked Ring, and that is the impression your readers would gather from it. Without further evidence, may I ask the latter to discredit its genuineness? You, Sir, may easily have been misled, for no list of members of this private Society has ever been published. The Society is an absolutely private one, and if a member of it had a grievance, he would, at least first of all, as a gentleman, bring it before his colleagues. He certainly would not write to the public press in terms which might easily be misunderstood, and lack the courage to sign his own name.

With the late forged letter, purporting to be from Sir William Harcourt, still in our recollection, some reference to the one in your columns becomes a necessity, otherwise I should not have taken the trouble to notice it.

Your other correspondent, "M. L. R.," is, of course, entitled to express his views; but, not having the *entrée*, as one may say, behind our scenes, his opinions can only be taken for what they may be worth.—I am, yours, &c., ALFRED MASKELL.

63, *St. James's-street, S.W., November* 3, 1896.

RE UNFAIR COMPETITION.

To the EDITORS.

GENTLEMEN,—From the letter published in your issue of October 30, in which the writer calls attention to a halfpenny morning paper's scheme of supplying the public with life-size enlargements (24×19) at 6*s*. 6*d*. each, it seems that not only photographers, but newspaper proprietors, have a hard struggle for an existence. This scheme has very naturally excited a great deal of unfavourable comment among the profession, and is acting, and will act for some considerable time, as a powerful detriment to the business of London photographers, and, of course, greatly help to lower the photographic profession.

I am amazed to see the proprietors of these two papers (for the same offer is held out to the readers of a halfpenny evening paper, issued from the same office) resorting to such illegitimate means to increase their revenue. Not satisfied with supplying 2000 readers of these two journals, the editor has increased, "at the very earnest request of our readers," the offer to 10,000; taking the two papers together, brings the total to 20,000. Should they secure this number of orders, the money taken would amount to between 6000*l*. or 7000*l*.—a nice little sum to take out of the professionals' pockets at this time of the year, when it is a well-known fact that, with the present rates, they do scarcely earn as much as expenses amount to. These six-and-sixpenny "beautiful three-quarter, life-size, crayon and indian ink portraits," cannot last, for to-day photography is judged by a double-edged standard, in which the finest requirements of science and art are blended; a standard that lacks even standing-room, for hit-or-miss class of work, rushed through by the hundred, can have no comparison with work turned out by first-class firms. Last week the editor of the papers in question tells us he has had "hundreds upon hundreds of orders." Can it be wondered at, considering the ample means of extensively advertising these "things of beauty, joy for ever?" No doubt, in time the editors' rooms of these papers will have all the charms of a bazaar.—I am, yours, &c.,

October 31, 1896. A PHOTOGRAPHER'S DAUGHTER.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street. Covent Garden, London.*

RECEIVED.—W. J. BARKER; F. E. G.; A. RIVOT & Co.; K. BELL; PRINCESS PEACE; F. CLARK. In our next.

LENSES.—BOSANQUET. Yes to both questions.

C. A. COLYER.—You had better call upon us some morning between ten and one, and we will advise you.

APPARATUS.—H. A. LOCKINGTON. It is against our rules to recommend particular makes of apparatus, but we are always glad to be of assistance on specific points.

EXHIBITING OTHERS' WORK.—BOURNE writes as follows: "Would you kindly tell me if it is legitimate to send an enlargement in competition at an Exhibition, finished and worked up by a well-known firm who work for the trade, enlarged, of course, from a negative taken by my operator at my studio?"—Certainly not, if you exhibit it as having been done by yourself.

LANTERN LIGHT.—T. WALTON says: "I was recommended to dissolve some albo-carbon in the oil I use in my lantern, as it was said to improve the light. I did so, but then the lamp smoked to a degree, and stank the house out. Should that be the result?"—It is quite what we should expect, unless the lamp had a strong draught, so that there was a sufficient current of air to consume the extra carbon added to the oil.

METHYLATED SPIRIT.—S. B. R. says: "I have some methylated spirit that I have had by me some years—before the new Act came into force—and, although kept in glass bottles, it has become quite a straw colour. Is it any good now?"—We have several samples ourselves that have gone the same—it usually does so when kept a long time—but we have found no difference in its working, or, at least, in any work we have employed it for.

BAS-RELIEF PHOTOGRAPHS.—J. RAMSDEN says: "Should esteem it a favour if you can tell me how to produce photographic bas-reliefs mentioned in your JOURNAL; also if you will give me address of Mr. Taber, or of any one who produces these."—In reply: See this JOURNAL of August 7, where the method is fully described. Mr. Taber is, we believe, in this country, and a letter addressed to him, care of the Camera Club, Charing Cross-road, will, no doubt, find him.

STAINED PRINT.—A. COLLIER asks: "Am I right in supposing the marks on the enclosed photograph to be caused by using the blotting-paper in blotting off until it becomes saturated with hypo? Your opinion will greatly oblige."—We cannot say positively that the stains in question are so caused. But using paper for blotting off when it is already saturated with the fixing salt is sure to lead to troubles of different kinds. There is little doubt that the stain may be caused in that way.

ASPECT FOR STUDIO.—ROGO writes: "Could you kindly say if a southern or eastern aspect would do for a studio if ground or patent rolled glass was used in glazing? Of course, eastern would, I expect, be better than southern, but would the latter do at all?"—Excellent work can be done in a studio with a southern aspect, but it requires some skill to do it, more than in working one with an eastern light. In the latter the sun has only to be contended with in the early part of the day; but with the southern aspect the sun has to be dealt with for the major part of the working hours.

IVORY MINIATURE.—MINIATURE writes: "Can you tell me whether the ivory for miniature painting should be prepared in any way, also is any medium, other than a little gum water, advisable, and where is the best place to procure the ivory? If not trespassing too much, is there a book upon miniature painting?"—No special medium is necessary. It is usual to rub the ivory over with a little very fine cuttle-fish powder before commencing the work. The ivory is supplied by all the artist's colourmen. We are not sure that any work is published on painting on ivory, we think not. Apply to Rowney & Co., Oxford-street. They may have a work that may deal with the subject.

KEEPING SULPHOCYANIDE.—PRINTER asks: "Could you inform me whether one pound of sulphocyanide of ammonia, diluted as soon as purchased in a comparatively small quantity of water, say, from two to four pints, will keep for a very considerable time, and whether distilled water would be essential? I get one pound at a time, given me to use by my employer, and I weigh it out at present one drachm at a time; but I fear after a time it becomes wet, and in consequence is not correctly weighed."—It is much better to make a stock solution of the salt than to weigh out the crystals in small quantities at a time. Unless the consumption is rapid, we should say, Dissolve half a pound, and then seal up the bottle containing the rest. It keeps well for weeks in solution, but the crystals rapidly absorb moisture when exposed to the air. Ordinary water may be used if distilled is not at hand.

BREAKING SURFACE OF GLASS.—A. C. WRIGHT says: "Will you oblige by informing me what is the name of the gelatine or other substance which is used abroad to so pull away the surface of glass in drying as to cause the peculiar cracked-all-over look one sees in glass ornaments of the kind? I remember an allusion by the late Editor in THE BRITISH JOURNAL OF PHOTOGRAPHY some few years ago to this substance, and if you can just state the name of the glue or gelatine, and where procurable, in a word or two, I shall be infinitely obliged."—If ground glass, such as is used for the collotype process, be coated with gelatine, and then be dried, and the drying be carried on in a tolerably high temperature, its contraction will tear away the surface of the glass. It is to the record of this fact that our correspondent probably alludes. Any strong gelatine will do that.

PRINTING, &C.—CYMRO. Will you please help me in the following questions:—1. If I fix a print (P. O. P.) in the hypo, is it as permanent as one toned and fixed? I like the tone when only fixed. 2. Where is the fault? I developed a plate, and while printing, after drying the print, I find that as to the collar and the neck there is no distinction between them? 3. Do you think there would be a vacancy for one going out to Africa in the photographic trade? I have been advised to go out for the benefit of my health. If you know of any firm that want a man, please mention in this week's paper. 4. While toning P.O.P. I find that the edges of the print tone quicker than the middle portion, and the result is that the edges of the print tone darker than the middle.—1. Doubtful. 2. Evidently the negative is faulty. 3. We know of no one requiring assistance at present. 4. Keep the prints in constant motion while toning, as also when washing prior to toning.

SPOTTY PRINTS.—A. E. G. says: "I should feel obliged by any information as to the source of spots on prints. I have been much troubled by it of late. Sometimes it is much worse than others. If I remember rightly, about two years ago you answered a correspondent about the same, which I think you said was caused by particles of iron dust. Do you think, where the spots appear at the back only, they would have any influence in fading the front of print? My batch of prints last week was much freer from spots than on any former occasion. I had each print toned face downwards, with the result mentioned above. Do you think this the cause of improvement? How do you think they can be prevented?"—In this case it is pretty clear that the spots are due to particles of foreign matter coming in contact with the prints at same stage or other. Whether they are iron or anything else we cannot say. Their avoidance is easy with additional care. It is possible that the spots at the back may eventually show in the front.

LANTERN MATTERS.—MAGIC LANTERN says: "I should feel obliged if you would give me your advice on the following questions: I have one of ——'s enlarging apparatus, one something like the one in their advertisement in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1896. 1. Is it suitable for giving magic-lantern entertainments? it has a three-wick lamp, burners one and a half inches wide, and a four-inch condenser. The lens is the same as supplied with the apparatus. 2. What size picture should it give on the sheet? The last time I tried it, I think it must have been too big, viz., twelve feet, the slides looked awful yellow, and the light was bad indeed. 3. Could I have incandescent gas burners? would that be quite so hot? I find the outside woodwork is cracking with the heat from the lamp. 4. My next trouble is in colouring lantern slides. In the first place I can paint in oils, being a portrait painter, but I find when I have done a slide, and it is in the lantern, it looks ropy, and some of the colour does not show at all, although when out it looks fine and clear. Please tell me where I go wrong. Water colours I can't manage on the slides any way. With the Diamond dyes I get on fairly well, but do not like them, for, should you make a blunder, you cannot alter it. Do slide painters use any special medium? if so, can you please tell me the name?"—In reply: 1. Yes, on a small scale. 2. The screen was too large for the light. 3. The incandescent burners would not radiate so much heat as the oil lamp. 4. This is simply due to the work not being fine enough, the brush marks showing too strongly when magnified. We do not think that any special medium is employed.

SILVER PRINTING *versus* PHOTO-MECHANICAL PRINTING.—FUTURE says: "The following questions are troubling my brain very much, will you kindly answer them? (The questions are not meant for any particular country, competition being as great here as anywhere else.) 1. As the average conjunctures now are for the landscape firms working on a large scale in silver prints, can such a business, in expert hands, and now started, be made to prosper in the end, while patiently gathering the most valuable negatives summer after summer, and having capital enough to lay out for a reasonable number of under-balancing years? 2. Will it be only a question of time when photo-mechanical processes will kill the silver printing for such purpose as above, or spoil its business by cutting prices still more? if so, within how near a future will such be the case, and which photo-mechanical process will be the main competing one against the silver printing? 3. Will it mostly be the new silver printing landscape firms that will take up the photo-mechanical processes in question 2 for landscapes, or will it mostly be other firms that will go in for it? 4. Which precautions should already be taken by the now silver printing landscape firms with a view to the future when photographing their landscapes?"—In reply: 1. It is very doubtful; we ourselves should not care to run the risk of starting such a business in the hope of its paying. 2. Generally speaking, yes. We cannot fix a date, but probably collotype is the most formidable competitor silver printing has. 3. The chances in each case are about evenly balanced, we should say. 4. If we understand the question aright, it is, Is it worth while landscape firms adopting photo-mechanical printing methods? We should say yes in such cases as that supposed by our correspondent.

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EX CATHEDRÂ.

It will be observed, from a brief report that we give in another part of the Journal, that the General Committee having charge of the Traill Taylor Memorial Scheme has, at length, on the recommendation of the Executive Committee, come to a decision with regard to the best form which the memorial should assume. The annual income of the invested funds is to be applied to the holding of a lecture, preferably embodying the results of original research, and a commemorative medal will be bestowed upon the lecturer. A permanent committee, consisting of town and country members, has been appointed. For other details of the scheme we refer our readers to the report. In all probability the very best manner of perpetuating Mr. Taylor's memory has been chosen, and it possesses the added advantage of stimulating, to some extent, photographic progress.

* * *

The Executive Committee has met several times during the year, and their recommendations were the result of much anxious deliberation and discussion. To Mr. Alexander Mackie, who has acted as Secretary and Treasurer of the Fund, and who, in all probability, will continue to serve in the former capacity, every credit is due for the time and trouble he has devoted to the Fund. Our own thanks are, in a special manner, also tendered to him for having adopted the suggestion made to him nearly a year ago to interest himself in the matter.

* * *

The lecture recently given at the Camera Club by Mr. Arthur M. Brice, on the Jackson-Harmsworth Polar Expedition was noteworthy from a photographic point of view, as it elicited from Mr. Child, the photographer to the expedition, some details as to camera work in Arctic regions. He said the chief photographic difficulty arose from the condensation of moisture from the hands on the plates. The exposure required was very short owing to the strong light and clear atmosphere, and to the fact that the subjects photographed reflected a considerable amount of light; with a slow landscape plate, one second was sufficient with *f*-64. Development was easy, as the temperature in the house was never below 40° F., but there was some difficulty in obtaining enough water for washing the negatives. Rolled films were very useful, as they required less handling, and, if they got immersed in water, only the outside was damaged. Interesting, however, as these details are, it is highly probable that they could advantageously be amplified. Will not some enterprising secretary of a photographic society persuade Mr. Child to "fill an evening" with the subject of photography in the Polar Regions?

* * *

A lady writes us as follows, with reference to the formation of a Society for lady professionals. So far as we know, no such Society has ever been mooted, but we entirely agree that there is plenty of scope for the carrying out of our correspondent's suggestions: "Might I ask you whether any one has ever started, or thought of starting, a society for lady photographers—I mean professionals, *not amateurs*, of the same description as the Society of Musicians? It seems to me that a helping hand could be held out often to members of such a society when in sickness or out of a situation. It could be supported by a subscription from each member, and also by voluntary contributions. I myself am an orphan, and, though I have relatives to whom I can go, I feel too independent to care to be a drag on them. I may also remark that, as in all trades, photographers seem to think, as long as their employees eat and drink and look respectable, that is all

that is needed. They do not consider that clothes cost money and one does not grow younger. It also seems to me that employers in need of assistants could always apply to a society of this kind, thus facilitating matters on both sides. I am afraid I have expressed myself rather incoherently, but so many women earn a living at this kind of work as operators, mounters, spotters, and in various capacities, there seems a need of some kind of help for them, especially as they are none of them *over*-paid."

* * *

The Multum in Parvo is the title given to negatives which Mr. Singer, photographer of Chippenham, is supplying for Christmas and New-year's card purposes. The design consists of an ornamental border with a seasonable greeting, and spaces are left for printing in a view of one's house or a portrait of oneself. The idea is a good one, and may be appreciated by many at this time of the year, when novelties, however small, are welcomed.

* * *

The Actien-Gesellschaft für Anilin-Fabrikation, of Berlin, inform us that at the Berlin Industrial Exhibition, 1896, they have received the highest award, the Gold State Medal; and that their exhibits at the International Exhibition for Amateur Photography, Berlin, 1896, likewise received the highest distinction, the Gold Medal.

COLLODION SCREENS FOR ORTHOCHROMATIC PURPOSES.

Now that colour screens have come to form so important an addition to the numerous paraphernalia of the photographic *atelier*, the easiest means by which they can be improvised is a matter that must exercise many minds. Optically worked sheets or discs of suitably coloured glass are necessarily expensive luxuries, besides being liable to physical defects from which ordinary plate glass is in a great measure free; consequently, coloured films, spread upon properly polished plate glass, are more generally employed, and, if less permanent, are at least more easily renewed should any accident happen.

Of the various media employed in the formation of the coloured coating, spirit varnish, gelatine and collodion are those most generally in use; and, though the last-named has been condemned by many experimenters as useless, on account of the "structure" it shows, it will be our endeavour to show that injustice has been done to collodion, and that, in fact, if properly prepared, it is far the best of the three. With spirit varnishes we have had practically no experience, the few attempts we have made with such preparations having been so manifestly inferior to either collodion or gelatine that we have never thought it worth while to persevere. With gelatine, undoubtedly, very fine films may be obtained, so far as freedom from structure is concerned; but there is always more or less tendency to mechanical defects and a want of absolute transparency, such as can be obtained with collodion, besides which the extreme care necessary, in the preparation both of the solution and the screen, renders the manufacture one of the greatest delicacy. With collodion, however, when the proper sort is obtained, the removal of an injured screen is a matter of only a few minutes and very little care.

The first step in the preparation of the collodion is to obtain a suitable sample of pyroxyline, and this is the point on which all those who run down collodion screens have come to grief. If collodion for the wet or dry processes depends for its quality upon certain properties of the pyroxyline from which it is made, the same is equally true when it is to be used for screen work, and it may be remarked that the very qualities that go to render a sample of cotton especially fit for photographic purposes may be just those that have a reverse tendency when clearness and freedom from structure are concerned.

In examining a number of samples of pyroxyline, they will be found to vary very materially in the character of the film they give, when dissolved and spread upon glass. Some—and these are the ones that are frequently best adapted to negative purposes, especially dry plates—are at once placed out of court owing to their setting and drying with a certain amount of opalescence. These may be at once rejected. Of those that appear to be perfectly clear, some will present, when set, a fairly, if not perfectly, even surface, while others will set in lines or ridges running in the direction of the "pour off." Although the latter may dry apparently as even as the others, they also should be rejected, as, when colouring matter is added, the ridges will show more or less after drying, owing to the greater thickness of colouring they contain.

But the solvents employed in making the collodion exercise an equally important influence on the character of the film, as all old collodion workers are well aware, not only so far as their quality is concerned, but equally as much in the proportion to which they are used. Thus, the addition of water to collodion, or, what is tantamount to the same thing, the use of weak solvents, *i.e.*, those of high specific gravity, is known to render the film open and porous, but, at the same time, to make it flow unevenly, and dry with more or less structure. Then, again, a preponderance of alcohol in the mixture is found to give a film which dries slowly and without structure, though the collodion may flow rather unevenly, while an excess of ether causes the film to set quickly and evenly, but with a fine "ribbed" or "twill" surface, while moist and thin lined surfaces will, as already stated, show in the coloured screen.

Almost every sample of pyroxyline exhibits some difference in behaviour under similar conditions of treatment, some requiring an excess of alcohol over ether, and others the reverse. Some, again, absolutely require the very strongest solvents, while others will admit of the presence of a considerable proportion of water without exhibiting any marked "structure." Hence it is only by carefully selecting the pyroxyline and afterwards as carefully studying the proportions of the solvents with which it works best, that perfect success can be realised. But, as a small stock of such collodion will last a long time, the trouble will not be wasted.

The best way, however, to arrive at a structureless film with as little trouble as possible, failing a really good sample of cotton, is to operate on such as may be obtainable in such a way as to render them suitable. It is well known that by the action of water upon pyroxyline in the state of solution, that is, in the form of collodion, its character and properties are very materially altered, and in this direction lies the power of rendering almost any sample of cotton—except such as are naturally opalescent—suitable for our present object. In other words, by precipitating the gun-cotton from collodion already made, drying and redissolving it, its characteristics are so materially altered that it almost invariably gives a limpid, easily flowing, and structureless film. Added to this, it may be said that its solubility is so greatly increased, that very much.

thicker films may be used without incurring the danger of unevenness, and, by the removal of any remaining traces of acid and the greater purity of the resulting collodion, there is less danger of the colouring matters subsequently added being damaged or altered.

To prepare the precipitated cotton, take any ordinarily good sample that sets and dries quite transparent, and dissolve it to form as thick a collodion as may be convenient in view of subsequent filtration or clearing. It will not do to make it so thick that insoluble particles will not subside, but just thick enough to economise solvents. Let it clear by subsidence or clear it by filtration, and then add to it, a little at a time, sufficient water to make it begin to look thick. Then pour it in a thin stream into a large volume of clean water either cold or very slightly warm, and stir it vigorously all the time. The result will be a bulky, white, flocculent mass, which, after changing the water once or twice, may be squeezed out and dried in the sun or in a gentle oven.

Pyroxyline so precipitated will be found very soluble, to the extent sometimes of thirty or forty grains to the ounce of solvents; to give a perfectly clear collodion, to flow evenly unless too thick, and to dry without structure; to be, in fact, the very perfection of pyroxyline for making screen collodion. If this be dissolved in absolute alcohol and ether, if not higher specific gravity than ·720, it will give a clear hard film that is scarcely scratched with the finger nail, and that will bear a considerable degree of magnification without showing any grain or structure.

Celloidine forms a very good basis to work upon, being pure and limpid and comparatively free from structure, but it must be remembered that it is not a precipitated preparation, and has therefore not undergone the chemical change that gives the latter its peculiar properties.

A stock of prepared collodion on the principles stated above can be kept on hand and coloured with any suitable dye as required, the process of applying it to a piece of optically worked glass, and the subsequent drying scarcely occupying the time required to pen this paragraph, while the result for working purposes will prove at least equal to the best and most expensive screens obtainable.

The New President of the Royal Academy.—Contrary to the expectations of some who were supposed to be able to form an opinion, Mr. E. J. Poynter, the Director of the National Gallery, was, at the meeting last week, elected President of the Royal Academy, as successor to the late Sir John Millais. A fortnight ago it was thought in some quarters that the honour would fall to Mr. Val Prinsep, but in the first vote at the election that gentleman received but little support, the greatest number of votes falling to Mr. Briton Rivière, Mr. Poynter, and Mr. Dicksee. In the final vote, Mr. Poynter secured 19 votes, and Mr. Rivière 16. The former artist was therefore declared duly elected to the highest honour that artists aspire to. It is to be hoped that the President will live to enjoy the distinction much longer than did his predecessors.

The Illustrations in the Royal Photographic Society's Catalogue.—A correspondent writes asking if the illustrations in the Pall Mall Exhibition catalogue were done from the identical prints there shown or from others supplied for the purpose. He says he asks the question because several of the pictures in the book show more detail, and have greater vigour, than is seen in those on the walls. As we have heard several comments to the same effect, we give prominence to the query here instead of in the usual Correspondence column. It would be interesting to a good many to know, authoritatively, if the negatives from which the blocks were produced were taken from the actual prints shown or whether they were taken from others; and, if the former, whether the greater detail and vigour seen in some of the reproductions are due to hand work on the negatives or the blocks.

Something New (?)—One of the evening papers that often "enlightens" its readers on scientific matters, one day last week said:—

"An enterprising photographer has succeeded in photographing a bullet in its flight. He has also succeeded in photographing those waves of air which are produced by the tremendous onrush of the bullet through the elastic medium of the atmosphere, and which are expressed not to our eyes but to our ears by the 'sing' or hum of the fatal missive. In front of the ball is a dark line of compressed air and behind it the hole cut in the air may be seen closing up."

After this, possibly, in the near future, our contemporary will chronicle the demise of Queen Anne. Professor Boys must feel highly flattered at being designated "an enterprising photographer," we should imagine.

Röntgen Rays at the Hospitals.—Mr. Luxmore Drew held an inquest at Hammersmith, one day last week, on the body of a child who died from ulceration of the stomach and hemorrhage, through having swallowed a halfpenny. In the evidence one of the witnesses is reported to have said that she had taken the child to the hospital, and they had offered to photograph the boy, to find where the coin was, but she could not afford the five shillings fee. If this statement be true, it would seem that, although the hospitals are taking advantage of the X rays, it is only where the patient is able to find the fee for the photographing. Five shillings is little enough for taking a photograph of a child's body, but it is a sum that many patients who are compelled to avail themselves of hospital treatment cannot afford. If they cannot, and the above statement be correct, then Röntgen's valuable discovery is as nought to them.

A New Art Reproduction.—It is stated, in a daily contemporary, that the Committee of the Burlington Fine Arts Club has obtained permission from the President and Council of the Royal Academy to reproduce by photography, and by the carbon process, the famous cartoon, by Leonardo da Vinci, in the Diploma Gallery, Burlington House. It is added that, as it is felt that many lovers of art, throughout Europe, desire to obtain copies of such a unique and extraordinary work, exceptional arrangements have been made by which students and connoisseurs may obtain copies; but these copies are only to be had through members of the Club. It will be interesting to see if the reproduction will be executed by an English or by a foreign house. We have heard that this famous work was photographed some little time back by a foreign firm, but whether for a restricted publication or not we cannot say. If this work is of such great interest, and it certainly is, to art students, it is a little surprising that the Royal Academy does not permit the work to be reproduced for unrestricted publication.

Another Judge on the Pharmaceutical Society's Prosecutions.—County Court judges are continually expressing their opinions on the vexatious actions of the Pharmaceutical Society. As was seen by our last issue, that astute Judge of the Bow County Court, Judge French, made some very strong comments on the subject in the case where a poor man had innocently procured some rat poison, to oblige a neighbour, as he thought. The Judge asked the Society's representative if he pressed for the full penalty of £5 against this poor man, whose wages were 30*s.* a week, on which a wife and four children had to be kept. He did, and the Judge had no option in the matter but to order the payment of the 5*l.* with costs. The Society will get their "pound of flesh," but they will have to wait for it; for Judge French marked his idea of the prosecution by ordering the payment by instalments of one shilling

a month. This will take over eight years to complete it. The Pharmaceutical Society will not profit much over this transaction, we opine.

Photographing in the Parks.—The Royal park-keepers are evidently fully alive as to the appearance of hand cameras, unless they are less conspicuous than was that of a writer to the *Standard* one day last week. He says that he was informed by two park-keepers that he could only photograph in Hyde Park with a special permit, one of the officials remarking, "You see, sir, yours is the instantaneous process." The writer adds that he has since obtained one of those precious documents, and finds that it is not available on Sundays. But what strikes him as more extraordinary is that "the photographing of persons or groups is not permitted," and asks, if armed with "the magic permit," whether a photographer is deterred from taking snap-shots at the cyclists and equestrians in the Row? We imagine that there is no impediment to taking such pictures as those alluded to. The regulations as to "persons and groups" are intended to prevent itinerant photographers of the ferrotype order from taking up their stands in the parks. It would never do to allow the parks to be studded with the itinerants' paraphernalia, such as are to be met with on Kew Green, for example, on Bank Holidays. If we remember rightly, many years ago a professional photographer was allowed a stand near the Row, where he took equestrians' portraits, but the photographs were of a much better order than those of the present itinerant class.

PHOTOGRAPHS AND CHARACTER READING.

The large extent to which some of the weekly journals devote their attention to giving written statements of the character and disposition of their readers on their sending a photographic portrait caused me to make reference to a well-known phrenologist, in whom I had confidence, to ask him certain questions with a view of satisfying myself of the value of such reports or opinions.

The first question I asked Professor W. Cross in his consulting room at Victoria-street was this: "Can a person's character be read or told from a photographic portrait?" and his answer was: "Yes, decidedly yes, and if you will read my opinions on the photographs of the well-known men and women I have placed in the window, you will be able to judge how far I am able to read characters from the phrenological aspect of the head." After making a few notes for him to consider in my absence, I went outside and looked at the photographs he had displayed for the public to see, with the character and disposition report attached thereto. I was simply astonished at the outspoken nature of these reports, and in the case of a Royal couple recently married, if each knew of the peculiarities of the other, and they were free agents in the matter, it would be quite a wonder if they ever had married.

No doubt there is a good deal to be said in favour of the White Cross League, and the elimination of hereditary taint, and, if young folks are to know if their lovers are likely to make suitable partners for life, they cannot do better than get a phrenological report. I imagine, however, that, in both sexes, there would be a strong objection to submitting to examination for the information of the other, but no objection probably to submitting a photograph for report.

As an extra means of bringing business to photographers, it may be worth while for professional men to know what is required by the phrenologist to aid him in his report. The best of all positions is profile, for then he can see the ears, the back of the head, the crown, and the brow. In the case of ladies, the hair must be dressed so as to show these portions of the head.

With a view of testing the accuracy of this system of examination, I submitted photographs of three persons well known to myself, and three well known to the Editor of this Journal, but neither of the six had ever been seen by Professor Cross, or were known to him by reputation or as public characters.

Having so far become interested in this matter, I said to myself, Would it be any advantage to a professional or business man if he had a certain amount of phrenological and physiognomical knowledge? and, propounding the question to the Professor, he said that to "take stock" of one's patrons or clients was always an advantage from a commercial point of view. He thereupon gave the following examples:—

The Vain Man or Woman would be known by the lips being of a cupid's bow shape, and they would be somewhat affected in manner generally. They would like compliments paid them, and even be pleased with flattery in some cases.

The Proud Man would be noticeable by large development in centre of the head (the crown), and he would have to be treated with respect, and not in any way flattered. He would be bigoted in his views, and must be humoured and nothing forced upon him. If anything was in question it should rather be put, "Not wishing to go against your judgment, but I suggest," &c.

The Avaricious Man will be found to be broad at the back of the temples, and head flat above, showing lack of moral and refining qualities. He is not likely to be a patron to any large extent; in fact, often these gentlemen only have their portraits taken at their country's expense (in Her Majesty's prisons).

The Nervous Man will be broad at the head in the region of the parietal bone, and often very shallow round the ears. He must be put at his ease at once by having his attention drawn to something attractive in the studio, and the actual business of portrait-taking deferred a little until his confidence is secured. Other causes of nervousness are indigestion and ill health, shown by hollows at the side of the skull in front of the ears, but on the brow level.

The Open-handed Man will be known by being flat or hollow at back of temple, but care must be taken to study the back of the brain to see if the skull is well arched (in Saxon form); if not well arched, he might, and probably would, forget to pay for his photographs, &c., if trusted at all.

Tact is shown by a well-rounded head just above the forehead. This is one of the most useful developments a commercial or professional person can have, and, if one thinks of the successful men in the medical, legal, military, and other professions, or the trading world, those who have achieved fame in nearly all cases are such as have had the common sense to secure and keep friends or retain the services of those who could render them most assistance, their own personal abilities or genius being in many cases not transcendent.

Lovers.—If a man or woman wishes to know the disposition and character of his or her lovers, it is necessary to have a profile photograph of the head, because the development of the skull at the back, or lack of it, will show whether the love would be lasting or fleeting.

Practical advantage to parents in the phrenological examination of children will accrue by their being told their capabilities, for it is no use to put a child to an engineering business if he has no mechanical tastes, or to painting and music if these developments are non-existent in his or her skull. In cases of choosing managers, secretaries, or assistants for positions of trust, a photographic examination reveals dispositions that are seldom wrong, and, in criminal cases, the character reading of submitted portraits has been wonderfully verified by acts and deeds

I append Professor Cross's reports on the photographs I submitted to him. Nos. 1, 2, 3, and 5 are those of persons known to me, and I can vouch for the accuracy of the delineations.

Nos. 1B and 2B refer to photographs handed me by the Editor.

"*No.* 1.—As far as can be seen of this child's head it is indicative of a high degree of literary ability. It is endowed with a great amount of the emotional temperament and granting vitality improves it will excel as a writer of fiction, but unfortunately the photo indicates a great lack of vitality. There is also much musical and artistic ability. Would be very kind and sympathetic in disposition and exceedingly sensitive to the world's opinion. Cautious and diplomatic, but unfortunately the head is too much covered to give a very accurate description.

"*No.* 2.—"The constitution is somewhat delicate. Very romantic temperament, ideality being so large that this lady will suffer too much from despondency, because the practical will not come up to her strong ideals of what they should be. She is quick in reading character, has a very emotional temperament, will be too fond of the mysterious, and must avoid all forms of mysticism; will be sympathetic, very lovable in disposition, and will not be truly happy unless she has a partner of the opposite sex in whom she can confide. She must never live in a malarial climate. If she had the fever, would have it very badly.

"*Nos.* 3 *and* 5 appear to be the same; but, taking No. 5 to describe, he possesses a high degree of the mental temperament. The brain is far too active for the physical conditions, and he will have to be most careful of diet, and must be most careful not to overtax the brain in any way whatever. His head is indicative of a high degree of firmness and stability of character; he will be most persevering, and yet he will not undertake anything without well considering the end, as he possesses a large development of caution and causality. This combination confers upon him a sound judgment and much originality of mind. Will decidedly be a lover of order and discipline, and will be most methodical in everything that he takes in hand to do. Pretty accurate as an observer, imitative, and possesses much dramatic ability, and, had he been stronger, he would have made a good comedian. Upon matters of theology somewhat broad in his views. Although brim full of fun and wit, yet hope is moderately developed, and therefore occasionally will suffer from feelings of despondency and heaviness, and more especially as the liver is rather inactive.

[Note.—Nos. 3 and 5. These are brothers; hence, the similarity of features.—G. B.]

"*No.* 1B (*Lady*).—This lady possesses a very decided character in many ways. The faculty combativeness is well developed, and it confers upon her a high degree of nerve and courage. She will be decidedly progressive in her thoughts, and, doubtless, will often wish she had been a man. Intellectually, she is a most keen observer, most critical, and will detect mistakes in the reasonings of others with great rapidity. She has large benevolence, and this will make her a reformer, and she would take great delight in putting forth efforts to improve humanity. She

possesses a high degree of artistic and musical ability, and upon the stage would have manifested very great talent. Very great in her likes and dislikes, yet will manifest a great amount of tact when dealing with others. Amativeness is very large. She must have fallen in love very early in life, and even then had a very exalted opinion of what her lover should be. Although she possesses great practical talent, yet she will be deeply interested in the mysterious, and, if she had the time, would take delight in reading up occult sciences. The head being covered, the back of brain cannot be described, excepting amativeness already noted.

Constitution, very wiry. Great power of recuperation, and would surprise medical men how she would pull through an exhausting disease.

"*No.* 2B (*Gentleman*).—This gentleman possesses very marked abilities of a scientific nature, he will be most methodical in his manner of reasoning, punctual in all his appointments. Language, very small, not fluent as a public speaker, but would be brilliant as a writer. Very clear insight into character, and, in fact, would be very fond of the study of nature generally. Great firmness of character, and yet has been sympathetic in many cases to his own disadvantage, as caution is not large. Very courageous in the midst of danger. Social in disposition, yet never affected in any manner whatever. Most independent, and will decidedly rely on his own judgment. Would have been very successful as an historian, or in literary work. Constitution strong and vigorous; only difficulty would be that the nervous system may overtax the digestive organs, as this appears to be the weakest part of his frame. In music would be successful as an organist, and, as a teacher, would exercise very great power over young men. Possesses a great amount of true love and affection, but the intellect would decidedly predominate over the amative propensities."

G. R. Baker.

[We handed Mr Baker three photographs to be submitted to Mr. Cross, who, in his reports (Nos. 1 B and 2 B) describes the characters of the originals—one of whom is now dead and the other not resident in England—with remarkable correctness. The third photograph was that of ourselves, and those who are qualified to judge declare the Professor to have given a very exact reading.—Ed.]

THE LATENT IMAGE AND THE THEORY OF DEVELOPMENT.

It may not be uninteresting at the present time to give a summary of some of the older hypotheses which have been advanced to account for the formation of the latent image and the development process.

In 1853, Schnauss published a treatise in the *Archiv der Pharmacie*, vol. cxxiv. pp. 6, 7, "On the chemical processes in the production of photographs," and stated that he considered the development of the latent image as a special kind of electrical attraction, in opposition to the generally accepted theory of the chemical decomposition of the silver iodide. He considered that it remained unchanged, and merely became endowed with electrical power to attract the silver particles in *statu nascendi*.

Notwithstanding the many experiments and papers published during the next few years, most of them dealt indirectly with the subject, by drawing comparisons between the formation of the image in printing-out processes and the invisible image; but, in 1857 (*Bulletin de la Soc. Française*), Davanne published an important paper, in which he points out that light could produce chemical decomposition, chemical combination, and molecular attraction; as a proof of the latter, he draws attention to the well-known fact that a glass or silver plate when touched with a hard substance would at that place condense the breath, and he argues that the appearance of the photographic image, whether on glass, metal, or paper, should be ascribed to molecular attraction.

He goes on to say that the question, "What is the action of light?" can only be answered by hypotheses, because no action is recognisable, either by the eye or by analysis; but the assumption that the light exercisee a reducing action is supported by the fact (1), that the silver salts are almost all reduced by light; (2), with many preparations the image when the plate is removed from the camera is visible, so that a reduction must have taken place, or, in other words, a subiodide or metallic silver has been formed which could be proved by analysis.

It might also be assumed that, instead of a separation of the elements having occurred, a release of the smallest particles had taken place, since by the more or less strong light action the molecules had been slightly removed from one another, and that development completed this separation and set free the silver molecule. In such a case, pyrogallic or gallic acid ought to be able to develop the image on a thoroughly washed silver iodide film, and this Davanne had been unable to do. He finally comes to the conclusion that the silver film is reduced invisibly by light, and the silver molecule set free by the developing agent was deposited on this, and as the deposit increases the image becomes visible and will develop with ever-increasing quickness. It therefore follows that all bodies which can reduce silver nitrate or metallic salts are suitable for development of the photographic image.

In *Horn's Photographic Journal*, vol. xvi. p. 2, appears an extract from Marie-Davy'e work, *Hauptinhalt der Untersuchungen über die Elektricität*, which is somewhat too lengthy to include, but which suggests the action of electricity.

Hardwich, in his *Manual of Photographic Chemistry*, 1863, p. 37, distinctly states that it is the hydrogen which reduces the silver haloid to the metallic state and not the developing agent.

Monckhoven contributes the next important paper, and he comes to the conclusion that silver iodide does not suffer chemical decomposition in light, and there is no reduction, assuming that it is not combined with any organic substance; and he says, (1) if light acts chemically on silver iodide and silver itself, or the suboxide be formed, diluted nitric acid must dissolve the silver or suboxide. A plate thus treated, and well washed to remove the nitric acid and flooded with pyro and silver nitrate, gives, however, an image which, although faint, is distinctly visible; (2) silver bromide darkens easily in light, nevertheless it is less sensitive than silver iodide if a developer is used; (3) if the action of light on silver iodide were chemical, it must be in proportion to its duration, that is to say, if one second produced a vigorous image, two or three seconds must produce an image twice or three times as intense. But this is not the case, light needs a certain time to produce a maximum; if this is overstepped, the action decreases and the image loses its intensity, which has been called solarisation.

He recalls some of Moser's experiments which have some bearing on the question; (A) if a sheet of glass be exposed to sunlight under a stencil, the breath will condense on the exposed part and make the light action visible; (B) a silver plate gives the same result, but, if, instead of breathing on it, one exposes it to the vapour of mercury, the image can be made visible after a much shorter exposure; (C) if a copper medal be gently warmed and laid on a polished silver plate, the breath or mercury vapour will condense and make the image visible even if the experiment be performed in the dark; (D) if the medal is left very long on the silver plate, the image produced by the breath or mercury is solarised and the reverse of (C) is obtained.

This is exactly analogous to the action of light on silver iodide. Monckhoven finally concludes by saying that the action of light on silver iodide is purely physical; and, if in certain processes an image is produced by chemical action, this must not be ascribed to silver iodide, but an organic silver compound.

In 1862, Poitevin published his work *Traité de l'Impression Photographique sans Sels d'Argent*, in which, in chap. x. p. 129, he says, "If light is to reduce a substance, another substance must be in contact, or mixed, with it, which substance must be capable of absorbing the element set free, and forming a more stable compound." This view was subsequently advanced by Vogel in 1865.

In the *Photographic News*, 1866, p. 380, Carey Lea advanced the theory that the latent image was merely of a physical nature, and that there was no chemical decomposition of the haloid, no iodine or bromine was set free, and finally, that, at least in the wet-collodion process, the image was formed at the cost of the developer. In order to support this theory, he made the following three tests:—

(1) If a reduction takes place during the formation of the latent image, that is to say, if iodine or bromine is set free, then the haloid must, to a certain extent, lose in volume. He developed an image in the ordinary way, and, instead of dissolving out the unaltered haloid by fixation, he allowed it to remain, and dissolved out the silver image; and, to effect this, he placed the plate in a weak solution of mercuric nitrate, in which, in three or four minutes, the image entirely appeared. The well-washed plate showed a perfectly flat surface, without the slightest trace of a positive image, and therefore, no iodine or bromine could have been used.

(2) The second experiment was still more convincing; the same developed plate which, as just described, was treated in the dark room with mercuric nitrate, and was then found to be an absolutely unchanged homogeneous film, gave after careful washing with ferrous sulphate, on treatment with silver nitrate, exactly the same negative, by which it would appear to be proved that the latent image had not been destroyed by the mercury, as, after removal of the silver precipitate, it could be again developed.

(3) In the third experiment Carey Lea used, instead of iron, the pyro developer, and obtained the same satisfactory results.

This extraordinary result that an image could be developed twice, or three or four times, and that each time the sensitive film can again be brought back to its original condition, shows also that the latent image is not altered by development, that is to say, remains

in the latent condition, from which Carey Lea concluded that it only underwent a physical change, and his theory was thus completely substantiated.

Another experiment of Carey Lea's is very striking, and was considered by him to still further substantiate his physical theory. A sheet of ground glass was coated with pure metallic silver, iodised, and carefully washed, and exposed for some hours to bright sunlight, and then for some time to diffused daylight. Finally, it was kept in a yellow covering in the dark for thirty-six hours, and, at the end of this time, was exposed under a negative for a few seconds. On development, it gave a sharp, clear image, without any trace of fog. There was obviously no organic matter present here; but, when a bromo-iodide collodion plate was treated in the same way, a much fainter and foggier image was obtained.

We now come to Nelson K. Cherrill's theory of the polarisation of the silver haloids, which was supported by a long paper from his pen in the *Photographic News*, 1866. In 1866 there appeared a paper in the *Photographische Correspondenz*, from the pen of Dr. Reissig, in which he details several experiments with silver iodide, prepared in various ways such as with excess of nilver nitrate, and also potassium iodide, and found that, although the iodide darkened, yet he could detect no sign of chemical change, and he concluded that the purest silver iodide, when exposed, underwent no chemical change, and yet was capable of attracting silver from the developer. He also states that a film of iodide of silver, exposed to light in the presence of silver nitrate, and treated with iodine prior to development, gives no image, proving conclusively that the iodide, under these conditions, is transformed into subiodide, which latter compound again reverts to its original condition by absorbing the iodine with which it is treated.

In the *Photographic News*, August, 1867, p. 406, appears the translation of a paper, by M. Sytenko, in which occur the following passages:

"The action of light upon pure iodide of silver sets up an electric current which tends to precipitate the molecules of metallic silver; but, the intensity of this electric current being much weaker than the chemical affinity possessed by iodine for silver, the tendency of the latter to become precipitated takes place only in the presence of a third body having no affinity for iodide of silver.

"If the light has been very intense, and, consequently, the galvanic action very strong, although not sufficient to produce an image direct without development, the strengthening of the electric current hy means of the developer does not produce a deposition of metallic silver in the same way as in the ordinary electrotype process, where a very strong electric current fails to reproduce a regular metallic deposit; the effect produced with an over-exposed plate is thus explained.

"If a sensitised plate, after exposure to light, is subjected to the action of a voltaic battery, a precipitaton of metallic silver is brought about on those parts of the plate which have been affected by light, and this reduction subsequently covers the whole of the plate, the galvanic action exerting the same power as that of light."

In THE BRITISH JOURNAL OF PHOTOGRAPHY, of July 31, 1868, Carey Lea describes some experiments, in which for the first time he took into account silver hromide, but comes to precisely the same consion, namely, that the action of light is physical, and not chemical.

W. B. Bolton's theory has already been referred to, and his article will be found on page 397 of THE BRITISH JOURNAL OF PHOTOGRAPHY for 1870. In this year Schnause brings forward the theory that there are two kinds of silver iodide, one not actinic, the other actinic.

In 1871, in vol. iv., page 343, of the *Berichten der deutschen Chem. Gesellschaft*, appeared a paper by Schultz-Sellack, which, however, beyond including a statement as to the different spectrum sensitiveness of the various silver salts, contains little that adds to the arguments on either side.

It was my intention, when commencing these notes, to abstract the principal papers on this subject, but I now see that they will need more than one article to do thoroughly. I can, therefore, only conclude here by drawing attention to one paper, though out of chronological order, which was read by Captain Abney, before the Photographic Society, which appears in the *Photo News*, June 12, 1885, when the lecturer exhibited a sample of subchloride of silver which, by analysis, showed that the proportion of Ag to Cl was within one per cent. of the fractional amounts required for Ag_2Cl. This was prepared by Dr. Hodgkinson, Professor of Chemistry at the Royal Military Academy at Woolwich. A. D. PRETZL.

PHOTOGRAPHY AND POLYTECHNICS.

POLYTECHNICS were originally established to impart technical education pure and simple, the main object of the promoters being to instruct apprentices and journeymen in the technique and scientific principles underlying their trade. By such means it was hoped that the intelligence and general character of the workman would be greatly raised, thus improving his own condition and increasing his economic value to an employer, intelligence and sobriety having a commercial value above ignorance and irregular habits.

Had the original idea been strictly carried out, we should by this time have had little to fear from "made in Germany" scares, and German competition in general; but our present polytechnics have largely departed from the designs of the pioneers. It was soon found that instructing genuine workmen resulted in a pecuniary loss, and, to make technical education possible, it was necessary to widen its scope, so as to include other than apprentices and journeymen. In no trade has this been done to such an extent as in photography, the smallest polytechnic having a large photographic class.

In photography the polytechnics now set before them the threefold task of: (1) giving instruction in the scientific principles to apprentices and journeymen; (2) training persons in manipulation and technique, who have no serious intention of following the trade for a livelihood; (3) teaching the whole trade, or certain sections, in a course of lessons to take the place of the ordinary system of apprenticeship. The two latter objects have now become the main work of polytechnics, and the genuine workman has very little attention bestowed upon him. What instruction is given is mainly "cram" to pass some examination. With this enlargement of their operations, the polytechnics now claim the ability to turn out a thoroughly practical photographer after a twelvemonth's training, as proficient and able as one who has undergone three or four years' apprenticeship in the printing room or studio; and they follow this up by asserting that the apprenticeship system is out of date, too slow and unreliable to suit present-day methods of business. These claims, I consider, have no warrant in fact, and, as the methods they support have been used in manufacturing a number of ignorant photographic employers and ill-trained assistants, resulting in considerable injury to the whole profession, it will be well to show their fallacy, and, if possible, counteract the mischief already done.

Dealing first with the matter of instructing *bonâ-fide* assistants in the scientific principles of photography. Some years ago I was a polytechnic student. At that time my fellow-students, almost without exception, were photographic assistants, employed in business during the day. Our class numbered about a dozen, and we studied the whole range of photography, from the latent image to photographing the sun's corona; from astigmatism to the stannotype. Hardly a subject having a close relation to every-day matters was studied. It is needless to say that I have not been called upon to photograph the sun's corona, to make stannotypes, to correct astigmatism, nor investigate the latent image. In due time I received a beautifully lithographed certificate from the City and Guilds of London Institute, and felt that I had done something to be proud of, and that my children and children's children would also be proud of. That certificate has long been destroyed as useless lumber, because I afterwards recognised that it merely meant a certain amount of cramming, and had no practical value. Not a single employer in the trade will pay an assistant one farthing a week more in wages because he can show a City and Guilds certificate, for the economic value of an assistant to an employer depends, not upon what he knows, but upon what he can do. Of my fellow-students I can now count six out of the dozen, who are engaged in giving instruction on similar lines at the various polytechnics in and around London, and only one who has made any commercial success due entirely to the application of theoretical knowledge. Such a result would be regarded as a complete success by those who believe in cramming scientific knowledge with a view to passing examinations; but to me it means failure, proving, as it does, that mere acquisition of knowledge has taken the place of the application of knowledge, upon which commercial success depends. A too close a study of the purely scientific is extremely likely to draw away the attention of the student from the mundane and practical; for this reason, a leading photographer will not engage a City and Guilds man, for, as he says, "such men are too fond of experimenting at my expense." Indiscriminate theoretical teaching is of little use in raising the economic value of a workman, since the value of theory to any man depends upon his ability for putting theory into practice, and this is a very rare gift. To study the theory of the latent image is a harmless occupation for an assistant, but his time would be much better employed in striving to develop the latent image into a better negative than others can develop. All the theory will not aid him to do this, for men could develop images long before they had formulated a theory. As Ruskin remarks on the same matter, "The principle of chemical equivalents, beautiful as it is, matters far less to a peasant boy, and even to most sons of gentlemen, than their knowing how to find whether the water is wholesome in the back-kitchen cistern, or whether the seven-acre field wants sand or chalk." Likewise, in photography, it must be recognised that theoretical knowledge is but supplementary, and can in no way make up for a deficiency in technique and the applications, or art, of what is to be learned.

The second action of the polytechnics—giving instruction to persons having no serious intention of following photography as an occupation—has done considerable harm to the profession, and to find a remedy is by no means an easy task. It injures both employers and assistants by making

competition more severe, flooding the market with bad and indifferent work, worthless assistants, and reducing prices, profits, and wages to a minimum. A person having no knowledge of photography, by paying a few pounds to some polytechnic, can receive instruction in all branches. He turns out a few decent negatives and prints, and, inflated with success, imagines himself a competent photographer. Photography being a most attractive profession, the chances are that, if such a person has a little money, he will forsake his own occupation and rush headlong into photography, buoyed up with the false rumours of little work and enormous profits which are prevalent. A business is started in opposition to some established photographer, but many weeks do not elapse before he discovers that something is wrong, three and four resittings become common, proofs are taken and no orders received, and things generally go to the bad. To save himself, a reduction in prices all round takes place, and a temporary success is achieved by taking the custom of others. In many neighbourhoods such tactics are successful, the outsider manages to survive until greater experience improves the quality of his work. The success is obtained by the permanent reduction of prices, and from such a fall they are not likely to recover. In other localities such men will go down, for none will buy their indifferent portraits. An instance of the kind came under my notice. A man of this class started a business, having scarcely any opposition, but failed solely through bad work. In the same place two photographers from first-class houses are now firmly established.

If the class-trained man has not the means of starting a business, he will endeavour to find an engagement as an assistant, being willing to hire his services for a wage which experienced men cannot possibly accept. In his ignorance of the trade, he cannot judge all the factors which operate in deciding what is a fair wage in the open market, and, as a consequence, he generally under or over-estimates the price of his services. The low salaries induce some to engage, thinking they may gain on the transaction; and others, looking at the high salaries demanded, decide that the men must be able, or they would not have the confidence to ask for such high wages. Both are deceived, for the assistants have no just estimate of their own commercial value to an employer, often proving worth much less than even the lowest salary demanded. Photographic assistants cannot be put outside of the law of supply and demand, and with them, as with others, a fair day's work is worth a fair day's pay.

Coming to the third point, that of supplanting the apprenticeship system by a method of technical training, this, on the surface, looks plausible, but experience is daily proving its inferiority to the older system. The employer is finding that, in engaging an assistant from the technical school, he is incurring a loss both of time and material, because, on leaving the school, the assistant's training has practically to commence again, to give him an insight into the details of commercial production. In addition, he has to be broken of a certain leisurely style of going about his work, the class system failing to educate a workman in that quickness combined with precision which is essential when work is to be done at a profit. In photography, besides the acquisition of skill, there is needed a cultivation of taste, and in training apprentices it will be found that it requires incessant attention to awaken and impress upon the mind a preference for the superior above the inferior, whether it be in the tone of a print, the pose of a limb, or the retouching of a negative. Individual attention is necessary for such cultivation, and it cannot be properly attained by any mode of class instruction, the teacher being unable to study the peculiarities of each student, and treat them accordingly.

Imitation is also a fruitful source from which to acquire skill, and it can only be utilised by an apprentice being in daily contact with a capable and experienced worker. If left to himself, a learner will use his own methods, and in general these are not the best nor the most economical from an employer's point of view.

Constant practice, close watching to prevent a clumsy or wrong method, and some means of bringing pressure to bear to avoid careless and slovenly habits, are of the first importance in training photographic apprentices, and in all these the polytechnic system is lacking. Hence, when a lad leaves the technical school and enters a business house, it means that all this must be undergone before he is of any commercial value to his employer. The lad must unlearn his previous knowledge, because it was acquired under conditions quite foreign to those which prevail in the profession, and this brings me to the chief merit of the apprenticeship system, and the glaring defect of all technical education—the matter of experience.

What do we call an experienced man, and why are employers willing to pay a man a salary according to his experience? An experienced man is one who has had ample opportunities of meeting and dealing with his work under many different conditions, and in encountering circumstances outside of the usual course of events. In printing, retouching, or operating, he can treat any case that may come up with facility, and it is precisely on the possession of this quality that his value to an employer depends. Apprenticeship is devoted to gaining a similar experience quite as much as in learning the practice of photography. To overlook this fact, and suppose that practice without experience is of much value, is to confuse photography with a photographer. A class-trained man would do very well if work in business followed the same lines as work in classes. As a matter of fact, it does not, but takes various forms, and to gain experience of these only a course of years will be found adequate. Twenty years will not exhaust them all, much less one year.

I have not touched upon what may be called "professional etiquette," that is, the treatment of sitters and studio conduct, perhaps the most important part of a photographer's training, without which success is almost impossible. The need of it was impressed upon me by a youth, brought up in a middle-class family, who, on being told to conduct a lady into the studio, shouted across the room, "Come on! Come on!!" leaving the lady in doubt as to whether this was a photographic form of salutation or a challenge to mortal combat. Now, no form of training other than the apprenticeship system would correct such deficiencies in a youth.

JOHN A. RANDALL.

TABER'S IMPROVEMENTS IN THE METHOD OF EMBOSSING PHOTOGRAPHS.

MR. F. A. TABER, of 609, Broderick-street, San Francisco, says:

"Heretofore, and before this, my invention, difficulty has been experienced in producing embossed photographs on account of the failure of the embossing mould and photograph to be embossed to register, which difficulty may be effectually overcome by the use of the process, which I will now describe by the aid of the accompanying drawings of which—

Fig. 1.



"Fig. I is a view of a photographic negative with guide or register marks thereon.

Fig. 2.



"Fig. 2 is a back view of the block with the embossing mould and register marks.

Fig. 3



"Fig. is a view of the photograph with the register marks cut out.

Fig. 4.



"Fig. 4 is a view of the mould with guide or register bars attached thereto.

"The invention relates to the embossing of photographs so that the surface of the figure or figures thereof will be raised or projected from the plain surface, and consists of providing on the photograph guide or register marks removed from the figures to be raised, transferring to the surface of a block in which the embossing mould is to be made the outline of the figure or figures to be embossed, and guide or register marks corresponding with those on the photograph; forming in the block a mould in accordance with the outline of the figure or figures thus transferred to the block, and adjusting a photograph having thereon the guide or register marks to the mould, in accordance with the register marks on the block and on the photograph, and pressing the photograph to the surface of the mould, and the various modifications hereinafter specified and set forth, as will more clearly appear hereafter.

"The usual manner in which I carry on this process is to provide on the negative, shown in fig. 1, the guide or register marks, R R, which may be produced by pasting on the negative strips of paper, or painting the same on the negative with any suitable material, so that they will show upon the sensitised paper on which the prints or photographs are made. The surface of the block to be used as a mould is sensitised, and the reverse of the negative A is printed thereon, shown in fig. 2, and marked B, where the picture to be embossed is shown on its surface with the guide or register marks, R R. The embossing mould is now made in accordance with the picture on the block by hand engraving, or any appropriate means to such depth and to such degree of nicety of detail as may be desired. A photograph from the negative A is now made, and the same is trimmed so as to bring the register marks, R R, at the edge of the sheet. The photograph C, with the register marks thus trimmed, is placed on the embossing mould so that the register marks of C and the register marks of B will correspond. The photograph C is then fastened to the block D by any appropriate means so that it will retain its position on the block with the figure of the photograph directly coincident with the figure of the embossing mould. The photograph sheet, having preferably been moistened to soften it, a backing of soft and elastic material, such as rubber sponge, is applied to the back of the photograph, and the whole is subjected to pressure, whereby the rubber sponge forces the photograph into conformity with the embossing mould, giving to the surface of the photograph the contour of the mould. If desired, the face of the block B may be provided with guide bars or frame, as shown at D in fig. 4, where they are put on in accordance with the guide or register marks. When a frame of this character is used on the face of the mould block, the photographs to be moulded should be trimmed in accordance with the register marks on them, which will make the edges of the photograph prints correspond with the frame D on the mould block, causing the photograph of the figures to correspond with the mould when they are in the frame D.

"I do not wish to limit my invention to the particular manner above described of carrying the same into effect, as good results may be obtained by drawing the outlines to be moulded for a photograph, as shown in fig. I, on a piece of transparent paper or other like material placed over the same, and transferring the outline thus made to the block B by placing on the block B a piece of carbon paper, and placing over that the tracing of the photograph face down, when, by following the outlines on the tracing paper with a pencil or like instrument, the lines will be transferred to the block through the medium of the carbon paper placed thereon, the guide marks R R, being preferably placed on the block at the same time.

"One of the advantages of this way of carrying on my invention is that it may be applied to any photograph without the necessity of having the negative, or more than one copy of the photograph to make a proper mould to emboss the photograph.

"It is manifest that, instead of placing a guide or register mark on the negative, the edge of the negative may be used as the guide or register mark, and be shown on the photograph and on the block in which the mould is made, and serve as a register mark without departing from the nature of my invention.

"I am aware that embossed photographs have been made before this my invention—a patent for a method of producing embossed photographs having been granted to me by Letters Patent, No. 21,422, A.D. 1895—but never before this my invention has a method been set forth whereby the photograph and mould may be made to readily register with accuracy, as is accomplished by the process here described.

The claims are:—

"(1) The method herein described of embossing photographs, which consists in providing on the photograph to be embossed guide or register marks removed from the figures to be embossed; transferring to the surface of a block in which the embossing mould is to be made the outlines of the figure or figures to be embossed, and the guide or register marks; forming in the block a mould in accordance with the outlines of the figure or figures thus transferred thereto; and adjusting a photograph, having thereon the guide or register marks, to the mould, in accordance with the register marks on the block and on the photograph; and pressing the photograph to the surface of the mould.

"(2) The method herein described of embossing photographs, which consists in providing on the photograph guide or register marks removed from the figures to be embossed; tracing on a transparent material placed over the photograph the outlines of the figures to be embossed, and the register marks; transferring to the surface of a block the outlines of the figures and register marks thus made, and cutting out the figures in accordance with the outline; adjusting a photograph having thereon guide or register marks to the mould, in accordance with the register marks on the block and on the photograph, and pressing the photograph to the surface of the mould."

THE ROYAL PHOTOGRAPHIC SOCIETY'S PROGRESS MEDAL.

THE Council of the Society (says the Society's *Journal*) have made the following regulations concerning the award of the progress medal:—

1. The Council of the Royal Photographic Society shall consider the award of one progress medal annually,

2. The progress medal of the Society may be awarded in recognition of any invention, research, or other publication which shall in the opinion of the Council have resulted in any important advance in the scientific or artistic development of photography.

3. The award shall be conducted in the following manner:—

(*a*) At the November Council meeting the names of nominees shall be duly proposed and seconded; the nominators handing in, in writing, a statement of the special work for consideration.

(*b*) At the December Council meeting the work of the nominees as already stated shall be discussed, and their names balloted out until only one remains.

(*c*) At their January meeting the Council shall, without discussion,

vote openly as to whether the medal shall be awarded. Votes received in writing from absent members are to be accepted. The medal shall not be awarded unless two thirds or a larger proportion of the recorded votes are in favour of its bestowal.

4. The above with the names of past recipients of the medal shall be published in the October number of the *Journal* in each year.

The medals have been awarded as follows:—1878, Captain W. de W. Abney, R.E.; 1881, W. Willis; 1882, L. Warnerke; 1883, W. B. Woodbury; 1884, Dr. J. M. Eder; 1890, Captain W. de W. Abney, C.B., R.E., F.R.S.; 1891, Colonel J. Waterhouse, R.E., I.S.C.; 1895, P. H. Emerson, B.A., M.B.; 1896, T. R. Dallmeyer, F.R.A.S.

THE TRAILL TAYLOR MEMORIAL.

A meeting of the General Committee of the Fund, to which all subscribers were invited, was held on Friday, November 6, at the Exhibition Gallery, 5A Pall Mall East. In the absence of Sir H. Trueman Wood, Mr. A. Haddon took the chair.

The Hon. Secretary announced that, up to that date, the total amount of subscriptions received had been 242*l.* 9*s.* 6*d.*, and that the expenses had been 13*l.* 8*l.* 2*d.*, the principal items being 8*l.* 5*s.* 10*d.* for postage and 3*l.* 17*s.* 6*d.* for printing. The balance in hand was 229*l.* 1*s.* 4*d.* He asked that two auditors be appointed to audit his accounts to date. Messrs. A. Clarke and H. W. Bennett were thereupon appointed.

The Hon. Secretary then said that, at the meeting of December last, at which it was resolved to raise a memorial to the late Mr. Traill Taylor, an Executive Committee was appointed to consider the form the memorial should take, and how the fund should be administered. That Executive Committee had held several meetings, and had drawn up a report; that present meeting was for the purpose of receiving and dealing with that report. He then read the Committee's report, and, after a long discussion, with certain amendments, it was adopted.

The articles of the report as amended were as follows:—

1. That the annual revenue of the fund be devoted to an award of a medal for a lecture on a subject connected with photography, and preferably embodying original research, to be known as the Traill Taylor Memorial Lecture.

2. That the fund be administered by a committee of ten London and ten country members. Two London and two country members to retire annually, and not to be eligible for re-election for twelve months. The annual retirement to be by lot until retirement by seniority of service can come into force. Any alteration in this clause to be effected only by the vote of at least four-fifths of the entire Committee.

3. The Committee to appoint a Secretary annually, not necessarily from their own body, who shall be *ex officio* a member of the Committee. The Secretary to hold office during the pleasure of the Committee.

4. That the fund be vested in two Trustees, to be chosen by the Committee. The Trustees to be *ex-officio* members of the Committee.

5. That a trust deed be executed embodying the above regulations.

It was a further recommendation that the first Committee be appointed by the General Committee.

A ballot then took place for the Committee, resulting as follows:—London members: Messrs. T. Bedding, R. C. Bayley, P. Everitt, A. Haddon, A. Mackie, E. J. Wall, H. Snowden Ward, W. D. Welford, H. Wilmer, and Sir H. Trueman Wood. Country members: Messrs. W. I. Chadwick (Manchester), W. Crooke (Edinburgh), Martin J. Harding (Shrewsbury), Geo. Mason (Glasgow), H. P. Robinson (Tunbridge Wells), A. Seaman (Chesterfield), John Stuart (Glasgow), H. Sturmey (Coventry), G. Watmough Webster (Chester), A. Werner (Dublin).

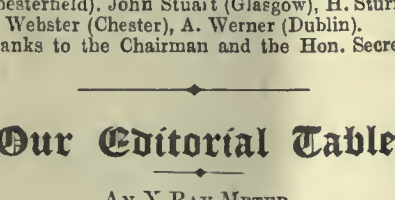
Votes of thanks to the Chairman and the Hon. Secretary closed the proceedings.

Our Editorial Table.

An X-Ray Meter.

Reynolds & Branson, Leeds.

This little instrument supplies a definite means of comparing the actinic power of the radiations emanating from excited tubes used in



X-ray work. A quadrant of aluminium is made in concentric terraces, the thickness ranging from one to ten millimetres. By placing this meter between the excited tube and a phosphorescent screen, the thickness of aluminium which the rays can pass through can be seen on the screen. The meter, therefore, gives an easy method of comparing the intensity of the rays emitted by different tubes, and the same tubes at different times.

Les Rayons Röntgen.

By Charles Henry. Paris: Société d' Editions Scientifiques.

The author, in a series of short chapters, summarises, from an entirely French point of view, what had been done in the investigation of the mysterious radiations examined by Hertz, Lenard, and others, prior to Röntgen's discovery of the X rays, and devotes the remainder of his book to a discussion on some theoretical and practical aspects of those rays.

Manuel du Microscope.

By Dr. A. Miquet. Paris: Société d'Editions Scientifiques.

This work is addressed to beginners in microscopy, a fact which explains the circumstance that so important a subject is dismissed in about fifty pages. However, much useful matter is compressed in the concisely written chapters which treat of the mechanical and optical parts of the microscope and its accessories, and other topics germane to the study of microscopy.

News and Notes.

The Watford Engineering Company, Watford, now make apparatus for portraiture fitted for acetylene gas as well as electric light.

Royal Photographic Society.—Photo-mechanical Meeting, Tuesday, November 17, at 12, Hanover-square, at eight p.m. *Successful Half-tone Illustration*, by Mr. Eddington.

The Christmas lectures at the Royal Institution will be on *Visible and Invisible Light*, by Professor S. P. Thompson, F.R.S. At the London Institution Professor J. A. Fleming will deliver a short Christmas course on *Rays of Light: New and Old.*

Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, November 18. Mr. Thomas Fall will read a paper, entitled *Birds and Animal Life.* Lantern illustrations.

The Bristol Exhibition.—The Hon. Secretary writes: "We should be much obliged if you would kindly announce in your next issue, that entries must reach us for our Exhibition not later than December 1. You will, I am sure, be glad to hear that we have every prospect of a very successful Exhibition, and that entries are coming really well."

Napoleon Sarony, the well-known photographic artist, was (according to a Dalziel's telegram from New York) found dead in his bed on Monday morning from apoplexy. He had evidently died while asleep. His wife tried to awaken him, and discovered that life was extinct. Mr. Sarony was born in Quebec. He went to England and settled in Birmingham in 1866 for a time, and then came to the United States.

The Woodford Photographic Society's Exhibition of members' work will be held at the Coffee Tavern, George-lane, South Woodford, on Saturday, the 21st inst., from 4 to 9.30 p.m., when the Society will be glad to see any of their photographic friends who may like to pay them a visit. The Secretary (Mr. F. E. Emler), 1, Florence-villas, Chelmsford-road, Woodford, will be glad to send a card of invitation to any one who may like to have one.

An Art Delirium.—He uttered a cry of horror. "Take it away!" he yelled. "Take it away! I'll never touch another drop as long as I live." It was several minutes before he dared look up again, but, when he did, he seemed a little reassured. "I never thought I would come to this," he said; "but I have learned a lesson, at any rate. From this moment I am a total abstainer." And, after all, it was nothing but a Beardsley poster that he had seen.

"'Cosmos'—the esteemed mystery whose periodical 'Jottings' serve to diversify contemporary pages—hits the right nail on the head! He asks," says the *Optician*, "how it comes about that the Judges, who officiated at the Royal Photographic Society's Exhibition, passed over the Dallmeyer-Aldis stigmatic portrait lens, without due recognition of its great merit. Evidently a blunder has been committed, and those responsible are morally bound to offer some explanation and amends."

The Lumière Kinematograph.—In reply to numerous inquiries, we are able to state that Messrs. Fuerst Bros., of 17, Philpot-lane, E.C., are now in a position to take orders for the Lumière Kinematograph. The apparatus, which will be ready for delivery in the forthcoming spring, includes the camera, lens, stand, film, &c., for taking the negatives; the necessary apparatus, &c., for making the positives; and a complete optical-lantern system for projecting the transparencies. Films of positive pictures, varied as regards subjects, will also be supplied. Messrs. Fuerst are the agents for Great Britain, the Colonies, and India.

ACETYLENE EXPLOSION AT GRIMSBY.—A few days ago a loud explosion was heard in the shop of Mr. Dewing, chemist, Grimsby, and a curious crowd quickly collected. The accident turned out to be an explosion of acetylene gas, which Mr. Dewing was using for photographic purposes. While the apparatus was being lighted the main became ignited and blew out the top of the cylinder, which, striking Mr. Dewing severely on the shoulder, flew upward and pierced the ceiling. Mr. Dewing was rather severely bruised and burnt, and for a moment became unconscious. An assistant standing near escaped entirely unhurt. The damage done in the shop was very slight.

SOCIETY OF ARTS.—The opening meeting of the one hundred and forty-third session will be held on Wednesday evening, November 18, at eight p.m., when an address will be delivered by Major-General Sir Owen Tudor Burne, K.C.S.I., C.I.E., Chairman of the Council. The subject of the address will be *India: its Arts, Manufactures, and Commerce.* At the subsequent meetings before Christmas, the following papers will be read:—*Recent Developments in Mechanical Road Carriages*, by W. Worby Beaumont, M.Inst.C.E.; *The Teaching of Economics*, by W. A. S. Hewins, M.A.; *Mining at Great Depths*, by Bennett H. Brough, Assoc.R.S.M.; *The Chamber Music of Purcell, Handel, and Bach* (with illustrations on the original instruments for which it was written) by Arnold Dolmetsch.

LIFE IN TRIPOLI.—Mr. G. E. Thompson, of Liverpool, gave a lantern lecture at the Pall Mall Exhibition, on the 2nd inst., upon this subject to a crowded and appreciative audience. Life under the dazzling sunshine and intense blue sky of the East is about as different as anything can be from ours in England at the present time, and Mr. G. E. Thompson's beautiful series of photographs of Tripoli, its people, animals, palms, and great desert, had a pleasing novelty about it. The pictures were largely instantaneous, showing the inhabitants at their usual avocations. There was the great crowded weekly market on the shore of the almost tideless Mediterranean. There were street scenes, shops, mosques, and orange gardens. The disdainful camel figured often, and the photographs taken on the great desert were not the least interesting of the series. Mr. Thompson described how he reached Tripoli, staying a week at a comfortable Italian hotel during the early springtime. The lecture was replete with useful and amusing information, and was much appreciated.

THE PRIZE POSTER.—Once upon a time a green cat sat under a blue rose bush, devouring a red mouse. This cat did business in the south-east corner of a poster, while at the upper left grew a vague, lavender-faced maiden against a lemon sky. Her hair and eyes were the colour of the cat; also the shirt front of the dim-featured, alizarine-faced youth beside her. The purple grass hesitated driftily about them. In the distance a vermilion sail was cutting a wide swath against a mauve moon. Something akin to intelligence azured the reflection of the far-faced boy. "The washing is on the line," he grieved. "The lavender eyelids fell. "Out of the intense comes——" She hesitated, and the rest was lost in the cream-coloured silence. The cat sped a gobelin-blue yeowl, such as thrive only in Poster Land. The tragedy was finished. The prize poster was ready for the contest. I do not know what it means. Neither does the artist. But those who have gone deeply into the heart of things, who have solved the elusive far-ness of Browning and Beardsley, they—they will understand.—*Detroit Free Press.*

CHEAP OXYGEN.—"It is reported from America," says a contemporary, "that the cheap production of oxygen on a commercial scale has been solved, and that oxygen gas is being manufactured at 3*d.* per 1000 feet, which, if true, may have very far-reaching effects. Air is blown through a mixture of caustic soda and black oxide of manganese, the bath being maintained at a temperature of between 500° and 600° Fahr., when the atmospheric oxygen is absorbed and manganate of soda formed, the nitrogen passing off unchanged. When the formation of manganate of soda is complete, the air is stopped, and a current of steam is forced through, by which means the manganate is decomposed into oxide of manganese and caustic soda again with the liberation of oxygen gas, which can be collected. This process of the alternate formation and decomposition of manganate is not by any means new; but, owing to the tendency of the alkaline manganates under the action of steam to form a viscid mass, and so prevent the intimate contact of air and steam with the chemicals used, it has never been a commercial success. The present inventor, however, claims to have completely overcome this difficulty by so regulating the constituents and the temperature to obtain a fluid manganate when the oxygen is being liberated."

VITAL (!) PHOTOGRAPHY.—Says our contemporary, the *Daily Chronicle*: "Dr. Baraduc, whose experiments in what he calls mental or vital photography we noticed some weeks ago, has recently been pushing forward his researches in a fashion that would in this country attract the attention of the Society for the Prevention of Cruelty to Animals. This amiable physiologist 'crucifies' a pigeon, that is to say, he fastens it to a board, with its wings and legs firmly secured, and then places a sensitised plate on its breast. So long as it struggles for freedom, and throws off vital force, the plate, on being developed, shows a number of little round spots, much like those on a sheet of paper at which a shot-gun has been fired. When the bird gets used to its position, or is too tired to exert itself, the images recorded are cloudy or striated. The next step is to cut the pigeon's throat, the picture of its death agony taking the form of curling eddies, such as the doctor has observed when the plate is applied to suffering human limbs. As soon as death has supervened, no photographic effect can be procured, and a sheer blank is the only result. It is difficult to see what useful information can be derived from this combination of cruelty and absurdity. Admitting that the changes in the sensitised plate are really records of vital force, and not of other more obvious physical agencies, all the phenomena can be observed in the human subject without causing the slightest pain, much less wantonly sacrificing the humblest life."

PHOTOGRAPHY OF THE SOLAR CORONA.—Rev. T. E. Espin writes to the *English Mechanic*: "In accordance with my promise, I have made some experiments to try and confirm Mr. Packer's results. A wooden box was used as a camera; a pinhole was also used. The plate was placed in a cardboard box, the bottom of which was removed, and a thin plate of amalgamated zinc let in. The sensitised plate was in contact with the zinc. The sun's image was allowed to trail across. The plate was carefully developed, but nothing was found on it. In the next experiment, a piece of lead, on which was deposited a film of copper, was exposed to the image of the pinhole, the sun being again allowed to trail. This was removed to the dark room, and a sensitised plate laid on it, and left for two hours. On development nothing was found. In the third experiment a half-plate camera was used, the lens removed, and a pinhole substituted. This plate was enclosed in a sheet of tinfoil, which exactly went round it once. This was inserted in the carrier, and, being placed in the camera, the sun's image was allowed to trail over it. It was then left two hours in its sheath; on development nothing was found. These three experiments are all I have yet had the time to make. It may be well to observe in passing that if the sun's image, as formed by a pinhole, is received on a white piece of paper, it has what appears to be coronal structures, but which rotate as the pinhole is turned round. I have used amalgamated zinc, and a pure film of copper, because the X-ray work showed me that these affected a sensitised plate more decidedly than any other metals I have tried."

MADE BALD BY X RAYS.—Mr. William Levy, of Eau Clair, Wis., who recently had an X-ray examination of his skull made by Professor Fred S. Jones at the physical laboratory of the Minnesota State University, had an experience in consequence not generally supposed to accompany the process, says the St. Paul *Dispatch*. Levy was shot in the head about ten years ago. The bullet has been somewhere in his head ever since, and in July he made up his mind to have it located. Accordingly he came up, and sat from eight o'clock in the morning till ten at night for a Röntgen-ray picture of his head. The bullet had passed into his skull just above the left ear, going towards the back of the head. The doctors wrapped his head in wires, which were definitely located. A picture was taken through the skull from the front towards the back of the head, the tube from which the rays radiated being for this purpose placed inside his mouth. The picture thus secured showed the bullet very distinctly to be lying at the junction of two of the wires which crossed right under the occipital bone. A very strong current, about 100,000 volts, had been passed through the tube in making the exposure. The next day Mr. Levy began to notice a peculiar effect on his skin wherever it had been most exposed to the rays, and the hair on the right side of his head, which had been near the wire, began to fall out. In a few days the right side of his head was perfectly bald, his right ear had swollen to twice its natural size, and presented the same appearance as if very badly frozen. Sores were visible on his head, his mouth and throat were blistered so that he could not eat solid food for three weeks, and his lips were swollen, cracked, and bleeding. Mr. Levy has recovered from the effects of the rays, but still has half a bald head. He intends to have the investigations carried further, and the bullet removed, but nothing is stated on the subject of hair restoration.

LECTURE ON THE RÖNTGEN RAYS.—At the weekly meeting of the Manchester Arts Club on Tuesday, November 3, Mr. W. I. Chadwick delivered an address on the Röntgen Rays, with an abundance of illustrations, experiments, and lantern views. He pointed out that many of the scientific discoveries of the present century now in general use had ceased to be regarded by the public with any particular interest. Towards the end of last year, not only the public, but the scientific minds all over the world, were aroused to the highest pitch of enthusiasm ever known in the history of science by the discovery of Professor Röntgen of the presence of an agent which would pass through opaque bodies and affect a photographic plate behind them. As everybody knows, a photograph is produced by the agency of light, and opaque bodies are those which suppress the passage of light. To say, then, that photographs can be made through opaque bodies is as paradoxical as to say that opaque is transparent, and this appeals to our natural curiosity. Although this new agent has been examined in nearly every scientific laboratory in the world, its real nature has not yet been defined. Its action on a photographic plate and its power to excite vision under certain circumstances points to a form or condition of light, but its refusal to conform to other well-known laws of light, and its passage through opaque bodies, is against the present accepted theory of light. It is, or it was, admitted to be a radiation of some kind and, until we can discover something more definite about it, Professor Röntgen has called it X rays, X being the unknown quantity in mathematics. The practical application of the discovery as an aid to surgery was demonstrated at its birth, and too much must not be expected from an infant so young. Franklin, rejoicing at his success in bringing lightning from the clouds to the earth by means of his kite string, was asked by somebody, "Well, what good is it?" To that he replied, "What good is a baby? It will grow, and you must make it of use." Since then Franklin's baby has grown, as we know, and so Röntgen's baby will grow. Even now it gives promise of most important communications before long. That the X rays is a movement establishes either a movement of particles or a mode of motion. If the movement be in the ether as a transverse vibration of the nature of light, then light is something different or additional to that which we at present understand it to be. That is just what modern physicists suspect, and Röntgen's discovery is another link in the chain which is fast drawing together light and electricity as one. To the question as to what electricity is, the safest reply would be, that we do not exactly know. It is quite true that we make some use of it, but in most cases a very extravagant one, when we consider the purpose for which we intend it. For example, for every 100 pounds worth of energy inside a lamp, disregarding the energy expended to get it there, we have only four per cent. useful for lighting purposes—the other ninety-six is wasted in the form of heat, a thing we do not want for illuminating purposes. Mr. Chadwick made a few references to the production of light without heat—something not yet achieved by man, although a certain beetle does it. The nature of light Mr. Chadwick illustrated by a number of mechanical appliances and various experiments. Showing some views upon the screen, he remarked that the spectrum is the result of certain vibrations to which our visual organs respond. There are, however, other vibrations to which our eyes are not sensitive, and

amongst these (and beyond those producing the sensation of violet) may possibly be found the X rays. By a series of brilliant and intensely interesting experiments the lecturer illustrated phosphorescence and fluorescence. In describing the electrical appliances used to evoke the presence of the X rays, he said the battery was an arrangement for propagating electrical energy. The coil used in connexion with it increased the electro-motive force. The nature of electrical discharges in different media and in vacua was illustrated by a large number of Crookes' and other radiant-matter tubes—radiant matter being an ultra-gaseous state in which molecules were free to move, like grains of sand in a bottle. When these molecules were driven against the sides of an exhausted tube, they produced a vibration causing what is known as fluorescence. The nature of this bombardment of particles or cathode rays inside the tube was shown to be quite different to the rays outside the tube, and these outside rays are the mysterious Röntgen or X rays. After showing various objects visible to the entire audience, though placed behind thick wooden boards, a radiograph was taken and exhibited by the projection lantern. Then followed a number of radiographs taken by Mr. Chadwick for surgical purposes. His explanations were wonderfully interesting. He told of one case where a man shot himself in the hand. The surgeon who was to operate, the man himself, and Mr. Chadwick knew there were pellets imbedded in the hand, but they did not know that there were no fewer than twenty-four shots. Under ordinary circumstances, the surgeon might have removed twenty-two, and the two remaining might have caused serious trouble afterwards. On the other hand, he might have removed twenty-four, and still have been "fishing" for more. Owing to the radiograph taken of the hand, he knew the exact number of pieces of lead he had to extract. In another case, a man stepped on to a needle, but it was only by means of the radiograph that it was found that the needle had broken into three pieces on entering the foot. Early this year it would have been considered an achievement to have shown such things as the humerus or the ulnar in the arm, but, at the present time, the collar-bone and the spine were quite ordinary things to show. The X rays had recently been used for detecting stone in the kidney, and this was only another proof of the rapid advance of the discovery.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

November.	Name of Society.	Subject.
16	Bradford	*A Tour in Italy and the Riviera.* Rev. J. Beanland.
16	Camera Club	*The Eye Considered as an Electrical Organ.* Dr. Lindsay Johnson.
16	Ealing	*Lantern Slides and their Production.* E. Dockree.
16	North Middlesex	*Chemical Symbols.* R. Child Bayley.
16	Richmond	*Making a Negative.* G. Ardaseer.
17	Birmingham Photo. Society	*The Treatment of Figures.* Rev. F. C. Lambert.
17	Gospel Oak	Improving Negatives, and Printing Dodges.
17	Hackney	Annual Exhibition.
17	Isle of Thanet	*Pictorial Photography.* A. Horsley Hinton.
17	Leeds Photo. Society	*Air Brush Demonstration.* R. Bownas.
17	Lewisham	*Practical Pictorial Photography.* A. Horsley Hinton.
17	Royal Photographic Society	*Successful Half-tone Illustration.* Mr. Eddington.
18	Borough Polytechnic	*Remarks on the Improvement of Landscapes by Retouching.* Roland C. Whiting.
18	Croydon Camera Club	*Picture Making with the Camera.* A. Horsley Hinton.
18	Leeds Camera Club	*A Holiday Tour through Germany.* A. Homburg.—Demonstration with Stockwell's Patent Uno Dissolving Lantern.
18	Leytonstone	*Reminiscences of Travel.* G. E. Cox.
18	Photographic Club	*Birds and Animal Life.* Thomas Fall.
18	Southport	Annual General Meeting.
19	Ashton-under-Lyne	*Lantern-slide Making.* Walter Leigh.
19	Camera Club	*In Eastern Lands.* E. R. Ashton.
19	Leigh	Competition: Outdoor Photography.
19	London and Provincial	Lantern Night. L. Medland.
19	Putney	*Architectural Photography.* H. W. Bennett, F.R.P.S.
19	West Surrey	Demonstration: Toning. Mr. Bulbeck.
19	Woodford	*Intensification and Reduction.* J. McIntosh.
20	Aintree and District	Exhibition Matters.
20	Croydon Microscopical	Reception of Photographs, &c., for *Soirés.*
20	North Middlesex	Date for Sending in Pictures for Exhibition.
20	Wolverhampton	Demonstration of Messrs. Wellington & Ward's Specialities. J. Gale.

ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 10,—Ordinary Meeting,—The Right Hon. the Earl of Crawford, K.T., in the chair.

THE ALPINE CLUB'S EXHIBITION.

A letter was read from the Secretary of the Alpine Club, inviting members of the Society to contribute to an exhibition of Alpine photographs to take place in December next. Members proposing to exhibit were requested to communicate with the Club as early as possible.

THREE-COLOUR PRINTING: DR. JOLY'S PROCESS.

Mr. E. J. Wall showed and presented to the Society the first specimens which had been shown in England of the application of Dr. Joly's method of colour photography to photo-mechanical work.

Mr. T. BOLAS thought it only fair to mention that the credit for the fundamental principle of this process was due to M. Louis Ducros du Hauron, who had described and discussed the essential points in his book published in 1869.

EFFECTS OF THE X RAYS.

The Assistant Secretary (Mr. R. Child Bayley), in response to a request for "objects of interest," showed his right hand, which he had used in demonstrating the X rays to the visitors to the Exhibition, and which had thus been exposed to a fairly strong radiation for about an hour each day, and had acquired a distinctly darker colour than the other hand.

Mr. J. SPILLER had used one of his hands in a similar manner for half an hour at the opening *soirée*, and, later in the evening, experienced a burning sensation, as if the hand had been scalded.

Mr. WILSON NOBLE mentioned a case, reported in the *British Medical Journal*, in which dermatitis had been induced by an exposure of an hour and a half at a distance of one inch from the tube.

Mr. J. CADETT suggested that these and other instances referred to might have arisen from poisoning with platinum salts in handling fluorescent screens, and mentioned a case of a young lady engaged in photographic printing whose skin had been very seriously affected by the use of platinotype paper.

Mr. C. E. HEARSON thought the effects in question might be due to decomposition of the water in the tissues of the body, owing to an induced state brought about by the high tension of the currents in the coils, oxygen or hydrogen being set free according to the direction of the current.

Mr. WILSON NORLE had noticed that an enlarged heart had greatly diminished in size during the period of exposure to the rays.

MEASUREMENT OF LIGHT REFLECTED FROM PRINTS.

Mr. H. CHAPMAN JONES (Hon. Secretary) read a paper describing *A New Form of Apparatus for Measuring the Light reflected from Prints.* As in his apparatus for measuring the densities of plates (brought before the Society in December last), his aim had been to make an instrument as simple as possible and complete in itself, comparable in its completeness and unity with a microscope or a spectroscope. The measuring of the light transmitted by plates and reflected by prints was to the scientific photographer what weighing was to the chemist, and he expressed the hope that the introduction of simpler means for making such measurements would cause quantitative photography to become more general. The apparatus was described as follows: The source of light is a Welsbach burner, and two mirrors—one on each side of it—give two beams of light, which pass through two openings into a velvet-lined box and illuminate the patch of paper to be tested and a comparison patch. A shadow rod is used, as in Rumford's method of photometry, so that each beam illuminates only one of the patches. The illumination of the lighter patch is reduced by drawing the mirror back until the two are of equal brightness. Thus the apparatus did not measure the absolute proportion of light reflected, but the proportion as compared with that reflected from the white paper or whatever might be taken as the standard. Mr. Chapman Jones exhibited the instrument and very fully described it and also some experimental measurements made by its aid, and stated that, as he had many inquiries concerning his density measurer, he had made arrangements with Messrs. Baird & Tatlock, who would be prepared to supply that apparatus and also the one now described, in both of which there would be certain mirror improvements that experience had shown to be desirable.

Mr. W. E. DEBENHAM suggested that the movable mirror should be fitted with a rack and pinion, so as to make it self-centering as it travelled along, instead of readjusting it by hand for each observation.

Mr. MOTE did not think the two sides of an incandescent mantle could be depended upon to give exactly the same light, and he suggested that acetylene gas would probably be a more trustworthy illuminant.

Mr. CHAPMAN JONES said he had unsuccessfully tried two or three ways of making the mirror self-adjusting, and would be very glad if some one would tell him exactly how it could be done; he found, however, that there was really no difficulty in using the instrument as it stood. There was the possibility of variation in the incandescent light, but one would always test the zero point before starting, and it would thus be ascertained whether the burner was giving a symmetrical light. He had not tried acetylene, but would do so.

A vote of thanks was passed to the Hon. Secretary for his paper, and he then read a communication by Mr. CHARLES E. BENHAM on

A THEORY OF THE RÖNTGEN PHENOMENA.

In the early days of the science of magnetism, Mr. Benham wrote, it was imagined that some sort of rays of force proceeded from the magnet to the attracted iron. The conception of magnetic influence as a radiation was exploded by Coulomb's experiments, and the writer suggested that the Röntgen "field" would probably soon be spoken of rather than the Röntgen rays, and that it would be found that the influence was akin to induction and not to the emanation of waves like those from a luminous object or a reflector. There was some *à priori* evidence of, at any rate, a partial correspondence between the transparency and opacity of various substances in the Röntgen field on the one hand, and in the magnetic field on the other, for the position of a needle in the hand might be indicated not only by "the new photography," but by simply placing a card over the hand, with a powerful magnet underneath, and then strewing iron filings on the card. The filings were too unwieldy, as compared with molecules, to have their movements modified by the varied paramagnetic or diamagnetic qualities of the tissues of the body, so as to show bones or internal structure, but they, nevertheless, so to speak, "photographed" the needle. He did not suggest that the Röntgen field and

the magnetic field were the same, but that the phenomena had features in common, and that the one might serve to illustrate the other seemed to him more than probable, and, at the same time, the analogy appeared to offer some foundation for a plausible hypothesis regarding the so-called new light.

Mr. CADETT had experimented in the direction of trying the effect of magnetism on a photographic plate, but could not find the slightest trace of action. He thought the suggestion that the X rays should be called a "field," similar to the magnetic field, was not a very happy one.

Mr. TOWNSEND had made a large number of experiments with a powerful electro-magnet, and could not find any action on the photographic plate.

The CHAIRMAN mentioned an experiment performed at a recent *conversazione* of the Royal Society. An ordinary bulb was shown in which two needles had been inserted in front of the cathode, and no particular effect resulted from the turning on of the current; when a magnet was brought near the tube, however, both the needles threw shadows on the glass, and the shadows moved as the magnet was turned in either direction. A very slight change in the pressure within the tube caused the phenomenon to cease altogether.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 5,—Mr. A. Mackie in the chair.

Mr. Walter E. Woodbury, the Editor of the *Photographic Times*, of New York, who was present, was welcomed.

A considerable portion of the evening, which had been set aside for a print competition, was taken up in discussing the regulations concerning the competition for papers, prints, and slides, instituted by Mr. Henderson, who had provided a sum of five guineas for the purpose. The competition was originally intended for the 1895-96 session, but, not meeting with the support expected, the period was extended to another year, that is, the present year. The point under discussion was whether the same rules applied, or whether they dropped with the expiration of the first year, and as to the legality of the resolution passed on October 22 with reference to the grant. Eventually this resolution was rescinded, leaving the matter in the hands of the Committee.

Mr. E. J. WALL then proposed that Judges, who should be members of the Association, be appointed for this competition, their number being limited to three.

A ballot was taken, which resulted in the election of Messrs. Robert Beckett, A. Mackie, and E. J. Wall.

A fair number of prints were entered for the competition arranged for the evening, and Messrs. Beckett, Wall, and W. E. Woodbury were requested to act as Judges; but, after an examination of the pictures, they reported their inability to make any award.

PHOTOGRAPHIC CLUB.

NOVEMBER 4,—Mr. Frank Haes, one of the Trustees, was in the chair.

The balance-sheet showed a credit balance of 47*l.* odd to current account, and a sum of 160*l.* invested in India stock as a reserve fund. The Committee's report referred to a successful year's work, and was adopted—as was the balance-sheet—*nem. con.*

Mr. Horace Wilmer retired from the Committee in accordance with the rules, which only permits three consecutive years' service as a Committeeman. The new members of the Committee were Messrs. R. P. Drage, Alex. Mackie, and W. D. Welford. Mr. F. A. Bridge resumed his former post of Hon. Secretary and Treasurer, and Mr. Herbert Fry was elected Recorder. All other officers as before.

The SECRETARY announced that the Committee had decided to institute a Trade Night, in order to provide an opportunity for the display and demonstration of new and interesting manufactures to the members. The first three trade nights will take place upon the first Wednesdays in January, March, and May respectively.

Brixton and Clapham Camera Club.—November 3, Mr. J. W. Coade (President) in the chair.—Subject,

AN HOUR WITH THE LANTERN MICROSCOPE,

by Mr. R. G. MASON (Club Lanternist). There was a large attendance, ten new members being elected, and three more nominated. The Club does not always devote its meetings to strictly photographic matters, such as the action of developers and toning baths, or even to "Art with a big A," but occasionally gets out of the usual routine with a fixture like the present. Mr. Mason's demonstration was really a natural history lecture, numerous mounted microscopical specimens of the insect and vegetable world being projected on the screen, and their peculiarities described. This was followed by the projection of living specimens taken from ponds in the locality, Mr. Mason remarking that the improvements of the County Council made his subjects increasingly difficult to find. However, he had got together a good selection of water mites, water fleas, and other aquatic insects, perhaps the most interesting exhibits being the circulation of blood as shown in the leg of a frog, and the water hydra stretching out its tentacles to capture its prey, and afterwards devouring the same, an exhibit so realistic as to produce cries of "shame" from a somewhat susceptible member of the audience. In conclusion, Mr. Mason received cordial thanks for demonstrating a branch of science so inviting in its photographic possibilities. On the table were specimens of collotype encaustic tiles; also a liberal supply of a useful booklet by Jules Fuerst, F.R.P.S., on *Modern Developers*.

North Middlesex Photographic Society.—November 9, Mr. J. McIntosh in the chair.—Mr. Samuel R. Schofield, 1, Highcroft-road, Hornsey Rise, N., was nominated for membership. Mr. E. J. WALL then proceeded to give a lecture on

THE SPECTROSCOPE.

He projected a spectrum on the lantern screen, and showed the effect of placing in the path of the rays different coloured glasses, which cut off different parts of the spectrum according to their colour and purity. A chart of the spectrum of the sun and various metals was shown, and their lines pointed out. A spectroscope was set upon the table, and the sodium line was seen in an ordinary spirit lamp by the members. He also showed a direct vision spectroscope. Some negatives, showing the effect of different screens on the spectrum, were put through the lantern, taken on ordinary and different makes of orthochromatic plates. The Burchett screen was shown to be wrong in theory, as it did not give the value of the green which was wanted in landscape work. In reply to a question by Mr. Cox, he recommended a screen of collodion dyed with uranine or naphthol yellow in preference to the commercial screens, about 1 part dye to 5000 of collodion. At the close of the lecture, a hearty vote of thanks was accorded to Mr. Wall. Mr. H. Stuart was elected chairman for the next meeting, when Mr. S. H. Fry will demonstrate *Home Preparation of Rough Bromide Paper*.

Richmond Camera Club.—On the 26th ult., Mr. Cembrano presided at a meeting which was but thinly attended—an unfortunate circumstance for the members who stayed away, as the evening was of exceptional interest. Mr. ALFRED WATKINS, inventor of the exposure meter which bears his name and of the eikronometer, lectured on

SYSTEMATIC DEVELOPMENT.

Mr. Watkins holds that the development of a negative proceeds by fixed rules, and that density is built up in a definite ratio from the first application of the developing agent to the moment when development is completed, and that, by noting the time which elapses between the application of the developer and the first appearance of the image, the proper time for stopping a development can be calculated to a nicety, regard being had, of course, to the nature of the developer. Mr. Watkins is master of his subject, and demonstrated his theory by a series of highly interesting experiments and lantern illustrations.

ON the 2nd inst. (Mr. Purcell in the chair) there was a good attendance. Members' slides were shown, some excellent specimens amongst them. Mr. Gibson showed a series of views in the Trossachs; Mr. Skone James, some from Brecon; Mr. Purcell, some French and Italian snap-shots; Mr. Davis, Alpine scenes; Mr. Bickerton, some good architectural slides; and Mr. Dimsdale some pretty bits of Devonshire scenery.

South London Photographic Society.—At the last ordinary meeting, held at Hanover Hall, Hanover park, Peckham, the President (Mr. F. W. Edwards) in the chair, Mr. A. P. Wire, of the Leytoustone Camera Club, attended and described a series of slides illustrative of *A Holiday in Hereford*. He dealt with all the points of interest in the city, and afterwards with the surrounding villages, Whitecross, Weobley, Kilpeck, &c. Reference was also made to the dovecotes for which the county is famous.

Aintree Photographic Society.—November 6.—There was a good attendance of members and friends, who were entertained with an illustrated lecture on the

HIGHLANDS OF SCOTLAND,

by Mr. D. J. Neill, the Secretary. Nine new members were enrolled, bringing the total up to over seventy, and others are expected, especially now that suitable rooms have been provided in the new building. A well-equipped dark room for the exclusive use of members has been built to the plans of Mr. C. H. Adkins, the President.

Leeds Camera Club.—Mr. P. ELLIFF (a member of the Committee) gave a practical demonstration at the meeting on Wednesday week of his method of producing

PHOTO-CERAMICS,

one of the oldest and most charming, yet least-known branches of photography. An impression seems to prevail that the production of photo-ceramics is attended with considerable difficulties and expense; but Mr. Elliff clearly proved the fallacy of this, and showed that not only was the process extremely simple and inexpensive, but that it was one of the most beautiful developments of our already fascinating and multifarious art. Unlike all other printing processes, the results are absolutely permanent and indestructible, not only to the action of light, atmosphere, and acids, &c., but also to the gentle domestic's tender "dusting" and "scrubbing" attentions. Briefly, the process consists of making a print from a positive upon a glass plate coated with certain gummy substances in conjunction with a sensitive salt, developing the image by "dusting on" a finely powdered mineral pigment, transferring the same to the final support, and "firing" or burning-in in a muffle furnace. A good transparent positive of the subject to be reproduced is prepared. A glass plate is next coated with a mixture of equal parts of the following:—No. 1. *Organifier:* Le Page's fish glue, 1 ounce; glucose, 4 ounces; glycerine, 4 drops; water to 10 ounces. No. 2. *Sensitiser:* Ammonium bichromate, 1 ounce; water to 10 ounces. Allow to stand at least four days, and always filter before use. When coated, the plate can be dried over gas or spirit stove or fire. These operations must be conducted in the dark room, or in subdued light. When perfectly dry, the sensitised plate is placed in contact with the glass positive in a printing frame, and exposed to daylight for from one to thirty minutes, according to density of positive and actinicity of light. Only a very faint image is discernible when fully printed; but the same methods for calculating the necessary exposure can be adopted as are employed in carbon printing. As soon as possible after printing, the image is developed by dusting over the somewhat "tacky" surface, by means of a camel-hair mop, the ceramic colour—a finely powdered oxide of iron pigment, containing a little "flux" to give brilliance. When the image is fully developed (which may be assisted in dry weather by breathing upon the surface), coat with enamel collodion let down with equal bulk of

ether, scrape round the margins to make a free edge, and immerse in water. In two or three minutes the collodion film, to which the ceramic colour adheres, will float off the glass. The surface of the object to which the picture is to be transferred is next coated with a flux consisting of a saturated solution of fused borax, made by boiling for ten minutes; when cold, the clear liquid must be decanted from the borax thrown down. The film may now be transferred and dried, by the application of heat, if desired. It is then inserted in the muffle furnace (free from sulphur and dust) and "fired" until the colour is bright. The objects to which this beautiful process may be applied are very numerous, glass and pottery ware being principally employed at the present time; but there is a wide field for expansion, and ere long we may expect to have our homes made beautiful by photo-ceramics in every imaginable form.

Leigh Photographic Society.—November 5, Mr. T. Lee Syms presided.—The subject for the Society's competition, for which Mr. Syms kindly promised an enlargement to the winner, was the Landscape with Figures competition. This subject brought such good work, that the Judges had great difficulty in deciding the winner of the first and second prizes, and it had to be decided by the voting of all the members present, the result being Mr. William Hampson was awarded the first prize, and Mr. W. R. Moore the second prize for a view, *Near Alderley*. Messrs. H. Isherwood, T. Haddock, P. Seddon, and R. Welch showed work worthy of special mention. Mr. T. Lee Syms, by request, gave a criticism on the work, to assist members in improving their work in future competitions. The Secretary distributed samples of Cadett's lightning and lantern plates.

Sheffield Photographic Society.—The newly elected President (Mr. Tomlinson) occupied the chair. The prints sent in to the recent annual competition were on view, and the Judge's awards made known, the silver medal being secured by Mr. Joseph Smith for four well-executed whole-plate platino-bromide prints of the interior of Durham Cathedral, Bishop Ryder's statue (Lichfield Cathedral), Netley Abbey, and Haddon Hall, the print of Durham Cathedral being specially mentioned by the Judge. The bronze medal in the same class falls to Mr. J. H. Lygo for four capital half-plate matt-surface chloride prints of Haddon Hall, that of the ball-room being greatly praised by the Judge. A hearty vote of thanks was passed to the Judge, Mr. R. Keene (Derby), for making the awards, and passing criticisms on the work generally. The lantern was then brought into requisition, and the competition slides thrown on to the screen first. In this class Mr. J. H. Lyo again secured the bronze medal easily with four very fine slides, good alike both in quality and technique. A large number of members' slides were then put through the lantern for criticism, the lantern being ably manipulated and suggestions for improvements made by Mr. J. W. Charlesworth, who was accorded a hearty vote of thanks.

Edinburgh Photographic Society.—November 4, Mr. F. P. Moffat (President) in the chair.—Mr. R. H. Bow, C.E., read a paper on

THE FERROUS-OXALATE DEVELOPER,

in which he held that, as a good all-round developer for plates, this was as good as any. Mr. Bow explained that a fresh developer had a tendency to give flat results, an older one gave more contrast. A few drops of a weak solution of hypo was recommended as a powerful accelerator. After stating that plates developed with ferrous oxalate took a shorter time to fix than after treatment with most other developers, Mr. Bow called attention to a point which he considered new, viz., that any developer which contained much bromide caused plates treated with it to take a longer time to fix than those treated with a developer wanting in bromide. Mr. JAMES PATRICK then read a paper, entitled

STRAY THOUGHTS ON LANTERN-SLIDE MAKING.

Thin negatives, he said, such as were generally made for chloride of silver printing, were no good if the very best quality of slide was wanted. The negative must be vigorous and full of gradation. Good composition was an essential quality in a lantern slide, and in shaping the picture the mask should always be made to suit the subject, and not the subject to the mask. One brand of plates should be chosen and stuck to. Hydroquinone was a very good developer, and a great variety of tones could be produced by it. Mr. FRASER said that, in making slides by reduction (by artificial light), he secured equal illumination of his negative without the aid of a condenser in the following way: At each side of his negative he placed an incandescent gas light, while directly behind his negative he placed a sheet of white paper, the reflected light from which was all that could be desired. A generator for acetylene gas was shown by Messrs. Walla and Fraser, who showed, through the lantern, the light produced by this gas. Several members expressed the opinion that acetylene gas was too dangerous to be used at home.

FORTHCOMING EXHIBITIONS.

1896.

Nov. 17–20 ..... Hackney Photographic Society. W. F. Fenton-Jones, 12, King Edward Road, Hackney.
,, 26, 27 ..... Romford and District Photographic Society. A. John Ormiston, 4, Laurie-square, Romford.
,, 30–Dec. 1, 2 ... North Middlesex Photographic Society.
December 3, 4..... Aintree Photographic Society. E. P. Heron, 2 Tilney-street, Orrell Park, Aintree, Liverpool.
,, 28–31 ..... Borough Polytechnic Photographic Society. P. C. Cornford, 103, Borough-road, S.E.
Dec. 1896–Jan. 1897 Bristol International. Hon. Secretary, 20, Berkeley-square Clifton, Bristol.

1897.

January 14, 15 ..... Weymouth and District Camera Club. E. C. Bennett, 10, Newberry-terrace, Weymouth.

Patent News.

THE following applications for Patents were made between October 28 and Nov. 4 1896:—

PHOTOGRAPHIC APPARATUS.—No. 22,627A. "Improvements in or relating to Apparatus for use in Taking Photographic Pictures." H. J. HEINZE.

DEVELOPING.—No. 23,781. "Improvements in Photographic Developing Apparatus." J. MCINNES SKINNER.

COPYING PROCESS.—No. 23,831. "A Method of Reproducing an Autograph or Design upon Photographic Prints Direct from the Original Copy." W. TYLOR.

HAND CAMERA.—No. 23,840. "A Magazine Hand Camera." HENRY PRADEAU.

SINKS.—No. 23,842. "Improvement in Lavatories and Sinks for Hospital Surgical Photographic and Other Purposes." T. W. TWYFORD.

LANTERNS.—No. 24,112. "An Improvement in Magic Lanterns whereby Dissolving Views can be Shown with a Single Lantern and Instantly Focussed on a Perpendicular Screen." Complete specification. H. L. HASTINGS.

CAMERAS.—No. 24,269. "Improvements in Photographic Cameras." Communicated by F. A. Bownell. THE EASTMAN PHOTOGRAPHIC MATERIALS COMPANY, LIMITED.

PHOTO-MECHANICAL PROCESS.—No. 24,273. "Improved Means or Method of Producing Designs (Photographs or Drawings) by Combining Vitreous Enamel or Equivalent Substance into and with Photo-Mechanical Process Blocks and Electro-types." THOMAS SYMMONS.

CAMERAS.—No. 24,368. "Improvements in Photographic Cameras." W. H. TOMKINSON.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

COLOUR PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—I am sorry to be compelled to make any comments on Mr. Bennetto's statements, *re* "Colour Photography." It is evidently impossible to discuss the relative merits of a secret process, and a fully published process, which produce substantially the same result; but I cannot allow a gross misstatement about my own method to go uncorrected.

There can be no good excuse for the statement that my method has inherent defects which "entirely destroy the truth of the original colours, a disagreeable monochrome running throughout the whole picture," &c., &c. My prints are as sharp as the best carbon prints. The gelatine of each print in its thickest part is considerably thinner than the film on an ordinary gelatino-bromide plate, and practically colourless after the treatment which it receives before immersing in the dye solution. The aniline dyes used for two of the prints are quite permanent in the sealed prints. The third print is coloured by prussian blue, which is usually classed as a permanent colour, and, although not really quite permanent, is probably more so than any other dye of the right colour. In short, I see no reason for thinking that Mr. Bennetto's prints can be better than my own.

All that I know about Mr. Bennetto's work is that he wrote to me some months ago, saying that he had worked out an improved method of making colour prints from three negatives, and that he wished, if possible, to obtain one of my photo-chromoscope cameras for making the three negatives on one plate.

If Mr. Bennetto's triple-colour print is in a single film, the idea is not new, but the working details may be. If the result is accurate in colour, and "as easy to produce as an ordinary silver print," the method will stand on its own merits, and he need not resort to questionable methods of crying his wares.—I am, yours, &c.,

F. E. IVES.

119, *Shaftesbury-avenue, London, W.C., November* 6, 1896.

[We can corroborate all that Mr. Ives says of the sharpness and the purity of colour of the results produced by his method.—EDS.]

ACETYLENE.

To the EDITORS.

GENTLEMEN,—The experience that Mr. Knowles relates is interesting, and I hope that he will let us have further details of the incident. I

have written to him, offering to arrange for the communication of a more complete account of the matter to the Royal Photographic Society, if he is willing so to favour the Society.

My remarks at the meeting he refers to were made for the purpose of taking exception to the comparison of acetylene to dynamite, as being likely to exaggerate in the minds of those present the actual danger in the use of acetylene. I referred only to the apparatus then before the meeting, and said that the danger of the copper compound of acetylene when produced in small quantities, as, for example, in the brass cocks and burners of such fittings as were shown, was not, so far as experience appears to indicate, in the explosion of the copper compound itself, but rather in the possibility (when that exists) of its firing an explosive mixture of gas and air.—I am, yours, &c., CHAPMAN JONES.

November 6, 1896.

THE CARRIAGE OF CALCIUM CARBIDE.

To the EDITORS.

GENTLEMEN,—Perhaps you will give me some information regarding the carriage of calcium carbide by the railway companies.

I had a parcel of 7 lbs. sent me the other day, the charge for which was so excessive that I had to refuse delivery of it. On calling at the railway agent's office, he informed me that the railway companies only carried calcium carbide under the following conditions:—To be packed in an air-tight tin, placed in a strong wooden box or iron drum, and not to be placed in closed van or in the companies' closed sheds, at the owner's risk, charged the highest rates, and the contents declared in a form supplied for the purpose, under a penalty of 20*l.*

The railway company to which I refer, the Great North of Scotland Railway Company, are so excessive in their charges that the traders of this town own two steamers for the purpose of carrying their goods between Leith and Aberdeen, so as to escape the railway charges.

If these restrictions are not enforced on every line, I should still be able to get calcium carbide; but, as it is, I am practically debarred from using it.

I should be obliged if you would let me know how to proceed in the circumstances.—I am, yours, &c., JAS. L. BROWN.

32, *St. Andrew-street, Peterhead, November* 6.

[This is a matter upon which we invite the remarks and experience of our readers.—ED.]

UNFAIR COMPETITION.

To the EDITORS.

GENTLEMEN,—I was very pleased to see and fully endorse the sentiments of Mr. Victor Thomas in a recent issue *re* a beautiful life-size three-quarter length portrait for 6*s.* 6*d.* as advertised by the proprietors of two halfpenny papers.

I think photographers, after this, should boycott these papers by not purchasing them in the future. I, for one, have fully made up my mind not to do so, and I think all other brother photographers should act likewise. W. G. S.

To the EDITORS.

GENTLEMEN,—The letter published on page 719, "*Re* Unfair Competition," may, I think, just as well be headed "*Parler pour ne rien dire.*" Readers of your BRITISH JOURNAL OF PHOTOGRAPHY do not read probably much of these halfpenny papers, and certainly the contrary happens with the very great majority, that is, readers of the newspapers do not read THE BRITISH JOURNAL OF PHOTOGRAPHY, and then what is the use of your fair complainant's letter? We all know that she is perfectly right, but are the *artists*, who are finishing these pictures, not as much to blame, if not more even than the editors of the newspapers? I would even bet that the idea has not originated with the editor, but with the photographer supplying the enlargements. I can very well see the editor in his office, receiving the visit of the photographer, who proposes the scheme, and offers in exchange of advertisements and goodwill, so much royalty on every order (which, by the way, reduces the result to much less than 6*s.* 6*d.*), but I cannot as well imagine the editor running about to find the photographer, or several of them, and the numerous crayon artists necessary for the work, besides the rooms necessary, &c., and the outlay of money. Mind you, I do not defend or praise the editor, but I do not think he is to blame so much, and probably less, than the brother photographer. Let every one have his due. Newspapers carry on to-day a business just as well as any other business, and what else is it than a regular business, this vast amount of advertising, taken at different rates, according to quality (read amount of subscribers) and quantity?

Are you perfectly sure that the diary scheme and photographs for nothing, of which so much was spoken about lately, was not originated somewhat similarly by a brother photographer, friendly to Mr. Editor. Of course, this does much harm to photographers, but I am afraid this controversy, and writing about it, does in the end more harm than good, calling attention to facts which may remain unknown with a great many otherwise. It advertises the scheme more extensively, and stops none of it.

Supposing your fair complainant's father had a splendid run of business, and an advertiser of some goods would ask for permission to hang a frame in his parlour, under the understanding that, on every invoice sold, he would pay him a fair allowance for his permission, I hardly think he would refuse, however it would not be at all in his line of business, yet a frame in his parlour amounts to the same as an advertisement in the newspaper, and he would not think doing any harm to other manufacturers of the same line of goods.

Is it not an English saying, "Business is business?" This has been stretched, some may think, to "Unfair business is business, anyhow," but some others don't. I am, yours, &c., A. LEVY.

4, *Avenue Pinel, Asnières, (Seine), November* 6, 1896.

A TIT-BIT.

To the EDITORS.

GENTLEMEN,—'Tis from the serious *Athenæum*, and the more enjoyable because of its origin. Their critic found out—or he thought he knew!

On page 608, col. 2, of the issue of the 31st ult. of the above-mentioned literary periodical appears a review of the *Cathedrals of England and Wales through a Camera* (Birmingham: J. L. Allday), which, of course, caught a roving photographic eye—focus unknown. In this paragraph occurs the following deliciously unique tit-bit: "Being, generally speaking, on an almost uniform scale, the prints afford something like a notion of the comparative size of each of the churches. The smallness of St. Asaph, for instance, enables the student to form an idea of the vastness of St. Paul's. The simple dignity of Carlisle offers a contrast to the leanness of Truro!"

Criticism here would be more than superfluous; but the joke is too good to enjoy alone, so through your columns I pass it on, and perhaps thus back again to the *Athenæum*. K. B. M.

THE PHOTOGRAPHIC SALON.

To the EDITORS.

GENTLEMEN,—I went to see the Salon on the second day that it was opened, and the impression that was left on my mind was that the charwoman, who had been deputed to stick on the label numbers, after having affixed most of them on the right-hand side, had changed her mind and reaffixed them on the left, but, unfortunately, had forgotten to wash off the paste or gum, and, in one case, had left the remains of a portion of the ticket on the mount.

I did not think the Exhibition worth visiting again, but this morning, as I was passing, I thought I would look in to see if my former impression was confirmed. I found the same gummy marks on the glasses of the frames, the same remains of a ticket. Surely, if it is worth while having the Exhibition, it is worth the while of taking a little trouble to see that the pictures are properly exhibited. Fortunately, it closed on Saturday; but the Exhibition in Pall Mall, which is still open, is much more worth a visit, in my humble opinion, than the Salon.

I enclose my card.—I am, yours, &c., M.

November 5, 1896.

To the EDITORS.

GENTLEMEN,—Mr. Henry W. Bennett goes to a great deal of trouble in his letter to you last week to prove what is at the outset very evident. The Committee of the Photographic Salon being composed of men who are admittedly the leading pictorial photographers of the day, work from their hands must necessarily be the principal feature of an Exhibition of the best examples of the year.

Mr. Bennett says that, out of 339 frames, 189 are contributed by members of the "Ring," and then asks if it is reasonable or fair to invite photographers to send in their best work when it has so little chance of being accepted? Is not the very difficulty of getting work accepted an inducement to outsiders to try? or does Mr. Bennett think it is more satisfactory or more satisfying to send in one's work to an Exhibition where the competition is not so keen, and consequently the chances of being hung are greater? It is, I think, generally held that that is most worth winning which is most difficult to win. Mr. Bennett would have us believe that the reverse is the case, and refers to the Exhibition of the Royal Photographic Society as being more representative than that at the Dudley Gallery. There is certainly more variety, and the Exhibition is distinctly a better one than any the Society has held for some time past; but, as many of the leading pictorial workers are absent, I fail to see how the Exhibition can represent the best work of the year. There is more opportunity at the Royal for the lesser lights in the photographic world to get their works hung, but whether it is better to be

amongst the brightest of the lesser, or the least of the brighter lights, is a question which every photographer must answer for himself.—I am, yours, &c., CHARLES MOSS.

Coombe-road, Croydon, November 7, 1896.

To the EDITORS.

GENTLEMEN,—In your columns of last week I notice another complainant, one signing himself Henry W. Bennett, who protests against the alleged unfairness of the Salon Committee in sending invitations to contribute and then not accepting what is sent in. Now, if these indignant persons would point to any single word or sentence in the Salon prospectus which even implies an "invitation to contribute," it might make things clearer. Beyond the "Conditions of Entry," the list of the Committee, and the Entry Form itself, the only other printed matter on the prospectus is as follows:—

"The Photographic Salon, 1896 (fourth year), will be held at the Dudley Gallery, Egyptian Hall, Piccadilly, London, W., from September 24 to November 7, 1896.

"The aim of the Committee, whose names are given above, is to exhibit only that class of work in pictorial photography in which there is distinct evidence of personal artistic feeling and execution.

"Careful consideration will be given to all pictures entered for exhibition, and a selection of works of pictorial merit made by the Committee. Pictures which have already been publicly exhibited in London will not be accepted. Pictures sent for exhibition to any other Exhibition open in London at the same period are liable also to be disqualified.

"No awards are offered, and no charge made to exhibitors.

"Exhibitors will be entitled to a season ticket.

"Arrangements will be made for the sale of pictures, if desired, and a commission of fifteen per cent. will be charged on sales effected."

If, therefore, Mr. Bennett, or any one else, says an "invitation to contribute" was sent, that statement is untrue.

Mr. Bennett also states: "Merit alone does not secure admission to this Exhibition, and that the absence of merit does not of necessity involve rejection, as a glance at the walls each year will show."

This, as an expression of personal opinion, no one need begrudge the writer, but, expressed thus publicly, it should be remembered that it charges the Committee with one of two things—either they are guilty of scandalous breach of faith amounting to rascality, or else they are incompetent to judge or select.

In the first case, Mr. Bennett should remember that a great proportion of those forming the Salon Committee are also respected members of that Society which, by calling himself "ardent Royalist," I presume he wishes to support; they are also men of position and good repute. Does Mr. Bennett understand what this means?

Secondly, the Committee is composed largely of those photographers whom the public, the general Press, the photographic Press, and photographers generally have awarded positions in the very first rank—men who are asked to judge, to lecture, to write, to exhibit, all over the world—thus showing the confidence usually reposed in them. They select the best from the whole of the works sent in, and these are hung according as space permits. Mr. Bennett does not agree with the judgment of these gentlemen, which, after all, is not in the least surprising, nor of much importance.

Like many others, Mr. Bennett appears to regard the Salon Committee and The Linked Ring as synonymous, for which he has no authority whatever, and further he would seem to affect some knowledge as to "articles of faith" among the "Links," all of which is pure fabrication and a not very reputable performance either.

Your discontented correspondent complains that forty-three "members" have contributed 189 works, which I should have thought was not a very large average for well-known workers, and one might fairly well assume that in whatsoever "selected" Exhibition those forty-three "members" showed they would hardly have had less accepted; as one who had five frames rejected, I have the impertinence to think they might have accepted more!

The Pall Mall and the Salon are both equally "open" Exhibitions, but perhaps, as things are at present, the chance of being accepted and hung at the former is greater, because of the fact that quite a number of exhibitors do not send at all, while at the Salon there is nothing like the same abstention.

Suppose, for instance, there had been no Salon this year, and those same forty-three exhibitors had sent twelve pictures each to Pall Mall, my own impression is that more than 189 works from them would have been accepted—not perhaps the identical works which the Salon would have taken, because probably the respective Committees judge from a different standpoint.

It would be a happy thing, Sir, if you and those of us who have the control of contemporary columns could agree together to suppress all letters from private persons attacking either the Pall Mall Exhibition or the Salon; they seem to invariably emanate from persons whom some imaginary grievance has rendered spiteful, and their sentiments are not, I believe, re-echoed by responsible persons of either Exhibition; and in conclusion I would like to say that, whilst Mr. Bennett has done me the honour to refer to me as a member of the Salon Committee and as Editor of the *Amateur Photographer*, I write this only as a private individual, and without any wish to involve others who may or may not agree with me.—I am, yours, &c., A. HORSLEY HINTON.

November 9, 1896.

To the EDITORS.

GENTLEMEN,—I do not think the subject of Mr. Evans's letter in your issue of the 6th inst. is of sufficient public interest to warrant a detailed explanation of the circumstances of the case.

I must, however, correct two statements of fact.

It is not the fact that the pictures referred to were sent to Mr. Evans's address by me or by my instructions, and I am sure he holds no receipt from us of the sum of 2*s.* paid by his housekeeper.

It is not the fact that Mr. Evans has been invited to show at the Salon from the very first, as he says he has, or that he has ever been invited to exhibit at all.

My connexion with the Salon brings me a large correspondence, and into relation with a considerable number of persons. Doubtless, Mr. Evans's correspondence is also very large. I hope I may be permitted to flatter myself that those who best know us both will be easily able to form a correct judgment upon the probable merits of the case.

That Mr. Evans has transferred the favour of his correspondence from myself to you, Sir, is a matter of which I should be the last to complain; but I must beg to be excused from any further replies.—I am, yours, &c., ALFRED MASKELL.

63, *St. James's-street, Pall Mall, S.W., November* 10, 1896.

THE AINTREE EXHIBITION.

To the EDITORS.

GENTLEMEN,—Will you kindly remind readers in the next issue of the *Journal* that all entry forms from intending competitors in the five open classes should be received by me not later than November 21, and oblige, yours faithfully, E. P. HERON.

2, *Tilney-street, Aintree, near Liverpool, November* 7, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Robert William Howes, East Dereham.—*Two photographs of Clare Sewell Read, Esq.*

Weber & Coggins, Cleveland Studio, London-road, Bracknell, Berkshire.—*Photograph of their Royal Highnesses the Duke and Duchess of Teck.*

PRINCESS PEACE.—See under Ex Cathedrâ.

TONES.—TONINO. Please say definitely the paper you mean, and not by letters, as more than one paper is known under those initials. We shall then be able to help you.

GELATINE PAPERS.—A. C. ROSEN. Gelatino-chloride papers will not stand the same treatment as regards washing in hot water as albumen. Hot water must not be used with these papers. The "hypo salts" can be washed out with cold water, without the use of hot.

HAND-CAMERA LENS.—C. COX. What is generally known as a "wide-angle lens" is not suitable for a hand camera at this time of year. Lenses of that class have a small angular aperture, and are therefore slow in action. The largest aperture of this type of lens is usually about *f*-16.

W. J. BARKER.—Sorry we can give you no further information than that contained in the paragraph you quote. Were we ourselves trying the method, we should apply the ammonium tartrate after the acid bath. We do not think any chemical danger would arise; but as to whether all traces of the iron salt would be removed we can hazard no opinion.

LANTERN SLIDES.—CHARING CROSS. The slide sent in is far too dense even for the Camera Club lantern. Why not make two or three slides from the same negative, of varying density, and try them at the Club one evening before printing the lot? If the slides are too dense for the electric light, they will be much too dense for any other light.

CRACKED ALBUMEN PRINTS.—W. ASTON. Much of the very highly glazed albumen paper is prone to crack if allowed to curl up as it dries, when it is unrolled. This may be prevented in two ways. First by mounting the prints while they are wet; second, by drying them between blotting-paper, so that they are kept flat the while.

LENS FOR GROUPS.—T. BURROWS. The orthographic lens is an excellent lens for some purposes. You will find it admirably suited for groups out of doors or in the studio. For such purposes, for large sizes, it is preferable to the portrait combination, and, being longer in focus, will answer your purpose best of the two.

CHARGES FOR PHOTO-MICROGRAPHIC WORK.—There are no fixed charges for this class of work any more than for any other; but, being of a highly technical nature, it is always charged pretty high. For the work specified, if it be skilfully done, we should suggest from five to ten guineas; mediocre work proportionately less.

SOUTH AMERICA.—PRINTER. We are not aware what are the salaries paid to assistants in the Argentine; but, judging from the work we have seen from there, we should not advise any one to go out with the idea of obtaining an engagement unless he is up to the highest possible work.

LIGHTING.—BEGINNER. The portraits Nos. 1 and 2 are better than the others, but they want more shadows. There is too much top and front light. In lighting the subjects there are no definite rules for arranging the blinds. That must depend upon the type of subject to be illuminated and the light at the time. A bright cloud here or there will often necessitate a rearrangement of the blinds.

DISCOUNTS.—H. B. If one house allows you a discount off their list prices, it is no reason why other houses should do the same. As an amateur, we see no reason why you should expect a discount at all. We hope you have not represented yourself as a professional to the house from which you succeed in obtaining a discount. That would not be honourable.

AGREEMENT FOR SERVICES.—OPERATOR. If there is a duly executed agreement for your services to the end of March next, you cannot be discharged now under the plea that there is not work enough for you during the winter months. An agreement is an agreement, and it is binding on both parties to it. You can certainly claim your salary, and get it, up to the end of the term. The County Court will settle that.

PHOTOGRAVURE.—D. DENMAN. If the negative image, when developed on the copper plate, shows blisters, it will be of no use to etch it, as the blisters will show on the copper when the image is bitten in. The blisters are due to faults in the manipulations, but in what way it is impossible to indicate, as there are many causes from which they may arise. With fuller details we might aid you.

ACETYLENE.—W. BORER. Acetylene, under the best conditions we have seen it used, will not compare with the oxycalcium light in the lantern, nor is it claimed for it that it will. With regard to its safety in inexperienced hands, we can add nothing more than has already appeared in the JOURNAL. In experienced hands—those who understand its properties, &c.—it is doubtless as safe as any other light.

INSOLUBLE GELATINE.—T. DILLON writes: "I have tried to make gelatine insoluble by the addition of chrome alum, but cannot. If I add a large quantity of the alum to a solution of gelatine, it coagulates into a stringy mass. If I add less, it gives a film which, when dry, absorbs water, though it does not dissolve in hot water."—Although chrome alum renders gelatine insoluble, it does not prevent its absorbing it with long soaking.

REPAIRS.—B. J. A. As the lease you hold stipulates that the tenant is to keep the premises in thorough repair, and the lease was transferred to you by the landlord from the one from whom you purchased the business, you are, of course, liable for all dilapidations, notwithstanding that the place was out of repair when you took it over from the previous tenant. Had the landlord not accepted you as a tenant, he would have had to look to the one to whom he granted the lease for the repairs.

COPYING A PICTURE.—A. H. CADE says: "I am asked to copy two of the original-proof engravings of Doré — *Christ Leaving the Prætorium*. May I ask if you know whether the copyright has expired, or shall I be rendering myself liable to damages if I make a copy?"—In reply: We are under the impression that the copyright of the picture referred to has not run out. Our correspondent had, therefore, better ascertain for himself before running any risks, which he certainly would do in copying the picture.

PHARMACEUTICAL PERSECUTIONS.—DEALER. On the whole, you were wise to pay the penalty and the solicitor's charges, so far as your pocket was concerned, for it would probably have cost you more had the case gone into court. Possibly not, however, as the County Court Judges are getting to be very much against the Society's vexatious proceedings. You have our sympathy, as you evidently sinned unwittingly. No good would result from the insertion of your letter, particularly as some time has elapsed since you settled with the Society.

PHOTOGRAPHIC SOCIETIES.—F. E. F. says: "You would greatly oblige me if you let me know the addresses of a few London photographic clubs or societies which take amateurs as members, also kindly let me know what the subscriptions would be to become a member—a beginner who wishes to perfect himself."—In reply: Better consult the list of societies in our ALMANAC. The subscriptions range from 5*s.* to 5*l.* 5*s.* per annum. If you care to call upon us any morning between ten and one, we would advise you in the matter.

LENS.—W. W. WILLIAMS: "I am writing to ask you kind advice in choosing a lens for a quarter-plate stand camera, capable of doing all-round work, such as landscapes, near and distant objects, interiors, architecture, &c. I am going abroad for some months, and must needs make my luggage as portable as possible. Would the new anastigmats answer the purpose, or would it be necessary to carry several lenses?"—In reply: The Convertible Anastigmat is probably the lens which more nearly fulfils our correspondent's requirements.

REPAIRING CAMERA BELLOWS.—T. COLEBROOK. If the bellows of the enlarging camera is of mackintosh cloth, there is nothing better than a similar material for repairing it. Get some black indiarubber sheeting, and then smear over such strips as will cover the defective parts with rubber solution as well as the parts to be covered. Allow to dry, then apply the strips as plasters, and rub well in contact. The rubber solution can be obtained where the sheeting is purchased, and the finger is a good medium for distributing the solution.

EXHIBITING WORK OF EMPLOYÉS.—BOURNE writes: "I thank you for your reply to my inquiry in last week's JOURNAL. I still venture to ask you one more on the same subject. I am sending a frame with six cabinet portraits to an exhibition for competition. My operator took the negatives and printed them in platinum. Can I enter them in my name, or must it be in that of my operator?"—Photographers do occasionally exhibit pictures in competition in which they have had no hand in the production; but how far this is legitimate is much a matter of individual opinion. It is very doubtful, if the jury is made aware of the fact that the whole of the work is that of an *employé*, that they will award you a prize at all.

BACKGROUND.—W. RICHARDS says: "I have several times tried to repaint my background in distemper, but have signally failed every time, as I cannot avoid the brush marks. I mix the distemper in the usual way with whiting, lamp-black, and double size and water. I think my trouble arises from my not being able to get all over the background before the stuff gets cold and like a jelly."—Our correspondent's trouble is due to his using the distemper warm. It should be made the day before use and allowed to become a jelly; then it should be applied in that state, the jelly being broken up and evenly distributed with the brush. If the background has been distempered before, it should be sized before the distemper is applied.

KINEMATOGRAPHY; HALF-TONE WORK.—A PROFESSIONAL says: "1. Is the Kinematograph and slides for moving effects to be had, and where, and what would the probable cost be? 2. I am anxious to have some lessons in process work, line and half-tone, and am well up in photography (wet plate); is there any one who would give lessons in it—one who is first class?"—In reply: 1. Address Messrs. Watson & Sons, High Holborn; Mr. Birt Acres, Barnet, N.; Mr. Paul, 44, Hatton-garden; The Kinetograph Company, 62, Romola-road, Herne Hill. The cost ranges between 30*l.* and 100*l.*, but this is only a rough guess. 2. We know of nobody in your town; but such lessons are to be had at the Polytechnic Institution, 309, Regent-street, W.

LENS; PRINTSELLERS' ASSOCIATION.—E. F. C. asks: "1. Can you, in your Answers column, give me the benefit of your advice on the focal length of lens desirable for copying purposes? Taking a plate 18×16 as maximum, is nineteen to twenty inches too short a focus to use with an anastigmat such as the Goerz? In reproducing oil paintings, would not reflections cause trouble, the lens being somewhat near the picture? I am told that this focal length is sufficient with the size of plate mentioned when such a lens as the Goerz is used. 2. Can you inform me if the Printsellers' Association concerns itself with photographic prints (as distinguished from photogravures)? and could you give me any information as to its purpose and membership, if any, or direct me to a source whence I could obtain particulars?"—In reply: 1. A lens of the type and focus named will, when used with a stop, cover the size of plate mentioned; but, in practice, it will be preferable to have one of somewhat longer focus, so that the camera has not to be brought so near to the subject to be reproduced. 2. The Printsellers' Association have nothing to do with photographs pure and simple. The Secretary of the Association will give you all particulars as to the objects of the Association. Sorry we do not happen to know the address.

*** *We have in type several articles, answers to correspondents, &c., which pressure on our space obliges us to hold over.*

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EX CATHEDRÂ.

The President of the Society of Patent Agents devoted his annual address last week to the subject of the value of Patent property. The address was full of interesting facts and statistics regarding the successful working of the patent laws as amended by Mr. Chamberlain thirteen years ago, and other subjects cognate to the author's main theme. A suggestion has recently been made that Patent litigation should be conducted in a Patent Court, presided over by a High-court Judge, but Mr. Fairfax discounts that suggestion by pointing out that the Judge in most, if not all, technical disputes would be entirely at the mercy of the highly trained counsel engaged, so that injustice would be difficult to avoid. He does not, either, appear to favour the suggestion that professional witnesses—composed of men of high theoretical training, of great intellectual ability and experience in the Courts—should be relied on by either side or both, inasmuch as they must, sooner or later, become advocates, and therefore expert witnesses in a double sense.

* * *

Mr. Fairfax, however, advocates the extension of the power of the Court "we now have at the Patent Office, under the Comptroller-General, so as to apply to cases of infringement and revocation, in addition to the opposition cases which it now hears. All the expert evidence could then be given in the form of statutory declarations, and the points of law and evidence, after submission to each party under the direction of the Patent Office, referred to the Judge for his decision. This would bring the evidence of opposing experts directly in conflict instead of through the intervention of Counsel, thus bringing out all the points; the procedure would be very much hastened and the cost of an action greatly reduced as compared with the present system."

* * *

The suggestion made by Mr. Fairfax is an eminently common-sense and practical one, and, if adopted, would partly, at any rate, put an end to the very hap-hazard system under which patent actions are at present fought; but, in reading through Mr. Fairfax's address, we were sorry, although, of course, we were neither surprised nor disappointed, not to see a portion of it devoted to the inequitable method at present adopted by the Patent Office for granting Letters Patent. As we and others have repeatedly pointed out, it virtually amounts to taking a patentee's money under false pretences, for no protection whatever is guaranteed him. In the course of a year, very many Patent specifications pass through our hands, by far the greater number of which should not, and would not, have been granted under some such methods as those adopted in the United States and Germany, where, we believe, the Patent Offices have an examining or searching system which prevents repatenting or the utilisation of old ideas. In both these respects the English Patent Office is almost entirely impotent; and the consequence is, especially as very many patentees do not employ agents, that the number of patents annually granted conveys an altogether erroneous idea of the sum of the really original inventive ability which the cheapening of patents is supposed to have called into existence.

* * *

A transformation has been effected at the Dudley Gallery, Piccadilly, within the last few days. The Exhibition of Modern Pictures, held by the New English Art Club, has taken the place of the pictorial photographs got together by the Photographic Salon. The familiar little room is now ablaze with colour. There are about ninety pictures hung, among the exhibitors being Legros, Pennell, Wilson Steer, F. Bate, Buxton

Knight, D. S. MacColl, W. Rothenstein, the Sickerts, Moffat Lindner, Fred Brown, &c. A criticism of the Exhibition would be slightly out of place in a photographic journal. We feel called upon, however, to make one remark, viz., that, having attended many Exhibitions of the Club, we discern year by year fewer evidences that its members deliberately produce work for the purpose of defeating comprehension. It is worth noting that a like remark holds good with regard to the Photographic Salon.

* * *

We have received the syllabus of the Bolt Court Guild and Technical School, 6, Bolt-court, Fleet-street, E.C. The school is under the joint control of the Technical Education Board of the London County Council and the National Society of Litho Artists. In the technical department of the school evening classes are held in collotype, half-tone, and line etching; photo-lithography, three-colour work, and other subjects. The teaching staff includes Mr. C. W. Gamble, Mr. E. J. Wall, and other qualified gentlemen. The fees, both for non-members and members, are exceedingly moderate, while non-members who are in receipt of less than 30s. per week are admitted to any or all of the classes on payment of 1s. per month. This opportunity of cheaply acquiring a practical knowledge of some branch of process work is one that should commend itself to and be taken advantage of by many young photographers. The Secretary, Mr. Donagan, at the address given, will forward to those who send for it a pamphlet giving detailed particulars of the various classes.

* * *

The winter session of the London and Provincial Photographic Association has started unusually well. The meetings of late have been very numerously attended, and a reference to the reports and papers emanating from the Association which we have recently printed will show that the discussions that have taken place have been of extreme practical and scientific interest. We are asked to state that efforts are being made to draw up an attractive programme of subjects for next year. Furthermore, the officers desire it to be known that visitors are always welcome to the meetings, which are held on Thursday evenings at eight o'clock at the White Swan Hotel, Tudor-street, Blackfriars, E.C.

A SUGGESTION FOR A TECHNICAL EXHIBITION.

These remarks are designed to supplement our article of a fortnight ago, in which we expressed the ideas of many photographers that at its Exhibition just closed the Royal Photographic Society permitted the purely artistic side of photography to predominate, almost to the exclusion of the technical or scientific branches. In a paper read before one of the societies three months ago the present writer threw out the suggestion that an Exhibition devoted entirely to photographic technique would probably be welcomed, and since that time a like suggestion has emanated from other quarters. Evidently, a strong feeling in its favour exists, and we therefore hope that the attention of the Royal Photographic Society will be directed to the matter.

It will not, of course, be gainsaid that the Society is the most suitable body to consider the suggestion and to endeavour to carry it into effect. That its annual Exhibitions have always paid some regard to technical and scientific photography is unquestionably the case, but it will probably be admitted that this has only been done to an inadequate extent. The consequence has been that the pictorial or artistic features of those Exhibitions, appealing, as they have done, to popular and general tastes, have overshadowed the technical and scientific, the result being that the latter have admittedly dwindled down to insignificance. This seems to indicate that the two sides of photography are not called for in the autumn Exhibition of the Society; that it is undesirable to unite the two sections in one display, and that a distinct Exhibition, held at a different time of the year, and devoted exclusively to photographic technique and science, is required.

We do not count ourselves among those persons who, while recognising photography as a progressive science, are yet unable to discern that it is constantly producing fresh developments and improvements. Consider what the last five years have brought forth! Interference photography; radiography; acetylene; animated photography; new lenses having properties of which our optical friends of the last generation did not dream; highly sensitive plates; improved or modified printing processes; and new developing reagents. In three-colour work and in the various photo-mechanical processes persistent improvements and experiments are being made; orthochromatism is absorbing undiminished attention; while scarcely a day passes but what reveals some new application of photography to industrial, commercial, or scientific purposes! Surely, aside of the fact that even the technique of every-day photography requires opportunities for demonstrating its advances, here is scope enough for some such Exhibition, the holding of which we are advocating.

"Pictorial" or "artistic" photography has no firmer friends than ourselves, but we are inclined to think that this branch of photography stands at present less in need of encouragement and advocacy than the more prosaic technical and scientific branches. It is upon the latter that photography as an industry and as a profession chiefly depends. Our processes want perfecting; there are still many problems awaiting solution at the hands of the chemist and the physicist; above all, there is a widespread demand for a dissemination of technical photographic knowledge, towards which a properly organized and regularly held technical Exhibition is capable of rendering great assistance. By a frank recognition of this fact the Royal Photographic Society will earn the approval of photographers all over the country.

It appears to us that the spring of the year and in London would be the best time and place for holding such an exhibition as is here suggested. We are not blind to the fact that the financial side is not the least of the difficulties the Society would have to face in dealing with the matter, but the support which it would be entitled to receive from the trade, the manufacturers, and others interested in the technical progress of photography should be sufficient to guarantee it against loss. A feature might well be made of foreign exhibits, so that by this and similar means an Exhibition entirely typical of the technical position of photography could be organized.

But, as it is scarcely within our province to enter into matters of detail which could better be settled by the Society itself, we here take leave of the suggestion in the sincere hope that it may in some form or other secure adoption.

Royal Society Medals.—The Queen has graciously approved of the bestowal of Royal Society Rumford medals to X-ray workers—to Professor Philipp Lenard, and also to Professor Wilhelm Conrad Röntgen, for their investigation of the phenomena

produced outside a highly exhausted vacuum tube, through which electric discharge is taking place.

Vesuvius.—The eruption of Vesuvius continues, and the stream of lava is still flowing down the side of the mountain to the danger of the observatory. According to a *Daily News* correspondent it is now proposed to erect a second and smaller observatory at the foot of the central cone, as there slight shocks are distinctly felt, but which pass unnoticed at the large observatory. An observatory on any mountain cannot be a very pleasant dwelling, but what shall be said of one on a volcano, which is always in a more or less active state?

Motor-car Day.—The weather in London on Saturday last brought disappointment to many who had made up their minds to perpetuate by photography the epoch of a new departure in locomotion. The weather was "November" in every sense of the word. A thick, damp fog of the real November type enveloped the neighbourhood all the morning, rendering successful photography quite out of the question. Good photographs of the event would have been interesting, as well as valuable, a few decades hence, as showing the early state of the motor car in England. These photographs would then be as interesting as would photographs now of the first railway train in this country. By the bye, what a contrast such pictures, if there were any, would be to the snap-shots of our present 'Flying Scotsman,' 'Flying Dutchman,' &c., taken going at full speed.

Rapid Printing.—Mr. Friese Green's rapid-printing machine, which was exhibited at the Royal Society's Conversazione in May last, has been adopted by Herr Arthur Schwartz, at Berlin, who uses it for the printing of illustrations for magazines. The bromide paper generally used is 100 centimetres (about 4 inches) wide and a kilometre long. When several negatives can be printed from at once, a wider paper, 450 centimetres (about half a yard), is used, and under these conditions some forty thousand cabinet pictures have been printed in ten hours' time. The Russian *Photographic Review* recently gave a description of the process, illustrated by twelve hundred prints obtained by their machine, every print being stated to be exactly alike as regards colour and detail.

Turning the Tables.—The police of England, and most other countries, have a goodly collection of photographs of evil-doers, by which they can at any time be recognised. Now it is reported from Copenhagen that the police there have arrested an anarchist at whose house they found a very complete collection of photographs of the principal members of the secret police of Denmark, as well as those of other countries. It is said that the photographs, mostly, had some remarks upon them, such as "very dangerous," "used for secret missions," &c. The portraits were evidently intended for anarchists' clubs, to show the members the men to be avoided. This, if correct, would indicate quite a new departure in the use of photography for identification purposes. If the police have photographs of evil-doers, why not the latter portraits of the "tecs," if they can obtain them?

Acetylene Lamps.—Notwithstanding the accidents which with acetylene, as with most new discoveries in illuminating agents, have occurred, and the difficulties raised by railway companies, about which we may have further to say when our inquiries are completed, the industrial uses of this agent are spreading and are being catered for by the manufacturers. M. Trouvé, whose name is so familiar with regard to electric-light appliances, has designed a lamp which is described in a recent number of the *Comptes Rendus*, for burning acetylene under certain conditions which he deems essential. He attaches great importance to the gas being both cool and dry before being burnt, and to this end employs two gas-holders, the gas in one being cooled and dried while the other is being filled.

An Innovation.—The Committee of the Photographic Club have decided to have what is termed a trade night occasionally, when inventors and dealers will be invited to bring forward any novelties they may have. These evenings should be very interesting, and will, no doubt, secure good attendances as well as giving those who have novelties to bring forward the opportunity of doing so. The trade nights will be the first Wednesdays in January, March, and May next year. By the way, at the annual meeting of the Club it was proposed to have a vacation during the summer months—one of the features of the Club is that it meets weekly all the year round—but it was decided that the meetings should be he held as usual: for a short period, they should be quite informal. Informal meetings are generally very interesting to those who attend, and often much information is gained. The holding of informal meetings is a subject that may profitably commend itself to other photographic societies.

The November Meteors.—The following suggestion by *Nature*, though too late for use for the principal showers of this month, may, with advantage, be placed on record for the guidance of future photographic observers. The great value of observations of these meteors is to ascertain as exactly as possible their radiant points, as the journal named states: "One can quite understand that, by placing a small camera on a telescope equatorially mounted, and employing a wide-angle lens oriented towards the radiant point, a large space in the sky can be included on the plate sufficient to catch many of the streaks if they are at all numerous. . . . The use of a wide-angle lens necessitates that, if an equatorial be used, the camera must be placed at the extreme end (object-glass end) of the telescope, otherwise the opening in the shutters will cut off some of the field, and in consequence neutralise to some extent the value of the wide-angle. . . . *The Observatory* contains an interesting article by Dr. Johnstone Stoney on the Leonids, in which he quotes an extract from a letter received from General Tennant, who advises practically the same method advised above."

Ceramic Photography.—Although ceramic photography must be numbered amongst the earliest of photographic processes, it has never taken any great hold on the British public. In times past it has been once or twice somewhat vigorously exploited, but it did not meet with commercial success. During the last year or two it has again been brought forward with some prominence, but few professional photographers appear to have taken it up, in some instances, no doubt, through the mistaken idea that the process is difficult to work, and that costly appliances are necessary. This is a fallacy, as will be seen on reading the report of a demonstration of the process at the last meeting of the Leeds Camera Club, and those of previous demonstrations before other societies. Although photographers do not avail themselves of the ceramic process, others are doing so, and in a direction scarcely anticipated by many, namely, for advertising purposes. At one of the London railway termini are some photographs, burnt in on the ordinary enamelled iron, as used for advertisements of houses and properties for disposal. The pictures are good, though the colour is not quite all that might be desired, and the size is by no means insignificant, about twelve inches by ten. There is little fear that these pictures will share the fate of the silver prints used for similar purposes that may be seen at most railway stations.

Storing Apparatus for the Winter.—The period of the year has now arrived when the larger proportion of amateur photographers have abandoned the idea of further photography, at least out of doors, till the spring. It is somewhat surprising the little heed many amateurs pay to the storage of their apparatus during the winter months. More often than not it is put away, in some out-of-the-way place, just as it was last used, without any thought as to the state it will be found in when next required for use. "Safe bind, safe find," is an old adage, and it should be kept in mind when storing photographic apparatus for the winter season. A damp place for storage should always be avoided, as, in it, the wooden portions

would be liable to swell and the glue soften and ooze from the joints, while the leather bellows will probably become mildewed. If the apparatus is made of ill-seasoned wood, an abnormally dry place will often prove injurious by shrinking the wood and causing it to crack. The best conditions are a place of tolerably equable temperature, neither too hot nor too cold, not damp or abnormally dry.

Before the apparatus is put away, it should be thoroughly dusted and cleaned, and a little pure olive oil may then be put on the metal hinges. In the case of metal instantaneous shutters, if they have been oiled in the working parts, the old oil should be cleaned away and fresh applied. If there is any tendency in the folds of the bellows to stick together—and there is that tendency with most when tightly pressed together for a long time—the gussets should be well rubbed over with French chalk. This all done, the next thing is to protect the apparatus from dust during its long storage. Even if it be contained in a leather or canvas case, it is a good plan to enclose that in brown paper; then, when next required for use, when the paper is removed, everything is ready. With regard to the lenses, they should be dusted, wrapped in paper to protect them from the atmosphere, and stored in a perfectly dry place. Exposure to the atmosphere and moisture have a tendency to impair the polish on the surface of lenses, particularly if they are of some of the new glasses.

Röntgen-ray Notes.—*Nature* "has much pleasure in noting that a 'Yorkshire lad,' Mr. G. W. Watson, of Keighley, has obtained some wonderfully good Röntgen photographs by using an old home-made Wimshurst machine to illuminate a Crookes' tube. The machine gave a spark about one and three-quarter inches in length, and was without condensers. With this primitive instrument good radiographs of the bones of the hand were obtained in about twenty minutes. One of these pictures, and also a radiograph of an abnormally developed elbow, have been submitted to us, and both are very creditable productions. The definition is unusually clear, and the hollow structure of the bones is distinctly visible. Mr. Watson's success may induce others to see what they can do with simple means."

Theory of the Production of Röntgen Rays.—M. P. D. Heen, in the Bulletin of the Royal Belgian Academy, propounds a new theory as to the genesis of the rays, which are generally considered as being brought about when the cathode rays strike a solid object. M. Heen supposes them to be caused by the molecules projected from the anode and cathode encountering each other. He had a tube constructed with the anode composed of two thin sheets of aluminium placed parallel. When the current passed from either of these plates to the cathode, the X rays were produced; but when the connexions were changed, and the two sheets were made respectively anode and cathode, no X rays were to be discovered. The explanation given was that in the small space between the two plates there would be only such a limited number of molecules that no effect of X-rays character would be produced.

A New Use for the Rays.—The chief of the Medical School of Paris has utilised the Röntgen rays to obtain photographs of the network of blood vessels in an injected subject. Taking advantage of the opacity of certain mineral substances to the rays, he injects the tissues with an alcoholic solution of sealing-wax, to which has been added a quantity of bronze powder as ordinarily found in commerce. Upon exposing a subject so prepared to the Crookes' tube a perfect network of the vessels is shown. M. Marey exhibited three of the results so obtained; they were of excellent quality, and he stated that they were better than any hitherto obtained under more ordinary processes.

Röngten Rays.—Application to Paleontology. Dr. Lemoine, well known for his Paleontographical work, his discoveries regarding the oldest mammals known to science, those in the lower Eocene strata, has just described to the Paris Academy of Sciences a new use for the Röntgen Rays in connexion with his special investigations. Dr. Rémy, with the assistance of M. Contremoulins, presented in Dr. Lemoine's name a series of prints of a most admirable kind, alike for their sharpness and the detail shown of the various superposed planes of the objects represented, and the ease with which an examination could be made of all the interior details, bone structure, organs of nutrition, crowns and roots of teeth. It was stated that for the future it will be possible to study, without making sections, the formation of the skull and the cerebral markings, and without removing the surface, both sets of teeth as they lie close together. At once could be seen all the characteristic points of various bony parts, birds with spongy, reptiles with compact, tissue; fishes' vertebræ, and so on. Even the egg shells hidden in their covering of stone showed out marvellously. Altogether the results appeared a great success.

The Rays by the Aid of a Wimshurst Machine.—A very long, valuable, and most interesting letter appears in last week's *Nature* over the signature of T. C. Porter, Eton College, on this topic. It is difficult to give it in abstract, and those interested we would direct to the original.* We may, however, say that Mr. Porter finds he obtains, with even a comparatively old-fashioned Wimshurst machine, and a four-and-a-half-inch spark coil, a brilliancy of effect which was surprising, and a steadiness of image most grateful to the eye, with a tendency, however, to reverse after a rest, and to an alteration after a lapse of time for the character of the discharge to alter. Light patches and streaks appear on the tube, which diminish the powers of the X rays, and, after the spots enlarge and coalesce, possibly destroy them altogether. Blowing on the patches has a tendency to cause them to move to a position less injurious to the rays. Mr. Porter is now enabled to produce three different classes of rays, which he terms X_1, X_2, and X_3 rays, each having entirely different properties from the others. His X_3 rays are most brilliant, strong enough to show on the screen so as to be seen (if ordinary shadow pictures) by a whole roomful at once; while the back-bone and ribs of a man may be seen by three or four at a time. The X_2 rays, when the hand is placed before the screen, show a very dark shadow from flesh, and the bones scarcely visible. Arranging his apparatus again differently, he got the X_1 rays, which gave most bright and exquisitely clear images on the screen. The full details of how these effects were brought about will be seen in the letter we quote from.

BY THE WAY.

After all, it seems that the Pall Mall awards were generally accepted without much complaint, in spite of the somewhat hazardous experiment, as it appears to have been regarded, of trying painter Judges. Why it should have been looked upon in the light of an experiment I am at a loss to decide, for surely, in years past, there have been artists or painters on the Pall Mall jury, notably Mr. Stacey Marks and Mr. Henry Moore. True, there have been complaints, both loud and deep, in former years, in all sorts of directions, with regard to the awards, but I never heard that the "artist" element was blamed for them. Rather, I fancy, the growls were directed against what was regarded by a certain class of members and non-members as a piece of favouritism which gave the medals, year after year, or turn and turn about, to a few old exhibitors, whose names had become historical in connexion with the parent society's exhibitions. There was also, no doubt, a spice of discontent amongst another section of more or less disappointed exhibitors, who eventually wisely took themselves off, and started "a show of their own," which appears to give them, now, unlimited satisfaction, for they get "hung" without the danger of having to take second place to any one else.

The *pros* and *cons* of the system of appointing painter Judges at photographic exhibitions have been talked and written about to such an extent that it seems impossible to put forward any fresh arguments on either side. My own opinion is that, if a medal is

* Vol. lv., No. 1411, pp. 31 *et seq.*

offered for a fine photograph, the best Judge is a technical photographer; if for an artistic picture, a trained artist is the better judge: while, for a picture combining technical excellence with pictorial merit, I think no Judge can be selected who will better fulfil the part than one who has himself "gone through the mill,' who has, in fact, been himself a successful producer of artistic photographic work.

I have had some little experience myself in judging, side by side with recognised "artists," or, in other words, painters of more or less renown, and, from the photographic point of view, I do not hesitate to say that there are no half measures with them—they are either mere dummies at the job or else autocratic nuisances. I was on one occasion one of a jury of five—four photographers and one painter—and in one of the classes we had a most difficult task. I forget whether the subject was portraiture, or *genre*, or what it was; but we had placed side by side the highly finished studio work of two of the leading "art" professionals of the day. These in style and everything else differed from one another sufficiently to constitute entirely distinct classes; but, when mixed up with them we had also a lot of nearly life-size studies of heads by a well-known amateur, whose distinguishing characteristic was the grim truth to nature he put into his work, the difficulty of comparison may be imagined—it was about tantamount to attempting to compare a cauliflower with an orchid at a flower show.

When the pictures constituting the "class" were brought out for comparison, I think we looked at one another and smiled. The artist was the first to show a gleam of sense, for he expressed his intention of "standing out" of the decision, as he did not, he thought, sufficiently understand the technicalities of photography; and the rest of us cut the Gordian knot by declining to make an award at all. It was, perhaps, a mean sort of way of getting out of the difficulty; but I think we were justified, especially when the artist, a portrait painter, by the way, declared afterwards that, if left to himself, he should have unhesitatingly given the award to the large heads, because they showed "more realism than he thought photography could render." Certainly, they were wonderful examples of what a photographer with good eyesight and assisted by the best of optical means can do in the way of rendering, or, rather, exaggerating the "texture" of a rugged countenance, and they were ghastly, if I may say so, in their truth to nature. These were just the points that struck the non-technical man, for they suggested possibilities far beyond the reach of his brush; but, seeing in close juxtaposition to them such entirely different qualities placed for comparison, he had the common sense to confess himself beaten in a game he did not understand.

This is the common-sense man; but the "dummy" is one who, while not insisting on his own opinion against those of others, takes the liberty of differing from his fellow Judges in every instance, and of giving a little advice. "Now, if I were judging a painting or a drawing," he will say, &c., &c., for five minutes or so; "but in the case of a photograph it is different"—and then he will end by voting with the majority.

But the self-willed and pugnacious artist is the worst to deal with, and, unless he has as strong a mind as his own pitted against him, is likely to do damage. I met such a one some years ago, and I admit that, had I been single-handed against him, he would have been *the* Judge. There were three of us, and I the only photographer; the painter, a very good fellow, and now an A.R.A.; while the third was an art critic, and otherwise intimately connected with art, though, at the same time, full of sound common sense. In every class we had to judge, Mr. Painter invariably selected almost the very worst specimens, from a photographer's point of view, that he could find. The "sloppier" the execution, and the more absurd the conception, the better he seemed to like it; and his stock arguments were: "It's really very good for a photograph;" or, "Well, see how the poor fellow's hands were tied." It was fortunate that the other one of the trio was an old friend of the artist's, and could afford, or dared, to "chaff" him, and "talk like a father" to him with the result that we decided every case by the odds of two to one; and, after it was all over, the "minority" Judge remarked, in his most dignified manner, "Thank God, my reputation isn't at the mercy of you two fellows!"

But, painters as Judges or not, more or less difficulty will always remain in the classification of pictures; for even in any particular class, whether it be portraiture, "*genre*," "still life," landscape, or what-not, difference in style or treatment may go far to place two pictures beyond comparison. Again, although there is nowadays small excuse for slipshod manipulation, there is the difficulty of judging how far mere technique should operate against superior artistic treatment. For which reason, especially as medals have now become so common, I, for one, would willingly see them altogether done away with. DOGBERRY.

A MICROSCOPIC EXAMINATION OF THE VISIBLE CHANGES IN CHLORIDE, BROMIDE, AND IODIDE OF SILVER, UPON EXPOSURE TO LIGHT.*

[Photographisches Wochenblatt.]

If we undertake the task of studying the influence of light upon the above-named three haloid compounds of silver, with the intention of fully investigating the process in all its bearings, this cannot be accomplished in a partial manner, with, perhaps, the aid of chemical reagents only. We may, on the contrary, advantageously avail ourselves of other means to secure greater insight and to extend our knowledge.

For the following investigations we use a reagent that cannot be surpassed for delicacy, viz., Light.

We first examine the sensitive preparations by inactive light; then allow active light to work until a visible change takes place; and lastly examine the visible change.

It is evident that such slight changes can only affect the unaided eye in the smallest degree. Consequently we can only carry out these investigations, with the help of the microscope, almost exclusively.

In opposition to *chemical* reactions, investigations of this kind might be called optical reactions.

These optical reactions have a quite unique superiority over chemical reactions, and this lies in the fact that chemical reactions are always of a material nature, and therefore followed by material changes. Optical reactions, on the contrary, cause no perceptible material change whatever during the short period of observation. Against this advantage, of most sublime delicacy, must be set the disadvantage of the limited number of reactions. As experiments with polarised light have not hitherto given any results, the optical reactions are reduced to six methods of illuminating the object. These six methods are:—

A. Illumination from below:—
   1. Perpendicularly from below.
   2. Obliquely from below.
   3. Dark-field illumination.

B. Illumination from above:—
   1. Perpendicularly from above.
   2. Obliquely from above.
   3. Very obliquely from above.

As mentioned in the title, our investigations are concerning chloride, bromide, and iodide of silver. It is therefore our next task to prepare these substances in a condition of *highest purity*. We thus prepare:—

1. *Purest chloride of silver*, which is in particular *absolutely* free from bromide and iodide of silver.

2. *Purest bromide of silver*, which is *absolutely* free from chloride and bromide of silver.

* My friend Kogelmann, who died on May 11 last year, requested me a few days before his death to send this uncompleted investigation to the Editor of this paper should he be unable to conclude it. In consequence of other affairs, I have only just been able to comply with the request of the deceased. May the work receive from professional colleagues the recognition which, in my opinion, was due to all publications by the genial investigator—alas! so soon departed.
Graz, August 18, 1895. Professor FRANCIS EXNER.

3. Purest iodide of silver, *absolutely* free from chloride and bromide of silver.

These three substances are powdery precipitates.

Of *quite equal purity* we also prepare:*—

1. Crystallised chloride of silver.
2. Crystallised bromide of silver.
3. Crystallised iodide of silver.

All these substances must, of course, be prepared by red light, and, moreover, afterwards kept in absolute darkness.

Before we proceed with the proposed investigations, it is necessary to inform ourselves briefly from the purely chemical standpoint of the changes the above-mentioned three haloid compounds of silver undergo through exposure to light. We know for certain that chlorine, bromine, and iodine (?) are liberated and given off by the action of light. (This is very easily demonstratable with chloride and bromide of silver, but much more difficult with iodide of silver.)

Substances rich in silver are therefore necessarily produced from the normally constituted haloid compounds. But it will be readily understood that this excess of silver may exist in very diverse forms in the normal silver haloid.

Consequently it is of great value for our investigations that we can prepare *artificially* (without the action of light) silver haloids with an excess of silver. We can obtain these substances by fusing the corresponding haloid compounds of silver upon a support of purest silver (according to Stas).

This method, for simplicity and scientific value, can scarcely be surpassed, since it is purely physical, chemical means being completely excluded.

A. We first fuse the three haloid compounds of silver—the above-mentioned powdery precipitates—upon a glass support, or better, upon a plate of rock crystal. Of course, the three are heated separately, and guarded from strong active light. We endeavoured to obtain thin layers, and, after they had slowly set, we found the surface of each crystalline, and all three *quite clear* by transmitted and incident light. Iodide of silver, however, only sets quite clear in small patches. Chloride of silver is colourless, bromide of silver yellow, and iodide of silver darker yellow.

B. We now fuse the three haloid compounds of silver, taken from the same stock of powdery material, upon a support of purest silver, each, of course, being kept separate. We transfer the fluid masses to heated glass and allow them to set slowly as before. We again obtain layers with indications of crystalline structure on the surface, and all three are quite clear by transmitted and incident light. The chloride of silver is colourless, the bromide of silver rather browner than before, and the iodide of silver is more greenish.

C. Lastly, we again fuse our three silver haloids—each separately—upon a support of purest silver, drive up the temperature to the melting point of silver, and *then suddenly cool them with as much rapidity as possible by plunging them into cold water.*

We thus obtain broken-up fused products, pieces and grains of the most irregular form, but of most importance for us, we find the three different fused products are more or less intensely coloured by transmitted light.

Although it is possible to identify the colour of the fragments under an eyeglass, a microscope is indispensable for thorough examination. We therefore use the microscope, and examine one by one samples of our three fused products.

We illuminate first obliquely from above, using ordinary daylight. We notice, first, that the fused products we have obtained of the haloid compounds of silver *reflect light*, and that they are *dull*. Second, as shown by direct light, the colouration of all three compounds is very slight, partaking of grey and rather pale, resembling in a high degree the colour of certain kinds of calcedony. According to the degree of magnification, chloride of silver closely resembles flint, or a purer grey calcedony. Bromide of silver is decidedly more reddish-grey. It also resembles flint in colour—likewise grey, pale calcedony. Iodide of silver is more like dark-bluish grey calcedony. Under the microscope these three substances have quite different, distinctive colours by incident light; but the intensity of the colours is of very low degree.

We now illuminate our three silver haloids from below, consequently by transmitted light. All three show more or less intense colouration, therefore colours of a high degree of saturation. Chloride of silver appears violet, tending to grey. Bromide of silver is variously coloured, and particles lying near each other are blue-violet to grey-blue violet, green-blue, also pale red tending to grey, and yellow to yellowish-grey. Iodide of silver is dull carmine red (often bordering on greyish olive green); but, if we illuminate very obliquely (dark-field illumination), we see in the same sample fiery carmine red and intense, pure yellow.

After this description of the optical properties of our fused products, we will inquire into their chemical composition. The three fused products marked A are the perfectly pure haloid combinations of silver; the three marked B and the three marked C are also perfectly pure haloid compounds of silver, but *each of these compounds contains an excess of silver.* We may satisfy ourselves of this in a very simple yet certain way. We place the fused products one after the other under the microscope, and treat them with a solution of thiosulphate of soda of suitable strength.

Whilst we look through the microscope, the fused products marked A slowly but completely disappear, *and there is no trace of residue.*

The fused products, B and C, are also slowly dissolved, but there is a *residue* to each. We have not yet examined these residues for composition or quantity. It is, however, clear from the method of preparation that they must be substances very rich in silver—if not silver itself. We should estimate the quantity at three to five per cent. Resuming and collating the facts, we arrive at the following conclusion: *Chloride, bromide, and iodide of silver in the fused state have the property of taking up silver. The silver taken up and held by the normal silver haloids is in different conditions, according to the slowness or suddenness of the cooling of the fused products.*

The fused products, B, are clear. In thin layers, chloride of silver is colourless, and bromide and iodide of silver are slightly coloured. We are impelled to the idea, by the direct impression upon the eye, as well as the fact that only a small percentage of silver in excess has been taken up, that the liberated substance is transparent.

Whether the excess of silver is liberated as metal, or as sub-salt, we hope may be decided by examining its electric conductibility. But it is very remarkable that chloride of silver is quite colourless, and bromide and iodide of silver only slightly coloured, if either liberated metal or liberated sub-salt be present. Silver sub-chloride, for instance, is generally described as a dark, more or less deep violet-coloured substance. It would be extraordinary if the liberation of this substance in normal chloride were devoid of colour.

The fused products, C, appear *dull* by direct light. This fact demonstrates strikingly that we are not dealing with excess of silver in a *free state.* If we may be permitted to make a comparison by similarity of aspect, failing complete investigation, we are reminded of the appearance of a glass plate silvered in Bothe's manner, especially in the case of the fused products of bromide and chloride of silver. At the very first, the extremely thin film of silver deposited upon the plate appears brown by transmitted light. This extremely thin film, notwithstanding its slightness, can easily be recognised by its power of reflection, its glitter, when examined by incident light. As the film of deposited silver becomes thicker, the colour by transmitted light very soon turns to a very intense *blue.* By incident light the glass side exhibits the deposit of silver in its argentic whiteness, as a powerful mirror, but the back of the film is dull and grey. We see, on the one hand, by incident light, the high capacity for reflection possessed by thin silver films which likewise appear colourless (either glittering white or dull grey). On the other hand, we see the intense colour of these silver films by transmitted light. We must repeat that we only indicate, in this comparison, a certain similarity between two phenomena, and *nothing more.*

We now turn to our particular task: the study of the visible microscopic changes brought about in chloride, bromide, and iodide of silver by the action of light. First of all, it is palpable that our three powdery haloid silver preparations cannot, as such, be used for the intended investigations. For example, it is impossible to study with certainty slight changes in these *small, irregular* grains. Even a magnification of 2250 times linear is too weak, quite apart from other disturbing peculiarities.

As in a special degree suitable for our purpose we have found:—

1. Fused compounds in thin layers upon glass plates, or, better still, ground and polished rock-crystal plates.

2. The distilled compounds (distilled from a platinum support to a plate of rock crystal).

3. The crystals of these compounds, as they are to be obtained from aqueous solutions.

4. The *ripened particles*, especially of gelatino-bromide of silver emulsions. As material for preparation of the fused and distilled compounds, we use our three separate haloid silver compounds in the powdery state.

1. The fused compounds. For examination under the microscope—

* An exact description of the entire methods of preparation—and only such would be of value—would fill several pages, and be inappropriate here. We must therefore omit it.

and in particular if the most powerful immersion systems are to be used—it is our first task to spread the compounds, rendered fluid at high temperature, *in very thin* layers upon the slides, or upon the cover glasses (The appearance of such preparations, however, is seldom all that we might wish; but under the microscope we usually find a large number of places that are quite suitable.) Before we expose these preparations to light, it is, of course, our second duty to observe their *appearance before exposure*. We therefore endeavour to ascertain what can be seen by the naked eye, through an eye-piece, and through a microscope. These observations we make as thoroughly as possible by both methods of illumination, *i.e.*, *illumination by transmitted light*, and *illumination by incident light*.

With reference to the light itself by which we make these observations, that of petroleum, protected by a deep yellow chimney, has proved quite safe. Red light is very seldom necessary, and one may, in most cases, work by ordinary petroleum light. For certain purposes—as the precise determination of the colour of our preparations—the use of daylight is *indispensable*.

After we have informed ourselves sufficiently of the appearance o our preparations, we proceed to expose them. We expose to direct sunlight, allowing the rays to fall perpendicularly, and do not decide upon too short exposures, because at starting we wish to obtain very marked phenomena.

After exposure we proceed with the second examination of our preparations, to ascertain the changes brought about by the action of light.

We shall, of course, use for each preparation illumination by transmitted, and illumination by incident, light.

A. *Fused chloride of silver.* (*a*) Appearance before exposure. By transmitted and incident light fused chloride of silver appears quite *colourless* and quite *transparent*. (*b*) Appearance of a layer of chloride of silver after exposure to direct sunlight for the space of one minute (to a maximum of two hours). By transmitted light there is intense colouration—ultra-marine blue; by incident light the layer is dull, *i.e.*, it reflects light, and is yellowish to reddish-pale brown grey. After longer exposure, thicker layers are almost opaque, and by incident light they appear pale-reddish grey. FRANZ KOGELMANN.

THE THEORY OF DEVELOPMENT.

A CRITICISM ON A PAPER BY MR. EDWIN BANKS.

I HOPE that the remarks I am about to make will in no way be regarded as personal. It is only by making experiments, and thus gradually increasing our knowledge, that we can expect some day to elucidate such a subject as the reason why a developer, as we call certain reducing agents, can reduce to the metallic state those portions of bromide of silver in a gelatine film that have been exposed to the light.

My only object in criticising Mr. Banks's paper on this subject is to show where I think he has erred, and where I consider a simpler theory on modern views will explain what takes place.

I have taken as the basis of my remarks the paper as published in the *Photographic News*, and for convenience of reference have numbered the different paragraphs as they stand (1 to 15). and where necessary shall quote in full the text as there given.

The first six paragraphs require no comment, as they are merely introductory, but in paragraph 7 we come across the statement that, "when a solution of pyro was applied to an exposed plate, metallic silver was reduced on the film and bromine was liberated. It was this liberated bromine that tanned the gelatine, and that this was so was proved by the fact that it was only when the silver had been reduced and the bromine liberated that tanning occurred." *Bromine was liberated.* This statement would naturally lead any one to infer that the element itself was set free, and was capable of attacking or combining with that substance present for which it has the greatest affinity. It must be remembered that in all cases of development, when using gelatino-bromide plates, an alkali or a carbonate of an alkali is present, and, according to Mr. Banks, the bromine thus liberated has a greater affinity for the gelatine than it has for the metal of an alkali, and that the compound formed by the action of bromine on gelatine is the cause of the tanning of those parts of the film where light has fallen. I venture to think that bromine, as such, is never set free during the development, happen what may to the bromide of silver during exposure. Any one can easily prove for himself who possesses a test tube and a thermometer that oxidised pyro renders gelatine insoluble, by soaking a small piece in a solution of ammonia-pyro, as usually employed for development, for half an hour or an hour, and then placing a portion of it in the test tube partly filled with cold water; the thermometer should then be inserted into the test tube and test applied. The temperature at which the dark-coloured portions of the gelatine go into solution will give what is required. Soak another portion of the original gelatine in tap water for the same time, and find in the same way the temperature at which this dissolves. A marked difference will be observed. In some experiments I have made the temperature at which the original gelatine went into solution was 35° C, and the gelatine treated with ammonia-pyro solution for 30 minutes 85° C. At the end of two hours' soaking in the gradually oxidising ammonia-pyro solution, the gelatine refused to go into solution at the boiling point of water. When a plate has been exposed to light there the developer, when applied, will be most rapidly oxidised, and that portion of the gelatine surrounding the reduced silver will be in contact with oxidised pyro; this will be taken up by that gelatine and become tanned. Condensing into a few words what I have already said, the matter stands thus:—Oxidised pyro renders gelatine insoluble; during development pyro is oxidised in reducing bromide of silver to the metallic state, and this oxidised pyro tans the gelatine when the reduction takes place. This is very well illustrated by taking the development of a plate exposed on a line subject. During the development the silver is reduced on those portions of the plate corresponding to the white paper; then pyro will be oxidised, and will attack the gelatine; the silver bromide corresponding to the black lines of the original will not be reduced, and tanning will not take place. Let us now consider what is happening to the bulk of the solution. The dish is rocked, oxygen is absorbed, and the pyro in this portion of the developer is also being oxidised; but this is a comparatively slow process, but, nevertheless, it will exert a certain influence on the whole of the gelatine; it will tan slightly the gelatine corresponding to the shadows, and increase the insolubility of the tanned gelatine in contact with the reduced silver, thus still further raising the melting point of the image gelatine.

Mr. Bolton, in a letter to THE BRITISH JOURNAL OF PHOTOGRAPHY of the 23rd ult., details some experiments he recently made, and ascribes the result to the action of light. He took two tubes, into which he poured a mixture of gelatino-bromide, pyro, and carbonate of soda. The gelatine was allowed to set. One tube was kept in the dark, and the other was exposed to light. On testing these it was found that the contents of the tube exposed to light went into solution at a higher temperature than the other. This is explained by what precedes, and is just what I should have predicted had I been asked. Light undoubtedly is the prime cause, but it has no action in causing the insolubility of the gelatine, but by its action it has rendered the salt of silver susceptible of reduction, and in being reduced the pyro has become oxidised. I thank Mr. Bolton for the slight modification of conditions, and am sure that his experiment will have some weight in convincing others of the truth of what I have said, though at the time he made the experiment he did not think the result agreed with our explanation.

In order to test what I have here advanced, the following experiment was made:—A plate was cut into two unequal portions. The smaller we will call A. The larger portion was then wrapped in black needle paper, so as to cover and protect from light about half of it. The uncovered portion was then exposed to a gas flame at a distance of three feet for five seconds. A developer was made up, consisting of

Pyro	3 grains.
Bromide	2 ,,
Ammonia	3 minims per ounce.

At the moment the exposed plate was flooded with the developer, portion A was soaked in cold water. Development was allowed to continue till the exposed portion was fairly dense. It was then washed, and at the end of ten minutes strips were cut from A, the exposed and developed part, and from that portion that had been soaked in the developer, but which had been protected from light, and which, therefore, had no silver reduced in it. A test tube was then partly filled with cold water, one of the strips introduced, a thermometer inserted, and the melting point of the gelatine determined. This was done for each of the strips, and the temperature obtained I have given below. In order to avoid complication, especially as sulphite was not mentioned in connexion with "the theory of development," no sulphite was added to the developer.

	Melting Point.
Portion A	65° C.
,, soaked in developer, but not exposed to light	70° C.
,, exposed and silver reduced (not dissolved)	100° C.

The melting point of the gelatine in case A is very high, but this is undoubtedly due to the use of chrome alum in the emulsion, as these results were obtained when using commercial plates.

Not having time to prepare any emulsion myself, I asked Mr. Bullen, of the Gem Dry Plate Co., if he would kindly favour me with a Gem plate coated with emulsion, free from chrome alum. I received the plate yesterday morning, and the results I obtained are as follows:—

	Melting Point.
Portion A	40° C.
,, soaked in developer, but not exposed	40 to 45° C.
,, exposed and silver reduced (not dissolved)	100° C.

When the contents of the tube had reached about 45° C., a thin skin left the surface of the emulsion, and only went into solution at 87° C,

This thin layer of gelatine was tanned by the oxidised pyro in the bulk of the solution.

The explanation given by Mr. Grundy and myself, that the tanning action is due to oxidised pyro, does not in any way fail to explain what takes place in Mr. Warnerke's process, and the results of the experiments just cited give the reasons; but I venture to think that, if, in the case of an under-exposed plate and prolonged development, in order to bring out all that the developer can, we were to attempt to develop with warm water, we should not be able to remove the whole of the gelatine from those parts corresponding to the shadows, as then the oxidised pyro of the solution will have so tanned the gelatine that it would require a very much higher temperature in order to cause it to go into solution, and, if the bulk of the pyro had been oxidised, that water near the boiling point would fail to dissolve it. This is only my impression, as I have not worked this process, and it would be very interesting to all, as it is now worked for a certain photo-mechanical process, if we could obtain some information on this point; it would tend still further to clear doubts that may still exist in the minds of some.

Paragraphs 8, 9, and 10.—I find it most convenient to take these three paragraphs together. Here Mr. Banks deals with the effect of light on bromide of silver, and at once dismisses the sub-salt theory and advances his own, which is that bromide of silver, previous to exposure, has the atom of silver covered as it were by the atom of bromine, but during exposure the one is shifted with regard to the other; and the silver is now partly exposed and capable of being separated from the bromine when a developer is applied. This is a very pretty mental picture, and, if it were true, the sensitiveness of bromide of silver would be identically the same whatever the medium in which it was supported on the plate; but we know, as a fact, that bromide of silver prepared in identically the same manner, surrounded in one case by collodion and in another by gelatine, has very different speeds in these two media. In any case, it seems necessary, in order to obtain the maximum sensitiveness, to associate the salt of silver with some halogen absorber, or a body which is ready and eager to take up oxygen. Chloride of silver, prepared by suspending silver leaf in moist chlorine gas, will not change colour however long it may be exposed to the light. Iodide of silver, such as was used for the Talbotype process previous to the application of the gallo-nitrate of silver, was absolutely unchanged when exposed to light; in fact, according to some authorities, it was improved in quality by such treatment. If silver leaf were iodised, as in the case of the Daguerreotype process, till the whole of the silver was converted into silver iodide, it would be impossible to obtain an image on it. In each of these cases, before any reduction can be effected, it is necessary during exposure to dispose of the liberated halogen; if this is not done, the silver salt is in exactly the same condition as it was before exposure. In the case of the wet-plate process, the free nitrate of silver is the iodine absorber. When printing on albumenised paper, it is necessary to have a considerable excess of nitrate of silver or its equivalent, if not, the image is weak and mealy. The sliding of the atoms of bromine and silver over each other during exposure to light is not a sufficient explanation, as it will not explain many facts that we are acquainted with.

I am, at present, more inclined to believe in the sub-salt theory, as, according to it, the medium would account for the same compound being more sensitive in one case than in another. When bromide of silver is exposed to light for some time, a change in colour takes place. If a change of colour takes place by the prolonged action of light, why should it not, only to a very much smaller extent, take place when light acts for a short time? The change may be invisible, in consequence of the dulness of the light in which the examination must of necessity be made. According to Mr. Banks we are compelled to have one theory to explain what takes place when light acts for a short time, and another when light is allowed to act for a much longer time, since he will not admit that decomposition takes place. What is true for a short exposure ought to be true for a longer one also. If I understand Mr. Banks correctly, he led us to believe that by prolonged action of light the bromine is slipped so far off the silver that the latter is no longer protected by the bromine or iodine, and, in the case of the Daguerreotype process, the vapour of mercury is able to condense on the metallic silver and form an amalgam. If the silver be thus practically set free, what becomes of the bromine? The answer will be most probably that the bromine, in the case of gelatino-bromide plates, acts on the gelatine and renders it insoluble. The medium is, therefore, inactive with small exposures, where we most require a bromine absorber, or a body capable of disposing of it, but active when a flood of light falls on the plate and is but little needed.

Mr. Banks says in paragraph 8: "They had to consider first the constitution of the undeveloped image. It has been supposed to consist of sub-bromide of silver, but this was a mere assumption, and it had not been proved. The German chemist, Guntz, was the only individual who had been recorded to have produced silver sub-bromide." In 1885, Captain Abney read a paper before the Photographic Society of Great Britain, and in it he tells us that his friend, Dr. Hodgkinson, of Woolwich, had managed to isolate both silver sub-chloride and silver sub-bromide, and that on analysis some of the constituents came to within one per cent. of the theoretical amount. One per cent. is not a very large error, and, when a substance during analysis comes as close as that to the theoretical value, we ought, I think, to be satisfied that the body is what it is represented to be. The existence of sub-salts does not rest on such a bare statement as Mr. Banks mentions, but this paper may have escaped his notice.

Edmond Becquerel, in *La Lumière, ses Causes et ses Effets*, published in 1868, vol. ii., page 62, gives the results of two analyses of sub-chloride of silver. He prepared his sub-chloride by acting on recently precipitated silver by chloride of copper, and obtained by analysis:—

Silver	85·3
Chlorine	14·7
	100·0

The sub-chloride was converted into chloride by means of aqua regia. In the second case 1 gramme of the body was acted on by ammonia, which decomposed the sub-chloride, giving a residue of metallic silver, and chloride of silver was dissolved by the ammonia. The metallic silver weighed ·42 gramme, and the chloride of silver weighed ·56 gramme; the chlorids of silver consisted of silver ·423 gramme, chlorine ·137 gramme, so that his sub-chloride consisted of—

Metallic silver	·843
Chlorine	·137
	·980

So that during the analysis he lost two centigrammes.

Theoretically he should have obtained—

			Mean of I. & II.
Silver	·859	...	·848
Chlorine	·141	...	·142

Wetzlar, in 1847, produced in a similar manner violet-coloured flakes, using silver leaf.

According to Watts, bromine and iodine do not render gelatine insoluble. This, as Mr. Grundy and myself have already, in another paper, pointed out, is not strictly true. Gelatine is made insoluble by the action of bromine water, and not by a plain aqueous solution of iodine, or by a solution of iodine in iodide of potassium. We are pleased to see that Mr. Banks confirms this statement; but I fear he has carried the idea a little too far in ascribing the tanning action that takes place during development entirely to the action of bromine.

In vol. ii., p. 828, *Watts's Dictionary of Chemistry*, under the heading of "Gelatine," you will find the following: "When a current of gaseous *chlorine* is passed through a solution of gelatine, a white pellicle forms round each bubble of gas, and the whole of the gelatin is finally precipitated in flexible, elastic, nacreous, gelatinous, transparent flakes or filaments (Thénard, Bouillon-Legrange). The precipitate is tasteless, slightly acid, putrescible, insoluble in water and in alcohol, and soluble in alkalies. On exposure to the air it exhales an odour of chlorine." "No similar products are obtained by substituting bromine or iodine for chlorine." From this I was led to believe that the chlorine entered into combination with the gelatine, and was decomposed by exposure to air, and that, since bromine also produced a similar insoluble compound, the bromide combined with the gelatine to form an analogous body. At the meeting of this Association, on October 22, there was present a chemist, Mr. Townsend, F.I.C., who threw out a hint that most probably the insolubility of the gelatine was due to oxidation, and not due to a definite compound formed by the action of the halogen on the gelatine; but, when I told him that the body was said to smell of chlorine, he was in doubt as to whether oxidation was the true cause. As this seemed to me to be a point worth clearing up, I have made a few experiments in order to arrive at some definite conclusion as to what is the cause of the insolubility of the gelatine. I made some bromine water and then soaked in it some Nelson's No. 1 photographic gelatine. The gelatine was then washed by repeated soakings in tap water so as to get rid of all free bromine and hydrobromic acid, if formed; the insoluble gelatine was then placed in a large beaker, with about 400 c. c. of water. The gelatine, to start, weighed about four grammes. The beaker was then placed in a vessel in which water could be boiled, and was kept boiling for about an hour. The contents of the beaker must, therefore, have been raised to near the boiling point during the greater part of this time. At the end of the time the contents of the beaker were poured on to a filter paper and allowed to drain, the gelatine was then washed with two changes of cold water and allowed to drain for two days. After the boiling the gelatine was much less horny than it was at first, and, if the boiling had been continued for another hour, most probably the bulk of it would have gone into solution. In order to test for the presence of bromine in combination, the gelatine was mixed with binoxide of manganese and sulphuric acid in a flask, and the gas that came off from the mixture was passed into water. After the bubbles had been passed through the water for about ten minutes, some chloroform was added and the two shaken together. If any bromine had been present in the water, it would have been taken from it by the chloroform, and the latter would have been tinged more or less yellow by its solution; but not the slightest tinge was visible, so that I conclude from this that bromine does not, under the above conditions, combine with gelatine, and that the tanning of the gelatine is due simply to oxidation, as in the case of carbon printing. Most probably negative results would also have been obtained if chlorine had been substituted for the bromine water, but I may have,

by the prolonged washing and boiling, decomposed the compound formed during the soaking of the gelatine in the bromine water.

Seeing that gelatine is rendered insoluble by oxidation, I tried again other oxidising agents.

Peroxide of hydrogen seems to have but little effect on gelatine.

Permanganate of potassium tans it and produces a deep yellowish-red stain. Gelatine tanned with this salt refuses to go into solution at 100° C. Thirty volumes of hydrochloric acid and seventy volumes of water reduces the melting point to about 80° C.

A dilute solution of chromic acid also has the power of rendering gelatine insoluble in boiling water, and this is, I presume, the reason why, in the carbon process, it is always recommended to add sufficient ammonia to change the colour of the bichromate to yellow, that is, to neutralise any chromic acid that may be present.

In paragraph 11, Mr. Banks refers to the original form of cell devised by Volta, the zinc-copper sulphuric-acid cell, and says: "The action of the battery was to decompose some of the atoms of water, and the liberated hydrogen adhered to the copper or negative element, and, covering it, prevented further access of the fluid, and the action ceased." The electro-motive force of such a cell is 1·03 volts before it has been used to send a strong current through the external circuit; after it has been used to send a current of about from one to two ampères for some minutes, it falls to about ·63 volt, but on breaking circuit it very rapidly regains its original electro-motive force. I am perfectly well aware that text-books as a rule very much depreciate the value of this simple cell, but, if any one who has the necessary instruments and time will take the trouble, he will find that such a cell, immediately after short circuit, and long before it can recover itself, has an electro-motive force of about $\frac{1}{3}$ volt. Its action, therefore, does not cease due to polarisation.

Paragraph 12.—I thoroughly endorse Mr. Banks's explanation of the action of pyro on water, and water on bromide of silver, if we leave out the electric current. We have practically two unstable bodies—light-struck bromide of silver (whatever its composition) and pyro. The one is willing to part with its bromine and the other is eager to absorb oxygen. By the kind intervention of water and its decomposition, both can be satisfied. Hydrobromic acid is formed on the one hand, and pyro is oxidised on the other, metallic silver (probably) being set free. This theory is not new, for we find in *Brande and Taylor's Chemistry*, published in 1863, p. 605, the following sentence explaining the development of a wet-collodion plate: "The iodine is removed from the iodide, and it must be removed either as iodide of silver (AgI), or, on the assumption that water is decomposed, as hydriodic acid (HI), the oxygen of an atom of water being taken by another portion of the pyrogallic acid." From this quotation it will be gathered that thirty-three years ago water was looked upon as the developer in the case of wet-collodion plates developed with pyro; whether we should now explain the action in the same way is outside the question I have to deal with to-night. What I want most particularly to call your attention to is, that thirty-three years ago water was regarded as the developer, and not the pyro.

In paragraph 7, as I have already explained, Mr. Banks ascribes the tanning action to liberated bromine. In paragraph 12 the bromine is disposed of by combining it with the hydrogen of the self-sacrificing water, and forms hydrobromic acid. If it does the one it cannot do the other; in fact, the one statement is dead against the other. I am entirely in agreement, as I have already said, with the explanation in paragraph 12, but I cannot accept the other. The gelatine is not, therefore, tanned by bromine; we both now agree on this point; and, since it is tanned, it must be tanned by oxidised pyro, as this body has, among others, this property. The only other body present that could tan the gelatine is hydrobromic acid; that, judging by analogy, is out of the question, as, of all reagents I have employed in order to endeavour to soften tanned gelatine, hydrochloric acid is one of the few that will lower the melting of gelatine in this peculiar condition.

In the early part of paragraph 12 Mr. Banks says, "The atoms of the silver bromide on the one side, and the hydrogen atoms of the pyro on the other, constitute the elements; a weak electric current was established, which decomposed some of the water of the developer, the liberated oxygen of the water combined with the hydrogen of the pyro, the liberated hydrogen of the water—not of the pyro—combined with the bromine of the bromide of silver to form hydrobromic acid." I have always understood that, in order that a current may flow, it is necessary to have a complete circuit. In the cell, as imagined by Mr. Banks, we have a current passing from the hydrogen of the pyro, through the water to the bromide of silver, the hydrogen of the pyro corresponding to the zinc plate in an ordinary cell, and the bromide of silver to the copper plate; the question I have to ask here is, How does the current return? The mere immersion of two plates, however different, in the same solution, or in two different solutions separated by a porous disphragm, is not sufficient to generate a useful current of electricity. Major Waterhouse some years back showed that a current of electricity flowed from the bromide of silver, which formed the shadows of an exposed plate, through the liquid towards the light-struck bromide, also through a galvanometer and connexions back, but this is a very different case. We must have contact; some have to form the complete circuit, but in the case of Mr. Banks's cell there is no complete circuit.

M. Becquerel, in the work I have already mentioned, tells us how to make an electro-chemical actinometer. It consists of two plates of pure silver, covered with iodide, bromide, or chloride of silver, prepared by immersing the plates in a dilute solution of chloride of copper, or by placing the plates in a dilute solution of hydrochloric acid, and passing a current, the silver plates being connected to the positive pole of the battery. The plates are then short-circuited, till they yield no deflection when connected to the terminals of a sensitive galvanometer. The plates must be prepared in a dark room, and during their use all light, excepting that useful for the experiment, must be excluded. The plates and containing cell were enclosed in a metal box, having a slit at one side, which slit could be closed or opened as required. The plates during the experiments were immersed in two per cent. of sulphuric acid. When everything was ready and light was allowed to fall on one of the plates, a current was produced which deflected the needle of the galvanometer, the deflection varying with the intensity and the colour of the light that fell upon the plate. When the plates were properly prepared, and a sensitive galvanometer used, the deflection obtained by exposure to sunlight amounted in some cases to seventy-five per cent. What this deflection means we cannot say, as these experiments were made before the present electrical units were introduced. We see from this that, when two plates identical in every respect are connected together, a current passes one to the other when exposed to light.

If it is necessary that there should be a current of electricity for development to take place, then, since each particle of bromide of silver is isolated by a film of gelatine, and bromide of silver is not perfectly transparent, the front portions of each particle of bromide up to certain depth will be light struck and the back will scarcely be modified. When this particle of silver bromide comes into contact with the developer, the whole will form a microscopic cell, and then the action which Mr. Banks points out might take place. On the formation of metallic silver in contact with the bromide of silver, sub-bromide would be formed, and this would in its turn be reduced till the whole of the particle was converted into metallic silver, more or less completely.

Paragraph 14. Here Mr. Banks gives us something new, but at the same time it is easy to account for the results. Nascent hydrogen, the same as all other nascent elements, is far more energetic than it is after it has gone into the molecular condition; now, it should not matter how the hydrogen is obtained, provided it is set free in that peculiar energetic form, the nascent state. Hydrogen is formed by electrolysis, attacks the bromine, and so the silver is set free in the metallic state. When plain water is used, in consequence of its high resistance, the strength of the current would be very small, and, in addition, would most probably very soon cease in consequence of the film of oxide of zinc (insoluble in water) formed on the surface of the positive plate.

Paragraph 15. It is indeed unfortunate for us that development should have received the scant attention it has from our best chemists. It is a very difficult problem to attack, and this may be the reason why it has been neglected. The separation of the products of oxidation at different stages seems insuperable, but nothing is impossible in the hands of a man who knows his work and is willing to attack the subject. Pyro in combining with oxygen forms, undoubtedly, a number of different compounds, depending on the extent to which the oxidation is carried; but I doubt whether purpurogallin is formed in the early stages. In order to produce purpurogallin, it is necessary to act on *plain* pyrogallic acid with a powerful oxidising agent, such as permanganic acid, chromic acid, nitrate of silver, &c. The body obtained is but feebly soluble in water, but is dissolved by ether, benzole, &c. If, therefore, a solution of pyro be oxidised gradually and we shake portions of it, at intervals, with ether, we ought to be able to extract the purpurogallin. The only case in which I have been able to obtain a colouration of the ether by purpurogallin was when the pyro was oxidised by means of bromine. By repeated treatment of a bulk of pyro thus oxidised with ether, I was able to prepare a small quantity of this substance, and, on soaking gelatine in an aqueous solution for fifteen hours, found that the gelatine went into solution at 85° C., whilst gelatine treated with pyro oxidised in the presence of alkali rendered it insoluble in boiling water. The same solution of oxidised pyro, alkali being present, gave no colouration to ether, proving, to my mind, that purpurogallin is not formed, at least, in the bulk of the solution. A very small quantity may be formed where the development takes place; but even this remains to be proved. Purpurogallin is a body capable of being crystallised, and sublimes at 200° C., when it gives, so it is said, beautiful *red* needles.

When ammonia is used as the alkali with pyro, it is far more likely that *pyrogallin* should be formed in the bulk of the solution than purpurogallin, as such a solution, when oxidised at no stage, as far as I can ascertain, yields colouring matter to ether; and, in addition, as I have already said, such a solution renders gelatine far more insoluble than does purpurogallin. The only mention I can find of pyrogallin is in Watts's *Dictionary of Chemistry*, and none of its properties are mentioned, but the conditions laid down for its formation are just those that obtain in the case of ammonia-pyro development—that is, slow oxidation by air. When air is bubbled through pyro-ammonia for days, it yields no colouration to ether.

I cannot understand how pyro by oxidation at any stage can yield carbon, and to this element Mr. Banks ascribes the yellow stain in

gelatine negatives. If carbon were the colouring matter, it would not render gelatine less soluble than it is when unheated, as the carbon cannot be there otherwise than as a mechanical mixture, and a mechanical mixture of this kind could not so entirely alter the properties of the gelatine. When plates are developed with pyro-soda, no sulphite being present, the gelatine is very much stained. Now, the bulk of this stain can be temporarily altered by means of hydrochloric acid, but on soaking in water, or by the application of an alkali, it returns with full vigour. Again, if a solution of ferrous sulphate be applied to a recently developed plate, the colour of the image is changed. The change in colour may be due to a combination between the iron salt and the oxidised pyro or a reduction of the oxidised pyro, and then a combination between it and the ferrous or ferric sulphate. If the colour were due to carbon, it could not be modified, as we are all well aware that carbon is one of the most stable bodies we can deal with.

Before concluding. I should like to give Mr. Bolton the explanation of the insolubility of the gelatine in a piece of solsrised gelatino-chloride paper.

Scheele discovered, many years before we were born, that if chloride of silver be exposed to light chlorine is set free; similarly, when gelatino-chloride paper is exposed to light, chlorine is set free, and, as I have already quoted, chlorine renders gelatine insoluble, probably by oxidation; therefore it is not astonishing that the gelatine, in contact with the chloride of silver exposed to light, should go into solution at a higher temperature than the unaltered gelatine on the rest of the paper.

Mr. Grundy, I may say, is in perfect accord with me in all that I have advanced in this paper. A. Haddon.

ACETYLENE.

[Newcastle and Northern Counties Photographic Association.]

There can be no doubt that in the very near future acetylene gas will be largely used for the purpose of lantern illumination; in fact, at the present time it is very largely used. The fact that the light is of such intense whiteness that when burning it has no smell, that it is, using the proper apparatus, simply and safely produced, and, I should like to say that, after a great deal of inquiry and experiment, I think it is absolutely safe, and that once lit up it requires no attention, will go far to recommend it to those who have a natural abhorrence to the foul smell of the paraffin lamp, which gives intense heat, and smoke making everything and everybody black in the room.

Lanternists in the past have had the choice practically of (1) the oil lamp; (2) the limelight, using ordinary coal gas, and oxygen, using a blow-through jet; (3) coal gas and oxygen combined, using a mixed jet; and (4), during the past few years, the incandescent mantle.

To those who live in the country, where no coal gas is obtainable, they have practically had to choose between the oil lamp and the mixed jet.

Now, there is a common belief, which is altogether an erroneous one, that the mixed or high-pressure jet is more dangerous than the blow-through. This is really not so; but it is surprising how difficult it is to remove an impression once made. It appears to me that a great many accept statements which are too often made, I am sorry to say, without due examination and experiment, and will not think for themselves. I am perfectly aware we are not here to-night to discuss the merits of the mixed jet; but, as I have pointed out, many of our friends had to choose between oil and the mixed jet; the former they disliked, the latter they were afraid of. It is perhaps particularly to them that acetylene comes as a boon and a blessing; they are now able, a few minutes before their lecture commences, to generate their own gas (I mean the gas for the lantern, not the other sort which they often inflict on the people). Now, while we must admit that we have got a wonderful light in acetylene, while we welcome it as an additional power to the lantern, do not let us lose our heads over it, as I am afraid many did over the incandescent mantle. You will remember that, when the incandescent mantle was brought forward as a possible lantern illuminant, people wrote to the photographic Press saying all sorts of extravagant things about the light. Some of the more discreet limited the light to photographic enlarging, for which purpose I will admit it is excellent. Others, more bold, said that a brilliantly illuminated disc of six feet could be obtained, which was so suitable for using the lantern in the house. A six-foot disc can be obtained, but I have never seen one anything like brilliantly illuminated. But the bolder ones still declared that it was suitable for public exhibition, that it would give a clear disc of eight to twelve feet in diameter, and was in every way equal to the lime light.

Now, I have had a fair experience with all the lights used in the optical lantern, and I challenge any man to produce a twelve, aye, or an eight-foot, disc brilliantly illuminated with the incandescent mantle. This is precisely the reason why I wish to guard you against any excessive praise of acetylene gas. As I said before, while we welcome it as a new power, we must also admit that, although it is superior to any oil lamp on the market, it is slightly inferior to the light produced from a blow-through jet. It is said that, using two optical burners made by Bray, placed at right angles to each other, a light of 200 candle power is obtained. As perhaps many of you are aware, the best oil lamp only gives 125 candle power.

But, even if it is slightly inferior to lime light, its advantages are many. In the first place you are not troubled with the carriage by the railway companies. The railway companies in their wisdom adopted a very stringent rule with regard to compressed gases. They will not allow a passenger to take his cylinder in the same train (mark me, not the same carriage) as passengers' luggage. This he could do without payment, and it is dangerous; but he may book his cylinder as a parcel, send it by the *same* train, pay the carriage, and it is not dangerous, at least, I suppose so, otherwise the company would not carry at all.

This question of carriage has always acted as a deterrent to many, and I do not wonder at it, so that acetylene comes as a welcome friend to all who move about from place to place and carry their apparatus with them. No one can prevent you taking your gasometer in the carriage with you, as it is portable and empty, the calcium carbide with which you make the gas can be carried in an old coffee tin, and all you require at the other end is water, and you are ready to begin; so that, even if our light is not quite so strong, it has many other advantages. Do not forget also that at present we are only beginning to find out the value of acetylene; in the near future, no doubt, the light will be vastly improved. To me it appears that the most serious objection is that the area of incandescence is too large. So soon as the light can be centered more to a point, so soon will we have a more perfect light.

For the purpose of making my paper to-night very plain, and, I hope, very instructive, to all, I will divide it into—

1. The production of acetylene gas from calcium carbide.
2. The apparatus necessary to produce the light.
3. Its advantages and disadvantages.

And 4, and perhaps the most important of all, the safety of the gas.

First, then, let us consider how acetylene gas is produced. Calcium carbide is made by heating together in an electric furnace for eight hours, at a temperature of from 4000° to 5000°, common lime and coal dust. The compound produced is calcium carbide, and bears the formula of CaC_2. Calcium carbide as it is sold commercially is very hard—so hard that one gentleman has suggested a steam roller to crush it—of a greyish colour, and a peculiar though not very strong smell. It is necessary to keep it in air and damp-tight tins, as it is very unstable; is easily decomposed by water, acetylene being given off and lime left as a residue. It has been stated that Thomas Leopold Wilson, a Canadian chemist, accidentally discovered acetylene by throwing a piece of calcium carbide into water, and, struck by the violent action set up, pursued his investigations with the result which we all know.

Acetylene has a chemical formula of C_2H_2, and the chemical action is as follows: The oxygen of the water combines with the calcium, forming lime; the carbon combines with the hydrogen, forming acetylene.

The characteristics of acetylene are that it has a most pungent, to many disagreeable, odour resembling garlic: it is colourless, and burns when free from air with a steady and intensely brilliant white light. Many people have raised as an objection to the use of acetylene its disagreeable smell. In my opinion this is one of its greatest points. Recollect that acetylene when burning has no smell, so that, if there is a smell, you know that some of the gas is leaking, and can take precautions accordingly.

When mixed with air it is highly explosive, the proportions varying, but the most explosive mixture is about one to twelve. Mixed with coal gas it greatly increases its brilliancy. As to its poisonous properties, opinions appear to be divided, some scientists giving it as their opinion that the gas is not poisonous, others that it is. This is a matter for further experiment.

One point where acetylene distinctly scores is that it gives off practically no heat; we all know the inconvenience of standing over an oil lamp for two hours.

Passing on, we will now consider the apparatus necessary to produce the light. I have already told you that the gas is produced by the action of water on calcium carbide. There are at the present time many forms of generators in the market, all, of course, claiming to be the best, but to-night I will speak only of one, that is the Incanto generator, made by Thorn & Hoddle. I do not say it is the best generator. Why I recommend it is because I think it is the best and safest, because the makers are thoroughly practical men, who before placing it on the market practically tried and positively proved that no accident could occur if the generator was used according to the very simple instructions sent out with it, and lastly because I have worked with it myself, have unbounded confidence in it, and therefore can recommend it to your notice. I have here to-night, on the table, one of those lantern generators, and also one of the special fittings for the lantern. You will notice the generator consists of a cylinder about eighteen inches high and eight inches in diameter. This generator is made to hold sufficient carbide to give a light, with the two special burners supplied, for two hours or more. I will now describe the apparatus.

When the action first commences the gas is mixed with air, or rather the air in the generator is forced out by the gas formed. It is therefore advisable to wait a few minutes until the air has been driven out of the apparatus. You can easily tell when the air has been expelled, by the unpleasant smell of the acetylene. Now apply a light, but you will not

obtain the maximum of light for quite five minutes. Now place it in your lantern, focus and centre it, and it can be left alone. Do not expect too much; do not forget, what I told you at the commencement, that the light is not so good as the lime light, though very nearly so, and this leads one to the advantages of acetylene.

First of all, the intense whiteness of the light, then the wonderfully easy method of production, then the extreme portability of the apparatus, no railway or other restrictions, the saving of carriage, the doing away with all regulators and cylinders; and, lastly, the very low price at which the gas can be produced. One pound of calcium carbide will produce five cubic feet of gas, and this is sufficient for two hours' entertainment, costing, at the present time, from 7*d.* to 10*d.* per pound. No doubt, in the near future, the cost will be considerably reduced. With the exception of electric, acetylene consumes far less oxygen than any other illuminant.

It gives off no carbonic oxide, consequently picture frames, wall papers, decorated ceilings, &c., are not affected, as is the case with coal gas. The light is steady, noiseless, nearly smokeless, and well diffused, practically the same as sunlight.

Surely these are very great advantages to claim for the new gas.

Disadvantages, I think, it has none.

I have now arrived at that very important part of my paper when we must take into consideration the safety of acetylene, for of what use are all its advantages if it endangers human life? I think you will agree with me, gentlemen, that it is best to speak with very great caution respecting a gas which is occupying so much of the time and energy of our great scientists; but I do wish to state that, in the present state of our knowledge, and using the particular generator which I have to-night, there is absolutely no danger that I know of. I would not speak so positively had I not studied the matter thoroughly, but I can strongly recommend all of you to use this gas, and feel sure you will be quite safe in doing so.

Let me try and make myself more plain. I have already told you that the gas is highly explosive when mixed with certain proportions of air. This is so. But consider, after you have expelled the air from this generator, there is no air, what is then coming off is pure acetylene. How, then, can you have an explosion? The makers say, and I quite agree with them, that it is impossible to have an explosion with this form of generator.

No doubt, many of you have read of the regrettable and fatal accident which occurred quite recently at the works of M. Rouil Pictet in France. I think I am correct in saying that this took place while endeavouring to compress acetylene into cylinders, the same as we compress oxygen and hydrogen. MM. Berthelot and Vielle have proved that at ordinary pressure acetylene does not detonate, but that, as the pressure increases, so does the chance of explosion. But why have compressed acetylene? It is so easy to produce that it is not necessary to carry it about in a compressed state. In every case that I know where an accident has occurred it has been whilst experimenting with the gas, and not whilst using it in such a generator as I show you to-night.

Gentlemen, you have the advantage of those experiments. Do not experiment yourselves; follow out the simple instructions given for your benefit, which have been arrived at very often at the cost of the brave men who have risked and sacrificed their lives for the benefit of science.

JOHN WATSON.

PHOTOGRAPHIC EXHIBITION AT ST. PETER'S INSTITUTE.

THE flourishing Institute in connexion with St. Peter's Church, Eaton-square, S.W., held on November 9, and the four following days, a public exhibition of photographs, which was very successful, and which, considering it was a first attempt, was distinctly creditable to its organisers. The Exhibition was held in the concert hall of the Institute building in Buckingham Palace-road, which is well suited for the purpose.

In addition to the competitive exhibits, which were confined to members of the Institute and friends introduced by them, there was an admirable loan collection, to which, amongst others, Messrs. Edgar G. Lee, Wilson Noble, W. Thomas, B. Gay Wilkinson, the Rev. F. Basil Wood, Count von Gloeden, and the Hon. Secretary (Mr. A. J. Daniels) contributed.

The Judges of the competitive classes were Messrs. Johnson and A. Mackie, F.R.P.S. These awards were: Class I. (Landscape, with or without figures).—Silver medal, W. J. Hensler; bronze, E. W. Burch. Class II. (Architecture).—Silver, R. Horton; bronze, withheld. Class III. (Portraiture and Figure studies).—Silver, R. H. Cust; bronze, J. A. Rooth. Class IV. (Hand-camera work and moving objects).—Silver, Ernest Smith; bronze, J. G. Nicholson. Special silver medal to members only: C. A. Phillips.

On each evening there was a lecture, illustrated by lantern slides, the lecturers being Rev. A. Fairbanks, M.A., Mr. J. Harris, of Cardiff, the Rev. J. Stores, vicar of the parish, Mr. E. Dockree and Mr. A. Anderson.

Our Editorial Table.

DIE CHROMO-LITHOGRAPHIE.

By Dr. FRIEDRICH HEGEL. Wilhelm Knapp, Halle a/s.

WE have received the complete volume of this work, the first part of which we reviewed in our columns on April 17 last. It amply fulfils the high expectations we had formed, and we have no doubt it will be valued as a guide and reference book by those interested in this branch of work. The book is divided into two parts, the first dealing with chromo-lithography, and the second to photographic processes combined with chromo-lithography. The book contains fifteen specimens of work and a large number of illustrations in the text.

PHOTOGRAPHISCHER ALMANACH FÜR DAS JAHR 1897.

ED. LIESEGANG, Düsseldorf.

THIS excellent little volume will, doubtless, be welcomed by German photographers. It has a pathetic interest this year, in that it contains as frontispiece a photogravure portrait of the late Dr. Paul Ed. Liesegang, whose memory will remain green in the minds of all persons interested in the scientific aspect of photography. The book contains an interesting historical photographic calendar, a large number of original articles on various subjects connected with photography, a collection of formulæ, and a list of all the German and Austrian photographic societies. We trust the book will have the large circulation it merits.

A GUIDE TO MODERN PHOTOGRAPHY.

By HAROLD BAKER. London: Iliffe & Son.

MR. HAROLD BAKER is one of the ablest photographers that we have, and therefore possesses the best qualification for undertaking the task of imparting photographic knowledge to others. The most ambitious and least satisfactory feature of the little volume before us is its title, which, we think, is not new, and, even if it were, is too comprehensive. Mr. Baker addresses beginners, in the course of about 100 pages, and has compiled a really excellent elementary handbook, with scarcely a superfluous word. Theory has been eschewed, and the result is a useful, practical guide, by which the neophyte can hardly fail to profit.

INDUCTION COILS AND COIL-MAKING.

By F. C. ALLSOP. E. & F. N. Spon, 125, Strand.

MR. ALLSOP is an old contributor to our excellent contemporary, *The English Mechanic*, from the pages of which much of the matter in the present volume has been, admittedly, taken by the author. The result is an excellent work—clear, practical, and complete. The principal chapters deal with the construction of coils generally; shock and medical coils; accessory appliances for and the application of medical coils: spark coils; batteries, &c. A brief chapter is devoted to X-ray photography. The work, which appears at a time when, by reason of Röntgen's discovery, added zest has been given to experiments with spark coils, has over 120 illustrations, and has our best recommendation.

News and Notes.

WE regret to announce that Mr. T. C. Turner, photographer, of Barnsbury-park, died on the 13th inst., aged fifty-seven.

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, Tuesday, November 24 at 12, Hanover-square, at eight p.m. *A Photographic Museum*, by R. Child Bayley.

THE AUSTIN-EDWARDS' MONTHLY FILM-NEGATIVE COMPETITION.—The prize camera for the current month has been awarded to Miss Mabel Metcalfe, Beccles, Suffolk, for her negative, *A Norfolk Lane*.

THE European Blair Camera Company, of 9, Southampton-street, Holborn, inform us that they have purchased the business of the Premier Dry Plate Company, of Notting-hill, and will in future manufacture the lantern plates and other specialities of that Company.

HACKNEY PHOTOGRAPHIC SOCIETY'S EXHIBITION.—The Seventh Annual Exhibition of the Hackney Photographic Society was opened on Tuesday evening, November 17, by the Rector of Hackney, the Rev. F. Evelyn Gardiner, M.A. A full report of the Exhibition will appear in our next.

A HAMBURG young man has just had his sanity proved by the Röntgen rays. He declared ten years ago that he had a bullet in his head, which he had fired into it in trying to commit suicide. He complained of the pain, and, as he attacked his keepers, and the doctors could find no trace of a wound, was locked up as a dangerous lunatic. The Röntgen rays have now shown the exact place of the bullet.

PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock, on Wednesday evening, November 25, Third Travellers' Night. Mr. H. I. N. Noel-Cox will lecture upon *Pompeii*, with lantern illustrations. Visitors are welcome.

MESSRS. SAMPSON LOW & CO. are bringing out a new book by Captain Abney, C.B., D.C.L., F.R.S., entitled, *Evening Talks at the Camera Club on the Action of Light in Photography*, which is included in the series of "Handbooks for Photographers," published by them. The work has upwards of sixty illustrations and diagrams.

UP to the end of October of the present year, the applications for Letters Patent numbered 24,380, an increase of 3762 over the corresponding period of last year. At this rate the total for 1896 will be about 29,250, the highest number yet attained. In 1895, however, there was a decrease of 321 as compared with the 25,386 of 1894; consequently the present rate of increase should not be considered as normal. As about fifty per cent. only of the applications are sealed, we may expect that 14,625 Letters Patent will be granted this year.

THE CENTENNIAL OF GAS LIGHTING.—The one hundredth anniversary of lighting by gas occurred in July. The first practical trial was made by Murdoch, in Birmingham, England, in July, 1796. It failed, however, to attract attention, and the next attempt was not made until 1802, when several buildings in Birmingham were illuminated with gas upon the receipt of the news of the Peace of Amiens. Gas was introduced in London as late as 1807. Murdoch, although not the inventor of illuminating gas, did much to secure its introduction.—*Elektrotechnische Rundschau.*

THE Second Annual Exhibition of the Borough Polytechnic Photographic Society will be held at the Borough Polytechnic Institute, on Tuesday, Wednesday, Thursday, Friday, and Saturday, December 29, 30, 31, and January 1 and 2 next. There will be competitions with open classes for both prints and slides, and one silver and two bronze medals will be given in each class. Entries will close on December 12. Judges: Lieut.-Colonel J. Gale, Mr. John A. Hodges, F.R.P.S., and Mr. E. J. Wall, F.R.P.S. The apparatus section will be under the management of the Prosser-Roberts Company, who will also give demonstrations of radiography during the evenings. In addition to lantern entertainments, &c., there will also be three distinct exhibitions of the animated photographs each evening. Entry forms are now ready. Hon. Secretary, P. C. Cornford, 103, Borough-road, London, S.E.

DULWICH PHOTOGRAPHIC SOCIETY.—The First Annual Exhibition of this Society was inaugurated by Mr. J. Albert Causton, at the Constitutional Hall, East Dulwich Grove, S.E., on Thursday, November 12. The Society is yet small in numbers, but the enthusiasm displayed by them, both in the quality and quantity of their exhibits, augurs well for its future. There were five classes restricted to members, and one open class. Altogether there were over two hundred pictures on the walls, principally in gelatino-chloride, carbon, and platinotype, and eight sets of lantern slides were shown. Mr. F. W. Edwards, F.R.P.S., was the Judge, and medals were awarded to the Hon. Secretary, Mr. H. J. Ellis (2), Mr. H. C. Jackson, and Mr. T. Mitchell; and, in the Open Class, Mr. E. Spencer. Certificates were also awarded to Mr. C. H. Hauff, Mr. H. A. Blake, and Mr. F. F. Thomas (2). The Exhibition was enlivened by music at intervals.

PROFESSORS H. B. DIXON and H. Brereton Baker have investigated the influence of Röntgen rays on some chemical actions, but from their note, published in the *Transactions of the Chemical Society*, it appears that the results have hitherto been negative. The effect was tried on mixtures of carbon monoxide and oxygen (dried and moist), hydrogen and oxygen, carbon monoxide and chlorine, hydrogen and chlorine and, lastly, hydrogen sulphide and sulphur dioxide (dried). No combination, either explosive or gradual, occurred between the gases exposed. The combination of chlorine with carbon monoxide and with hydrogen is effected by light, but the addition of Röntgen rays did not alter the rate of combination. Although the rays cause electric discharge from metallic bodies, they appear to have no effect on electrolysis. The action on a photographic plate is probably caused either directly or by the fluorescence of the film. It is not due to fluorescence of the glass, because the deposit of silver takes place entirely on the side of the film exposed to the rays.

HEAT-RESISTING QUALITIES OF WIRED GLASS.—A recent issue of the *Journal of the Franklin Institute* gives particulars of some tests recently made to determine the fire-resisting qualities of wired glass, *i.e.*, glass containing in its texture woven wire netting as manufactured by the Mississippi Glass Company, of St. Louis. The information is given in a report to the Philadelphia Fire Underwriters' Association, and the results of the trials showed that glass of this kind is capable of withstanding a high temperature, very much higher than ordinary glass, without melting or losing its continuity, even when suddenly drenched in a heated state in cold water. The conclusions drawn from the tests, and given in the report, are as follows:—1. Wired glass can safely be used in skylights, and in such situations will stand a severe fire, and not give way when water is thrown on it. A wooden framing for skylight, covered with tin, all seams lock-jointed and concealed-nailed, is superior, in fire-resisting quality to iron framing. 2. Wired glass in wooden sash, covered with tin, all seams lock-jointed and concealed-nailed, can safely be used for windows toward an external exposure. 3. Wired glass can safely be used in fire doors to elevator shafts and stairway towers, where it is necessary to light said shafts. 4. In office buildings, hotels, &c., where it is undesirable to have elevator shafts entirely enclosed and dark, wired glass permanently built into a brick or terra-cotta shaft, or arranged in a wood metal-covered frame, can safely be used. 5. Wired glass plates, securely fastened in standard fire shutters, can safely be used towards an external exposure. In this case, the fact that a possible fire in a building, all windows of which are protected by fire shutters, can much more readily be detected from the outside through the wired glass, is of importance. The capability of the wired glass to withstand a temperature beyond the melting point of glass appears to be attributable to the fact that the network of wire in the glass acts as a good conductor of heat; and thereby prevents the accumulation of sufficient heat to melt the glass; and, although it may thereby be softened and rendered pliable, the network of wire prevents the glass from giving way by reason of its own weight when softened by the heat.

IMPROVING NEGATIVES.—Non-chemical methods of improving negatives are strongly advocated by some, and there is much to be said in their favour, the chief point being perhaps that the film is not tampered with; this, indeed, is desirable, especially if the negative be a valuable one. The simplest and most effective method is by means of tissue paper and ordinary household blacklead. These tools, I believe, may be found in every household. Cut a piece of fine tissue paper (the coarse quality does not serve so well, as the grain prints through) the size of the negative, and damp it and stick it lightly by the edges to the glass side of the negative; the previous damping causes it to dry as tight as the proverbial drum. When dry, it may be worked upon with blacklead by a stump or the finger tip. The sky may perhaps print too dark; if so, rub the blacklead over the sky portion where it is intended to print lighter. At frequent intervals in the sky, extra dabs may be put in the form of clouds; these, if skilfully done, show up very effectively in the finished print. In fact, any part of the negative that prints too dark may be held back by working over the desired part with the blacklead or a blue pencil. The latter is exceedingly handy, especially if in a group the faces print too dark; the same can be regulated to a nicety if the tissue paper is carefully marked with the pencil. A simple method of blocking out a thin sky is to hold the negative glass-side down over the smoke from a burning piece of camphor. A piece, the size of a small nut, will send forth volumes of black, soot-forming smoke. The glass will soon become black, when the surplus upon the landscape portion may be wiped away with a soft rag. Great care in afterwards handling the negative is necessary, as the blocking is very fragile and easily damaged. If a permanent blocking out is desired, black varnish or an opaque (red or yellow) water or oil colour may be used. Negatives that contain a large expanse of sky can be quickly done by going round the fine parts on the film side to a depth of, say, a quarter of an inch, with a fine camel's-hair brush charged with thick vermilion water colour, and then pasting on the glass side a piece of non-actinic paper which will cover the paint on the film; this, of course, can be ascertained by looking through the negative.—RICHARD PENLAKE in *Photographic Scraps.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
23	Bradford	*The Art Side.* P. E. Newstead.
23	Camera Club	Cresco Film. A. Hill.
23	North Middlesex	*Home Preparation of Rough Bromide Paper.* S. H. Fry, F.R.P.S.
23	Oxford Camera Club	Lecture: *Intensification and Reduction.*
24	Richmond	*Multiple-coated Plates.* J. T. Sandell.
23	Stafford Y.M.C.A.	Failures and Abnormal Appearances.
24	Ashton-under-Lyne	*The Enlargement of Negatives, Illustrated by Pictures of Nature as I have seen it.* Thomas Glazebrook.
24	Hackney	Open Night.
24	Halifax Camera Club	*Reminiscences.* J. I. Learoyd.
24	Nottingham	Lecture: *A Peep Behind the Scenes of Popular Journalism.*
24	Rotherham	General Meeting to Consider Photographic Survey Scheme.
24	Royal Photographic Society	*A Photographic Museum.* R. Child Bayley.
25	Borough Polytechnic	*Practical Pictorial Photography.* A. Horsley Hinton.
25	Camera Club	Testing Lantern Slides.
25	Croydon Camera Club	Photographic Chat.
25	Croydon Microscopical	Annual Soirée, Exhibition of Photographs, Lantern Slides, &c.
25	Leeds Camera Club	*Architectural Photography.* H. W. Bennett.
25	Leytonstone	Practical Demonstration on Acetylene Gas. Acetylene Gas Company.
25	Photographic Club	*Pompeii.* H. L. N. Noel-Cox.
25	Southport	*Enlarging.* J. A. Hodges, F.R.P.S.
25	Woolwich Photo. Society	*The Theory and Practice of Art Photography.*—III. F. C. Lambert, M.A.
26	Birmingham Photo. Society	Members' Lantern Evening.
26	Camera Club	*Dalmatia.* W. Law Bros.
26	Ireland	*Views on the Rhine, in Switzerland, and in the Austrian Tyrol.* R. M. Inglis.—Demonstration on the Making of Lantern Slides. J. A. C. Ruthven.
26	London and Provincial	Open Night.
26	Oldham	*Rambles in Norway.* J. Ingham Learoyd.
26	West Surrey	Discussion: *The Autumn Shows.*
27	Plymouth	*Pictures and Picture making.* Aver Duncan.
28	Borough Polytechnic	*Carbon Printing.* Demonstration by the Autotype Company.

ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 17,—Photo-mechanical Meeting,—Mr. W. Gamble in the chair.

COLLOTYPE TILES.

Mr. SNOWDEN WARD exhibited specimens of collotype printing on tiles, the work of Mr. G. H. Grundy, of Derby, produced by making four or five printings in immediate succession from a collotype plate. He said there had been

in the past some difficulty in getting a really satisfactory and economical method of working vitrified enamels by photo-mechanical means, and, in order to achieve good results, Mr. Grundy carefully selected a "biscuit" sufficiently porous to take up the grease of the ink, and leave it immediately in a condition to receive another printing, the ink being composed of ceramic colour in a vehicle.

Successful Half-tone Illustration.

Mr. Eddinoton read a paper with the above title, prefacing it with some remarks upon a statement in a photographic contemporary to the effect that in the photographic, and also in the drawn, illustrations of the popular magazines "the pictorial quality of the pictures seems to be a matter of small importance; so long as the cuts are there, the demand is satisfied." He said this was a sentiment to which he—and, he thought, his audience also—strongly objected, because the state of things indicated was the very opposite of what they would wish to be the case. It was an extremely low level on which to place the pictorial work of the present day, and if it could not be raised above that level it had better be thrown over altogether. Proceeding with his paper, he said that the prevailing second-rate quality of English half-tone work was due to failure in three important points: first, the total lack of cohesion or mutual co-operation between the allied trades; second, the fact that process workers had not a clear idea of what they were aiming at, each having his little ideal without realising that substantial success could only be secured by striving to attain a common end; and, finally, a lack of enthusiasm—ambition was generally a negative quality, and men were content so long as the week's work produced a week's pay. All this must be changed before successful half-tone illustration could become the rule rather than the exception. The first step towards improvement must be to awaken slumbering ambition, and then the standard must be set up of a high ideal; process workers must be artists, and must aim at reproductions which should have all the qualities of works of art. It was by no means sufficient to suppose that a good photograph must be a good picture. For illustrative work, either much of the photograph must be taken out of focus, or the negative must be treated in some way to destroy offending detail, and he noticed with pleasure that this principle was practised by some photographers. A picture was an attempt to represent an impression, and, unless it made clear what that impression was, it failed as a work of art. Many instances of failure in the production of good blocks might be directly attributed to the lack of understanding between engraver and printer, and it would be easy to effect improvement by mutual co-operation.

Mr. Snowden Ward thought that, for artistic work, it was necessary to set one's face against art papers, and to endeavour to perfect the super-calendered paper.

Mr. T. Bolas drew attention to a very good print from a Pretsch block, issued as a supplement to the Society's *Journal* for November 15, 1860.

Mr. F. W. Jackson thought that, as leading photographers produced their best results on matt-surfaced paper, an effort should be made to get blocks which would print on a similar paper.

The Chairman said it would probably be impossible to print on rough paper so long as screens were use in making the blocks.

Mr. Bolas pointed out that smooth paper was not necessary for Pretsch blocks.

The Assistant-Secretary (Mr. R. Child Bayley) thought the Society was much indebted to Mr. Eddington and others, who called attention to rash statements made in various publications, and pointed out their inaccuracies. With reference to the passage quoted by the author of the paper from a photographic periodical, he suggested that it would have been strikingly accurate if, instead of referring to quality of illustrations, it had referred to the quality of the letterpress in some photographic publications.

The Chairman suggested that advantage might accrue from working experimentally at some of the old processes, such as that of Pretsch, and that it might be possible, by their aid, to produce results in advance of the work of the present day. The printer had to contend with a very grave difficulty, owing to the variation of inks and papers supposed to be identical; as to paper, a white glazed paper was an absolute necessity. Striving after an ideal was an excellent thing, but did not always pay, though if the public could be brought to believe that the best work was the cheapest, and to pay for it accordingly, it would be all the better for the process worker and the printer. He thought it was distinctly outside the province of the process worker to tamper with originals for the purpose of eliminating excessive sharpness or aggressive detail, and, indeed, artists and photographers would probably strongly object to the adoption of such a course.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

November 12,—Mr. E. J. Wall in the chair.

Mr. A. Haddon read a paper entitled,

A Criticism on the Theory of Development as Advanced by Mr. Banks.

Considerable interest was evinced in the various arguments introduced by Mr. Haddon, and a lengthy discussion followed, in which

Mr. T. E. H. Bullen, referring to a print by Warnerke's wash-out process, produced and shown by Mr. Haddon, said he he had been unsuccessful in his attempts to get a print on the occasion of his recent paper. Warnerke distinctly said in his instructions that, with over-exposure, your image would be insoluble, while, with under-exposure, it would wash away, and this was his experience. According to Warnerke, the amount of exposure to light was decidedly a factor in the degree of solubility of the gelatine.

Mr. C. H. Bothamley dealt at some length with Mr. Haddon's paper, in which he thought there was more than one loop-hole by which he could be attacked. He agreed with Mr. Haddon as to what probably went on during the reduction of the exposed silver bromide. Regarding the formation of the sub-salts of silver, Mr. Banks, he understood, had said the sub-bromide had only been prepared by Guntz, but that was not in accordance with the facts, amongst others concerned in the production of these sub-salts being Otto Wiener, by the Guntz method, and several others. As to the action of bromine on gelatine, this could be easily seen for oneself by taking a solution of gelatine and dropping in bromine, when an insoluble precipitate would be formed. There was good reason to suppose that the gelatine of the present time was of a different composition or nature to that with which experimenters of years ago had to deal, and this might account for differences in the observations to be found. At any rate, we know it was prepared differently then to now. With reference to the electrical theory of development, and the many other effects similarly explained, he thought it was generally the case that, when an experimenter came to a problem which he could not understand, he ascribed it to electrical action. But so doing did not solve the problem, and only styled the action by a new name.

Mr. R. Child Bayley said that, in speaking of the effect of exposure on the sensitive plate, Mr. Haddon had stated that what holds good for a short exposure should also hold good for a long exposure. But we know this is not the case. We know that the effect of a long exposure, if it be long enough, is diametrically opposite to that of a short exposure. The final result is totally different. He mentioned, in connexion with the action of bromine on gelatine, that it was well known to be impossible to recover the gelatine itself after such a chemical combination, a compound being obtained which was more or less soluble than pure gelatine. A point which bore out Mr. Banks's theory was that, so far as he was aware, it was absolutely impossible to so expose a dry plate that the whole of the bromide shall be in a developable condition, some portion of the bromide invariably remaining in an undevelopable state. To him an electrical theory had a great fascination.

Mr. Haddon, replying, said he was glad Mr. Bothamley supported his theory as to the sub-salts of silver. He thoroughly believed that bromine combined with gelatine, and for this reason, that bromide of silver was much more sensitive in gelatine than in collodion, where there was nothing to combine with the bromine. In reply to Mr. Bayley he said, if he knew how to treat plates before exposure, he could avoid reversal, and he hoped to show how to so treat plates with this view.

PHOTOGRAPHIC CLUB.

November 11,—Mr. Crofton in the chair.

Mr. Donald F. Burrage was elected a member of the Club.

Attention was drawn to the statements in The British Journal of Photography regarding the attitude of the insurance companies towards acetylene gas.

Mr. Crofton pointed out that, in case of an infringement of the conditions of a policy, the insurance became void. The only safe way to renew the insurance was to give up the old policy of insurance and take out a fresh one. In law a policy once voided was always voided.

The Secretary having pointed out that the last meeting had inadvertently omitted to thank the Auditors for their services, Mr. Fry proposed that the thanks of the Club be accorded to Messrs. Bedding and Carter, and this was carried unanimously.

A selection of slides, comprising views of Continental and English scenery, was passed through the lantern by Mr. Welford.

Croydon Camera Club.—November 11.—A public lantern show, held at the Braithwaite Hall, drew a densely crowded audience. The first part consisted of some refined "gleanings" from the collection of Mr. Edwin Dockree, who explained his very varied slides with many curious and "informative" remarks, following which were a number of snap-shots representing incidents connected with the royal visit to Croydon on May 19, when H.R.H. the Prince of Wales opened our stately Town Hall. The slides, picturing the above memorable series of ceremonies—which were entirely the work of members of the Club—numbered about one hundred, and were most of them commendable examples of photography applied to recording fleeting incidents. First were shown the decorated streets, being mostly views taken in early morning, before the crowds were about. When naming the above, Mr. Hector Maclean evoked quite a little storm of applause by exclaiming, *apropos* the Whitgift Hospital, "May it never be removed to fill the greedy coffers of the Trustees." Following the above were a series picturing the procession, many of these "bringing down the house," special favour being bestowed on "the brightest carriage-load of all," depicting the Misses Eldridge. Chief enthusiasm was, however, reserved for the portrait of Mr. Alderman F. T. Eldridge, who could not but feel gratified by the unmistakable esteem and regard in which he was held by the audience. Some street-scene incidents concluded the snap-shots, which were followed by a truly admirable collection of slides, picturing the interior of the new municipal buildings. To particularise is hardly possible, but we may remark upon the well-photographed reproductions of Mr. Roscoe Mullin's sculptured panels, the interior views of the Braithwaite Reading Hall, the grand staircase, the council chamber (all by Mr. G. W. Jenkins), and the interesting record of "the machinery which orders our moments," viz., the clockwork which drives the hands of the great clock (by Mr. A. E. Isaac). The foregoing series of slides were by the following members:—Messrs. Victor Bender (Bender & Co.), Maclean, Whiteman, H. E. Holland, A. Jenkins, J. Noaks, A. J. Noaks, Watson, Rogers, G. Corden, Kough, Costar, Underhill, and G. W. Jenkins, of whom the last two were the largest contributors, Mr. Underhill's snap-shots being very well received, and Mr. G. W. Jenkins's interiors and snap-shots being both greatly admired. Another whose work stood well out for both quantity and quality was Mr. H. E. Holland, the ever-energetic Hon. Secretary.

Leytonstone Camera Club.—November 11, Dr. Turner in the chair.—Mr. F. W. Watts gave a demonstration on

Lantern-slide Making.

After showing the methods of obtaining various tones by means of exposure and development, a most interesting method of putting in skies by means of the

ferricyanide reducer was shown. Having exposed a variety of foreground, and likewise sky negatives, he next proceeded, by taking the slides out of the washing water, and, obtaining suitably lit clouds for his various foregrounds, placed the back to back films outward, and with various strengths of the reducer gradually painted away that which was not required, and blending them together while still wet, and, when dry and film to film, a most satisfactory result had been obtained. After answering a volley of questions upon the subject, a most interesting and instructive evening was brought to a close.

North Middlesex Photographic Society.—November 16, Mr. H. Smith in the chair.—Mr. CHILD BAYLEY gave a lecture entitled

CHEMICAL SYMBOLS.

He described what constituted the molecular weight and the atomic weight, and the value of the elements, illustrating his remarks by diagrams and formulæ on a blackboard. He showed that chemical symbols meant a great deal more than was apparent at first sight, namely, that H_2O meant that hydrogen was combined with oxygen in the proportion of one to eight, as the atomic weight of hydrogen was one, and that of oxygen sixteen; also that oxygen was divalent and required two atoms of hydrogen to satisfy it. He also explained the difference between ferrous and ferric salts. In the first, iron was divalent, and in the latter quadrivalent, producing salts totally different in their effects. Mr. Child Bayley, at the conclusion of the lecture, presented to the library a volume of *The New Chemistry*, one of the "International Scientific Series." A hearty vote of thanks to the lecturer concluded the meeting.

Hastings and St. Leonards Photographic Society.—November 13.—The members and friends spent an enjoyable evening in seeing and criticising some prize slides. There were over one hundred, and some of them, particularly amongst the Architecture and Figure classes, showed considerable merit. Dr. Gray, the President, announced the titles, the lantern being worked by Mr. A. Brooker, the Secretary. At the next meeting (December 7) the late President, and former M.P. for Hastings, Mr. Wilson Noble, will give a lecture and demonstration *On the Röntgen-ray Photography*, for specimens of which he has just been awarded the medal of the Royal Photographic Society. The general public will be admitted, and the proceeds given to local charities.

Newcastle-on-Tyne and Northern Counties' Photographic Association.—At the Ordinary Monthly Meeting of this Association, held on November 10 in the meeting room in the Art Gallery, Mr. JOHN WATSON read a paper on

ACETYLENE—THE NEW GAS [see page 746].

illustrated by a demonstration of the use of acetylene in the lantern. There was a good attendance of members and friends. In his very practical and interesting remarks, the lecturer considered this light very suitable for professional men who, using a portrait lens, got a fully exposed plate at any time, no matter what the atmospheric conditions might be, with an exposure of about four seconds. He contended that in the very near future acetylene gas will be largely used for the purpose of lantern illumination. The light, which at the present time is largely used, is intensely white, in burning it has no smell, is absolutely safe, and, if not as good as the lime light, is very nearly so, and when once lit up it requires no attention. He claimed for the light great advantages. It gives no carbonic oxide, and frames and decorations in a room are not affected by it. It is steady, nearly smokeless, and well diffused—practically the same as sunlight. Mr. Watson gave many interesting and scientific facts in connexion with the new gas, and stated that, if accidents had occurred with it, it had been whilst experimenting with the gas, and not whilst using it in such a generator as he had used that night, viz., a Thorn & Hoddle's Incanto. During the discussion which followed, several members expressed a desire to see the brass fittings of the generator replaced by steel.

Oxford Camera Club.—The Third Annual Exhibition of members' work was held in the Holywell Music-room on Thursday, November 12, from two till ten p.m. There were 189 entries for competition, certificates being given for the first, second, and commended pictures in the several classes. Mr. Bedding, Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, kindly acted as Judge. Besides the competition prints were others of special interest lent by members. There were also two stalls of apparatus, one dealing mainly with the purely photographic side, the other being largely devoted to novelties in lanterns and their accessories. The acetylene light was shown in operation, and from time to time the X rays were exhibited, the members attending showing that these have not yet lost their interest. At eight p.m. there was an exhibition of the lantern slides sent in, and the report of the Judge and his awards were read. The meeting closed with a hearty vote of thanks to Mr. Bedding for acting as Judge, and to the ladies who had devoted their time to the decoration of the room.

Wakefield Photographic Society.—November 13.—The Hon. Secretary showed a series of negatives on the Wellington negative paper, together with prints and lantern slides from same. The absence of grain and freedom from halation especially shown in the church interior, with the east window of clear glass, were much commented upon. The HON. SECRETARY then gave a lecture on

ENLARGING,

first dealing with making enlarged negatives for carbon or other printing methods; he then proceeded to describe direct enlarging upon bromide paper, winding up by making two 15×12 enlargements upon Wellington paper, developing with amidol.

FORTHCOMING EXHIBITIONS.

1896.	
Nov. 20	Hackney Photographic Society. W. F. Fenton-Jones, 12, King Edward Road, Hackney.
,, 26, 27	Romford and District Photographic Society. A. John Ormiston, 4, Laurie-square, Romford.
,, 30-Dec. 1, 2 ...	North Middlesex Photographic Society.
December 3, 4.....	Aintree Photographic Society. E. P. Heron, 2 Tilney-street, Orrell Park, Aintree, Liverpool.
,, 29-Jan. 2.	Borough Polytechnic Photographic Society. P. C. Cornford, 103, Borough-road, S.E.
Dec. 1896-Jan. 1897	Bristol International. Hon. Secretary, 20, Berkeley-square Clifton, Bristol.
1897.	
January 14, 15	Weymouth and District Camera Club. E. C. Bennett, 10, Newberry-terrace, Weymouth.

Patent News.

THE following applications for Patents were made between November 4 and November 11, 1896:—

HAND CAMERAS.—No. 24,394. "Improvements relating to Photographic Hand Cameras." C. E. PECZENIK.

LENSES.—No. 24,449. "Improvements in the Construction of Great Lenses." J. SAWARD.

IMPROVEMENTS IN PHOTOGRAPHY.—No. 24,555. "Improvements in and connected with Photography." J. EWING and T. R. WATSON.

TRIPODS.—No. 24,684. "Improvements in or connected with Stands or Tripods for Photographic and Measuring Instruments and the like." A. HESEKIEL.

ARC LAMP.—No. 24,685. "An Electric Arc Lamp or Regulator for Magic Lanterns, Search Lights, or Theatrical Purposes." J. BONN.

FILM SEPARATING.—No. 24,722. "Improvements in or connected with Film Separating Devices for Use in Magazine Cameras." A. C. EDWARDS.

CENTERING TRAY.—No. 24,749. "Improved Centering Tray for Optical Lanterns." A. G. SMITH.

CHROMO-PHOTOGRAPHY.—No. 24,817. "Chromo-photography." C. C. BALSTON.

KINETOSCOPY.—No. 24,842. "Improvements in Apparatus for Rapidly Exposing Sensitised Films or Projecting Views." R. J. APPLETON.

PAINTING PHOTOGRAPHS.—No. 24,932. "Method of Preparing Photographs for Painting in Colours." Complete specification. A. E. DUNN.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

AMMONIA IN EMULSION.

To the EDITORS.

GENTLEMEN,—In the JOURNAL of the 6th, there is a paragraph seeking information of the date when ammonia was first used in the manufacture of bromide emulsion. I presume that some one is writing up the history of the matter and is anxious to fix the date.

From the fact of there being no response in the succeeding number, I am induced to mention an incident bearing on the case. When I was associated with Maudsley in 1880, a great number of the plates sent out were returned giving red fog. I mentioned the circumstance to Mr. Henderson, and he informed me that he was experimenting with ammonia, and he felt sanguine that it would prove a remedy. Whether the idea was original I am unable to say.—I am, yours, &c. F. YORK.

67, *Lancaster-road North Kensington W. November* 16, 1896,

TONING GELATINO-CHLORIDE PRINTS.

To the EDITORS.

GENTLEMEN,—A few week ago the audacious operator boasted that he knew a formula to tone gelatino-chloride paper quicker than the old albumen paper, but he did not give the method. I know plenty of printers would like to know a reliable way of toning. As a rule, the combined bath is looked upon suspiciously, and the sulpho bath is not much better and too expensive. The following toning formula I have used for upwards of three years with success:—

Wash the prints in one or two changes of water, then tone ten minutes in solution:

Formalin	1 drachm.
Water...	8 ounces.

Wash again in one or two changes of water.

The formalin does not interfere in the least with the toning.

Tone in the following bath:—

B.	2 ounces.
U.	½ ounce.
St.	½ ,,
G.	1 ,,

This solution is to be made up one quarter of an hour before using it in the named rotation, shaking well after each addition.

St. can be omitted in the winter time, or if the paper is fresh, as it does not interfere with the tone.

Make the bath up for the whole amount of sheets to be toned.

The prints will turn in this bath orange-red, and even appear stronger, then return to the original strength, and, if the high lights look clean, and the colour is about like a finished albumen print, the toning is finished. Time required, about two or three minutes; even quicker if your paper is in good condition. Don't attempt to tone bluish, or your print will be over-toned, and appear dirty yellowish. Move the prints well in the toning bath, and rinse well after, or stained prints will result. Judge the tone from the surface, and not by transparency, as the uranium gives you ample range of colour. If that change to red does not take place with your paper, don't use your bath or change your paper. One grain of gold to the sheet is required, not more.

Stock Solutions.

B.

Borax	4 ounces.
Water (ordinary)	80 ,,

Dissolve hot, but use cold.

U.

Nitrate of uranium (in sealed tube)	1 ounce.
Water (distilled)	35 ounces.
Nitric Acid	½ ounce.

Keep in the dark, and don't expose to the light.

St.

Nitrate of strontium	1 ounce.
Water (ordinary)	30 ounces.

G.

Chloride of gold	15 grains.
Water	15 ounces.

If this way of toning is of value to my fellow-workers, I shall be pleased.—I am, yours, &c., OTTO PFENNINGER.

MORE SALON-IC ETHICS.

To the EDITORS.

GENTLEMEN,—Mr. Maskell's reply is as disingenuous as I expected. He says I have transferred my correspondence from himself to you, but he does not say why, viz., because it was impossible to extract a reasonable reply from him, and, after the letter quoted last week, impossible to get one of any sort from him, though I gave him due notice that I should write to yourselves if he refused to reply.

Mr. Maskell says it is not a fact that I have ever been invited to exhibit at the Salon. May I ask you, sir, what interpretation you would put on the unasked receipt of an entry form from the Salon?

I have never asked the Salon for an entry form or for an invitation to exhibit. For the last two Exhibitions I have received, unsolicited, the ordinary entry form, and this, I take it, any ordinary person would accept as an invitation to exhibit. Will Mr. Maskell publicly state what the Salon's invitation really consists of, if not in their voluntary sending out entry forms to workers of their own selecting? (Mr. George Davison personally had the form for the first year sent me.)

Mr. Maskell says the pictures referred to were not sent by him or by his instructions: a quibble, as doubtless they were sent by Messrs. Dicksee, acting on general instructions from the Salon. If not, why are they allowed to do as they like with pictures intrusted to them? What is a Secretary for but to control this? I, of course, have no receipt from Mr. Maskell for the 2*s.* paid, but does Mr. Maskell thereby mean to imply that I am stating that which is not true when I say that sum was paid on delivery of the pictures? I shall be extremely glad for him to be quite explicit on this point. He knows that 1*s.* per picture is the fee for the return by Messrs. Dicksee of uncalled-for-pictures; then, why this further quibble?

Since writing to you I have heard from Boston, and my friend Day is puzzled and vexed. He knew he had sent two pictures, yet he has received a rejection notice for three. This shows more mistakes by Mr. Maskell or his clerk; two were rejected, not three. It also shows how much better Messrs. Dicksee read the entry forms. *He* sends the rejection forms to America, *they* send the pictures to me, both from reading the same entry form, and *I* have to pay two shillings for the mistakes, besides putting up with the Hon. Secretary's discourteous and unreasonable behaviour.

Another mistake of Mr. Maskell's. No entry form was sent to Mr. Day, though he is a member of the Linked Ring at their own invitation; he tells me he is puzzled at not receiving it, as he had some new work he wanted to send—out-door studies of the nude—but, as he knew nothing as to dates, &c., he could not send. He has since given me the two studies he intended sending, and I can assure Mr. Maskell the Salon's walls lost two charming exhibits through his carelessness in not giving his foreign members due notice and entry forms.

It is a matter of indifference to me whether Mr. Maskell replies to this or no, now I have made public his peculiar ideas as to the behaviour due from him as an Honorary Secretary, to say nothing as to that looked for from the ingenuous gentleman.

I still, however, grudge the Salon my unrighteously exacted two shillings, and shall not be satisfied until I receive it and am able to pass it over to what local poor-box they may prefer.—I am, yours, &c.,

19, *Buckingham-street, Adelphi, W.C.*, FREDERICK H. EVANS.
November 14, 1896.

PHOTOGRAPHY AND POLYTECHNICS.

To the EDITORS.

GENTLEMEN,—I have read with interest an article by Mr. John A. Randall in your issue of November 13 on the above subject, and, whilst I consider that the question of photography as taught at polytechnic institutions needs ventilating, I think some of the statements made by this particular writer are incorrect, and the deductions he draws therefrom correspondingly false. In his opinion polytechnic institutions have left their proper position by not confining the classes to actual apprentices and journeymen wishing to learn the technique and scientific principles underlying their trade. As far as I can ascertain, this is still to a great extent the case; but, if other persons, for reasons of their own, desire to enter a course of study, the polytechnic would certainly gain nothing by refusing to accept them as pupils, nor can I see that the genuine apprentice suffers in consequence. As to the question of twelve months' polytechnic instruction, or cramming, as he terms it, taking the place of several years' apprenticeship, it is hardly likely that it would be expected to do so, excepting in the case of a naturally gifted man; but that it should shorten the term of apprenticeship, and oil the wheels of practical manipulation, is both right and desirable.

He goes on to complain of his own course of instruction, and holds it up to ridicule as not being sufficiently practical. "Hardly a subject having a close relation to every-day matters was studied," he says; but is not this an erroneous view of the matter, brought about by the pupil failing to sufficiently apply the theoretical knowledge he acquired to practical use? There are some men who cannot see the application of principles; and, if, for example, an astigmatic lens should be put into their hands, and they were asked to do some copying with it, they would most likely blunder on without being able to assign the cause of failure to produce sharp results, although the faults of astigmatism had formed a part of their early instruction.

Finally, he alludes to the etiquette of the studio being impossible of acquirement at the technical school. It should hardly be necessary to teach ordinary manners at a polytechnic institution, and the particular etiquette of any one establishment ought to be acquired by any sensible youth in a day. The example Mr. Randall gives of the boy who shouted "Come on" to the lady at the door of the studio is ludicrous enough; but it gives rise to the questions, "Had the youth a mother? and, if so, why did she not teach him elementary manners before he left his home?" Neither the professional photographer nor the polytechnic institutions ought to be called upon to teach our young men common sense and common politeness.—I am, yours, &c., MATTHEW SURFACE.
Bradford, November 16, 1896.

A TECHNICAL EXHIBITION.

To the EDITORS.

GENTLEMEN,—Thanks for your article *re The Future of Photography*. It appears to me that one Exhibition with two sections, as suggested, would be better than having two Exhibitions. Those travelling from a distance would find it more convenient. Other branches of allied work should be represented; the workers would be interested and helped by the exhibits, and will pay their shillings freely to get a notch or two in their own way.

Pleasant pictures pay best; and, if photographers can be assisted by the exhibition of technically good ones to produce satisfactory ones themselves, they, too, will go and pay to see.

All praise to those who help us on in any one direction, and, if by broadening the base more co-operators could be secured, of course more funds would accrue to the Society, and the greater would be its influence and usefulness.—I am, yours, &c., W. GIRLING.
Strathbroke, November 10, 1896.

UNFAIR COMPETITION.

To the EDITORS.

GENTLEMEN,—Some great upholders of Trade Unionists, short hours, and living wage, in the London Press, have, after denouncing various firms and trades for cutting and under-selling their smaller brethren, themselves entered into competition with the photographers of London and district by advertising to supply for 6*s.* 6*d.* what they term a three-quarter life-size crayon and India-ink portrait, packed and sent, carriage paid, to any reader, and also state that they are equal to those supplied by artists at from two to four guineas. Now, all photographers know perfectly well that a photograph cannot be copied and the negative retouched, and an enlargement made and worked up in crayon

and India ink, at the price mentioned, unless one or two things happen, either the workmen are over-worked or under-paid, *possibly both*. As a slight retallation, I would suggest that all photographers and their assistants, especially those dealing with the working classes, endeavour to persuade their friends, &c., who at present do so, to discontinue taking in the papers, and any photographer who is a member of a club or institution should endeavour to get the papers removed from the reading rooms, &c., of such places, not that the loss of a few subscribers would materially hurt them, but it would at least show up the character of these great organs of *fair play* and denouncers of "black legs" and those who adopt cutting tactics in business.—Apologising for the length of this letter, I am, yours, &c.,

A LATE "STAR" READER.

To the EDITORS.

GENTLEMEN,—As your readers may be proud of having discovered the cheapest offer for *artistic* enlargements, I beg to send you herewith an advertisement as published in Paris in a halfpenny newspaper, which offers an enlargement, same as your English newspaper, for the reasonable sum of 4*s.*, instead of 6*s.* 6*d.*, as in London.

As a matter of curiosity I went to see the firm, which appeared to have opened shop for this special occasion. I was shown some pretty poor samples of enlargements, *all* framed, and having less size than that advertised, being only half life size. The price of 4*s.* was not mentioned, but I was at once shown the cheapest framed portrait, which was 12*s.*, with a beautiful 2*s.* frame around it. Upon my insisting upon the 4*s.* portrait, I was very reluctantly told that it would be made, but could only be delivered after two or three months, while the framed ones only took two or three weeks; "but we would rather furnish them framed," was added.

Now, I have not seen the advertisement as published in the English newspaper, but I would not be astonished if it were worked similar to the enclosed one, and you will see that, at first sight, it appears to be an enterprise of the newspaper, which it is not, if you read it all. The money is to be sent to the photographer at his own address, so that the newspaper has nothing to do with it, and that advertisement is exactly the same as any other one from another firm selling goods at reduced prices. It offers *to the readers of* ———, for the small amount received with the photograph to be reproduced, an enlargement, &c. So that the offer is made by the firm mentioned to the readers, and not by the editor to his subscribers, which is quite different.

But how about the photographer that offers and does the work!—I am, yours, &c.,

TREDLA.

November 14, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street. Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Frank Reynolds, 29, High-street, Bognor.—*Photograph of high sea at Bognor.*

William Blake, 74, Midland-road, Bedford.—*Photograph of Samuel Whitbread, Esq. Photograph of Lady Isabella Whitbread.*

RECEIVED.—J. W. BENNETTO; H. W. BENNETT; PHOTIQUE-ART; INQUIRY; HERBERT SWAINS; ONE IN DOUBT; R. W. WICKS; SPARTAN; ARTHUR & Co.; HENRY & Co.; H. J. BUCKLAND; GIBSON & SON. In our next.

A. MARLOW.—See the JOURNAL of August 23, 1895, in which the author of the tables has an article on the subject.

FIXING.—N. E. W. says: "I am using a saturated solution of hyposulphite of soda for fixing wet plates. Would it do to fix dry plates in the same solution?"—In reply: For dry plates six ounces to one pint is the definite strength usually employed.

HARDTMUTH'S PENCILS.—ARTIST says: "Could you inform me where I should be likely to obtain Hardtmuth's Negro pencils. I have tried Marion's, Houghton's, and one or two artists' material dealers, and have been unable to procure them. If you can help me, I shall be much obliged."—In reply: Try Messrs. Hardtmuth themselves at 12, Golden-lane, E.C.

EMPLOYMENT IN CAPETOWN.—CAPER says: "1. Is there any demand for good retouchers at Cape Colony—preferably Capetown—in high-class houses? 2. Are wages good? 3. Is there any difficulty in obtaining situations in that part?"—In reply: 1 and 2. Generally speaking, our information leads us to suppose that, for really able men, South Africa offers excellent opportunities. 3. Possibly not greater than at home.

MERCURIAL INTENSIFICATION.—G. PRESTON says: "Give me some idea as to how to proceed with intensifying with mercury and blackening with ammonia. I mean as regards quantity and method."—In reply: The negative having been well washed to free it from hypo, bleach it with a saturated solution of bichloride of mercury. Wash well, and then blacken with aqueous ammonia—say half a drachm in ten ounces.

COLOURED PHOTOGRAPHS.—A. M. says: "Can you give me the name and address of firm that executes the coloured view photographs that are now exhibited in most of the principal towns? I refer to the whole-plate views of Canterbury Cathedral, Hastings, and Cambridge views, &c. In the latter town they are sold for 1*s.*, mounted! At the back there is a remark, 'Not coloured by hand,' &c., but name is not given."—In reply: The pictures referred to are probably those produced by the Photochrom Company, whose address is 63, Ludgate-hill, London, E.C.

DAYLIGHT *versus* OIL FOR ENLARGING.—G. M. says: "I should be pleased to have opinion on following. I do a lot of enlarging on bromide paper, and have occasion to produce several from the same negative. I use daylight. Suppose I got a lantern with oil light, and using rather thin negatives to suit, would the results be as good as daylight? Assuming correct exposure in each case, would the lantern enlargement be so much inferior in quality as to be very apparent?"—In reply: We see no reason why enlargements made by artificial light should be qualitatively inferior to those made by daylight.

ALUM AND P.O.P.; INK STAINS.—S. PORTER asks: "Will you be good enough to inform me on the following two things? 1. Does the use of ordinary alum for hardening P.O.P. prints diminish the detail of such prints? 2. I have, unfortunately, let a large spot of ink drop on a bromide enlargement. Is there any means of getting it out?"—1. We have not found it do so in our own practice. 2. It is very doubtful. There are so many kinds of ink, all of which differ in their composition. If the ink be the old-fashioned kind, made with nutgalls and iron, it is possible that oxalic acid, carefully applied, will reduce, if not remove, the stain.

COLOURING PRINTS.—COLOURIST writes: "Will you kindly tell me of any books on finishing bromides in oil and water colour, and names of publishers with addresses? Water colours lay so very uneven on bromides; is there anything which would harden the film so that wet water colour would not affect it?"—There are no works published on finishing bromide pictures that we are aware of. There should be no difficulty in applying water colours to bromide prints. If the surface is found at all repellent, that may be overcome by washing over with diluted oxgall, as supplied by artists' colourmen; or by going over the paper, lightly, with an ink-eraser.

ELECTRIC LIGHT.—E. B. says: "Where can I obtain electric lamps for portraiture? Do they admit of instantaneous exposures as required in baby photography? Can you tell me any studios in London where I may see them in operation? and how many lamps are required, and the probable cost per lamp?"—In reply: Arc lamps may be obtained of Messrs. Gwynne & Co., Brooke-street, Holborn, E.C.: incandescent lamps of Messrs. Adamson & Co., of 18A, Eldon street, Finsbury, E.C. Exposures short enough for your purpose may be obtained with either system, using sufficient power. Both firms will give you full particulars as to cost, and also let you know where the lamps may be seen.

A QUESTION OF PERMANENCE.—G. ADAMS says: "If a firm offers to supply for 6*s.* 6*d.* an absolutely permanent enlargement, and then send a bromide enlargement, which is not permanent, can I safely return it and demand a permanent one, such as a carbon or platinum enlargement? The above offer, which, no doubt, you have seen, appears in the *Star* and *Morning Leader*."—In reply: You seem to suppose that a bromide enlargement is, of necessity, not "permanent." We do not agree with you any more than we should if you said that albumen prints were not permanent. Both kinds of prints, if properly prepared, will remain unaltered for many years. However, answering your question, we should say, No.

BACKING.—A. SQUIBBS says: "Will you kindly tell me the best way to photograph a stained-glass window? I must state that it will have to be done with a wide-angle lens, which I find produces far more halation than an ordinary rapid rectilinear. I have already done it, but, as I photographed it in the twilight to avoid halation, the inside of the church walls, including brass tablet close to window, is very black. I do not find backing a plate always successful; when it is so, I notice that the negative is just as good without backing. What is the best material to use for backing?"—In reply: The following backing mixture is as good as any, and, if employed in conjunction with a thickly coated plate, should yield good results: Gum solution (ordinary office gum), 1 ounce; caramel, 1 ounce; burnt sienna, ground in water, 2 ounces; mix, and add alcohol, 2 ounces. As to the halation produced more by one lens than another, we presume both lenses were not stopped down to equal apertures. Theoretically, *all* negatives are improved by backing.

TONING P.O.P.—PRINTER writes: "Will you please give me a reply to the following queries? 1. Will it be an advantage to wash P.O.P. prints, after taking out of alum, as thoroughly before toning as in the final washing? 2. Will it be a great advantage to have the prints washed after toning and before fixing with the same thoroughness also as the final washing? I have ample facility and convenience for doing both, if any advantage; the latter I am thinking of trying in any case, as we find that the P.O.P. prints do not entirely stop toning even when placed in a salt bath, and we think that they will be likely to stop if dropped as toned into a print washer in action, taking out in batches as required for fixing; and kindly make it clear whether you intend your reply to apply to silver prints as well."—In reply: 1. All that is necessary is that the alum is washed out; further washing is of no good. 2. It is not necessary, so long as the toning action is suspended. If the salt bath does not do that, the best way will be to take the prints out of the toning bath a little before they acquire the tone desired. The treatment proposed will do no harm. P.O.P.'s are silver prints. If you mean prints on albumen paper, the proposed extra washing will be harmless.

*** Several answers to correspondents unavoidable held over.

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EX CATHEDRÂ.

An order for 10,000,000 photographic prints is sufficiently large to deserve notice. Numerically the order has probably not been exceeded, and, although each individual print is to be of such dimensions as to allow of its being placed on a box containing cigarettes, the total area of sensitive surface required to be employed is obviously so great as to suggest that in this respect the order also ranks as, what it is the custom to term, a "record" one. A German photographic printing house has been intrusted with the execution of the reproductions, the gelatino-bromide paper process being adopted for the purpose.

* * *

With reference to our leaderette of last week (p. 739) stating that Herr Arthur Schwartz, of Berlin, had adopted Mr. Friese Greene's rapid bromide printing machine, Herr Schwartz informs us that this is not the case. The machinery employed by him at his photographic printing works was devised and patented several years ago. It is fully described and illustrated at p. 831 of our Almanac for 1896, and also in this Journal of August 31, 1895.

A country photographer writes, drawing attention to a report in our issue of November 13, of a serious explosion at Grimsby in using acetylene for portraiture. "It seems to us," says our correspondent, "from the report, that the gas was used as made from a generator. We are contemplating giving acetylene a trial for artificial light portraiture; but, if that sort of thing is likely to take place, we shall fight shy of it, and rather use the incandescent light. Can you," he asks, "suggest how the accident happened, and whether you think acetylene safe to take up after the accident reported?"

* * *

We give our correspondent's inquiry prominence here because it is typical of many that have reached us on the same subject. In the absence of definite information, we are unable to advance an explanation of the accident; but it has been suggested to us that the explosion may have been due to the admixture of air in explosive proportions with the acetylene, a contingency that may be averted by, so soon as or before the gas commences to generate, opening the taps and allowing the air to escape. As to our correspondent's other question, we look upon acetylene as being just as safe to use as as ordinary house gas. The accidents that have taken place abroad with the compressed gas, and the attitude of the insurance companies, in refusing to grant policies on premises where it is used as generated, have in our opinion been productive of a great deal of unnecessary alarm in reference to acetylene.

* * *

The sources from which calcium carbide can be obtained in large quantities have brought us several queries similar to the following:—"Can you tell me whether the carbide of calcium at present on the market is made in England or imported from America? I ask with the view of buying it regularly in large quantities to sell again. If you can assist me with the address of any makers you may know of, I shall esteem it a favour." The carbide is produced, we believe, both in America and Germany; but it is said that it may be purchased in large quantities of the Acetylene Illuminating Company, Foyer's Falls, Loch Ness, N.B., who, no doubt, will quote our correspondents if so desired. As to the transmission of the carbide, our article on the next page of this week's Journal will, no doubt, be read with interest by many.

* * *

We had a note last week on Motor-car day, and the unsuitability of the weather for taking photographs of the cars

on their notable journey. It will be gathered from the tone of our remarks that we did not expect to hear of many successful results. Such, indeed, has proved to be the case. However a friend, Mr. H. E. Farmer, who lives at Purley on the Brighton road, sends us a number of prints from hand-camera negatives that he took of some of the cars as they passed. All things considered, the prints are good, and, as they are certainly interesting, we shall preserve them as a memento of what will, no doubt, one day be looked upon as an historical event.

ACETYLENE AND COMPRESSED GASES BY RAIL.

A RECENT query in this connexion by a correspondent not having met with a response from any of our readers, we have been at some pains to ascertain from official sources the conditions the railway companies lay down as to the carriage of calcium carbide, acetylene, and compressed gases generally. At the outset it is very desirable that our readers should be aware that, apart from any question of carriage or exorbitant charge therefor, the railway companies are not what are termed "common carriers," that is, governed by the regulations of the well-known Carriers Act, for there is a special Railway Clauses Consolidation Act, passed in 1845, and an Explosives Act, passed in 1875, which have a special bearing on explosives and dangerous goods, and any contravention of their conditions renders senders of such goods liable to penalties of from 20*l.* to 100*l.*, according to the goods carried and the mode of transit, the heaviest penalty attaching to carriage by sea.

The first point presenting itself for consideration is as to whether any variation of charges or rules is made by one or other of the various companies. The facts in this case are that, first, as to charges, the main companies have a uniform rate of carriage for all classes of goods, particulars of which (with regard to classification only) will be found in a book of nearly two hundred pages, entitled *General Railway Classification of Goods by Merchandise Trains*. It is published annually, and at intervals between the publication of successive yearly volumes supplementary fly-sheets are issued, bearing upon new rates and classification of goods. These particulars refer to goods trains only; but it may be at once stated that no passenger train parcel is less encumbered with restrictions than goods train consignments.

Secondly, as to rules. There is this difference: Some companies decline to carry, under any circumstances, dangerous or explosive goods that are not declined by the majority of lines.

As before explained, the classes are A, B, C, 1, 2, 3, 4, 5, the first-named being the cheapest for large quantities, the last-named being the dearest.

We shall find that in the 1896 volume there is no mention of carbide of calcium; its first appearance seems to be in the fly-sheet for August of this year. It is placed in Class 3, and has no minimum charge like acids, so the rate is not expensive. It is less, for example, than the rate for ordinary chemicals or drugs packed in hampers. The chief point is the restrictions or conditions. They are as follows:—"Calcium carbide in hermetically sealed tins, packed in strong wooden cases, or in air-tight and damp-proof iron drums." "Must not be carried in closed vans, and must not be placed in the Company's enclosed sheds or warehouses." Further, there must be a consignment note sent to the railway office, declaring and describing the character of the goods sent, when any dangerous or explosive compound is sent to the *dépôt* for dispatch by rail. The goods to be so declared include compressed oxygen and hydrogen, besides others of no interest to photographers. It will thus be seen that it is a serious and punishable offence, either to send, or to omit to declare when sending, any of this class of goods by rail. Acetylene gas (compressed) does not find any place in the list so far, but there is little doubt that in the present state of public feeling the railway companies would decline to carry compressed acetylene at all.

With regard to compressed oxygen or hydrogen, they are classed as 2, and must be sent "in cylinders of wrought iron or mild steel, containing not more than 0·25 *per cent. of carbon thoroughly annealed after manufacture*, of sufficient strength, and efficiently tested, and the cylinders securely protected by one of the following descriptions of packing:—(*a*) Cylinder in closely plaited hemp or coir; (*b*) Cylinder fixed in ordinary wooden box without lid, but with rope handle; (*c*) Cylinder loose in ordinary wooden box with lid, secured by strap; (*d*) Cylinder efficiently protected by closely woven wicker-work, the valve of the cylinder not to project beyond the wicker-work."

In sending by passenger train, all the above packing and consignment notes' conditions hold good, and calcium carbide would be treated as an explosive, like cartridges, which are not permitted to go by passenger train at all.

As our readers are aware, the prohibition (or panic) circular issued on March 1, 1895, was withdrawn, and a new one issued in its place on May 23, 1895. This latter formulates the rule still obtaining with regard to taking the gas as passengers' luggage. This is entirely forbidden, either as personal luggage taken into the compartment by the traveller, or as part of his luggage in the van. If it is taken by passenger train at all, it must go as a parcel, and be paid for as such, and not more than one cylinder in a parcel. This regulation is objected to by many; but, looking at the matter from the railway companies' point of view, it is a pertinent question to ask what the public would say if an accident again occurred through a careless traveller dropping a defective cylinder?

It will thus be seen that, in regard to the particular class of goods interesting to photographers, the conditions of carriage are neither specially onerous nor costly, but that, in the case of those companies who decline to carry at all, there might, of course, be grave inconvenience. These, however, are few in number, and we will close our remarks by an enumeration of them, remembering that the carbide would come under the head of "explosives."

The East London decline to carry all explosives, Great Eastern ditto, Metropolitan ditto, North London ditto.

The late Lord Leighton's Works.—The forthcoming winter Exhibition of the Royal Academy is to be confined exclusively to the works of its late President, Lord Leighton. The late artist's work is more familiar to the greater portion of the public through the engravings and photogravures of it than by the pictures themselves. Therefore it will be interesting to see how the colours of the originals have been translated into monochrome by the different engravers, and also by photogravure. Different engravers differ materially as to how the various colours, such as reds, greens, and blues, should be represented in monochrome, while some scientists aver that they are all more or less wrong. As all the plates, engraved and photogravure, have been approved of by the late artist before they were published, it will be interesting to many who take interest in orthochromatic photography to note his ideas on the subject.

The X Rays in Paris.—The Paris correspondent of the *Standard*, telegraphs that an examining magistrate in Paris has, for the first time, ordered the use of the X rays in a criminal case. It appears that, on the 1st instant, a pseudo-anarchist attacked two *sergants-de ville* with a revolver, and wounded one of them in the nape of the neck. The victim was taken to the Charité Hospital, but the bullet could not be extracted, though the man said he could feel the ill effects of its presence. The magistrate therefore instructed Dr. Descouts to employ the X rays in order to determine the exact position of the bullet. It is often said that "they manage things better in France," but we have an idea that in a London hospital, under similar circumstances, the doctors would not wait three weeks for a magistrate's suggestion to bring the Röntgen rays into use?

Acetylene and Fire Insurance.—Arising out of our leading article on the attitude of some of the fire insurance offices with regard to the use of acetylene by photographers, the subject has twice been brought up at the Photographic Club. At the last meeting Mr. Snowden Ward mentioned that he had been in communication with the office in which he is insured with regard to the experimental use of acetylene. As a consequence, he had been waited upon by its risk surveyor, who said that he saw no reason why his office should make any restrictions as to its use, and that he should so report. It was added, however, that his opinion must not be taken then as being formally official. The office would further communicate officially, the result of which we are unaware. If one office should see no "hazardous" risk attending the use of acetylene, there seems no reason why others should do so. It may be mentioned, however, that the office referred to has for some years past treated photographers' risks, in the matter of premiums, far more liberally than the majority of other offices do. That office is the Westminster.

Voided Policies.—*Apropos* of the above, while the subject was before the Club, a very important matter to insurers was pointed out by one of the members (Mr. E. Crofton), namely, that by infringement of any one of the conditions of a policy the insurance would become void, notwithstanding that premiums may subsequently be paid upon it. In law a policy once voided is always void. This is a matter that may not be very well known to the majority of photographers. The conditions of some policies are such that they are often infringed inadvertently in the practice of photography; but, even if the infringement is but temporary, it is quite sufficient to void the insurance. The only safe way, if the policy has been voided, is to give it up and take out a new one. We commend this subject to our readers, as some insurance offices are very prone to raise as many quibbles as they can when claims are made upon them.

Miniature Painting.—The Society of Miniature Painting, whose first Exhibition, in New Bond-street, was held last month, has had the honour of submitting to the Queen a selection of the exhibits there shown. They were also submitted to the Princess Louise (Marchioness of Lorne). The Princess is an enthusiast in art, and has become an honorary member of the Society. It looks very promising for the future of miniature painting that it is going to hold a second Exhibition so soon after the first. It is to be held in the spring of next year. If miniature painting is revived—and there seems a prospect of it being—it should tend, as we said when the Exhibition was proposed, to resuscitate coloured photographs, which, at one period, were a very profitable adjunct to the portraitist's business, and which, no doubt, sounded the knell of the "Miss La Creevy" style of miniature painting. If colouring is again made a prominent feature of in photographic portraiture, it must not be of the kind that, in the majority of cases, has passed as photographic colouring during the past decade. It requires a good miniature painter to produce a high-class coloured photograph.

One reason why, possibly, coloured photographs of the better class fell into desuetude was that they were made on a more or less unstable base—silver prints. People could not be expected to pay several guineas for a coloured picture that, in a few years, would become very materially deteriorated through the fading or yellowing of the silver base. Such conditions do not obtain now, as any of the permanent processes in vogue at the present time are admirably adapted to the requirements of the photographic colourist, and one may fairly assume that no other would be employed where highly finished work is in question, and for which a good price is paid.

The Late Solar Eclipse.—It will be remembered that ill success, through the weather, attended most of the expeditions sent to observe the eclipse of the sun in August last, particularly our own Norwegian one stationed at Vadsö. The observers, conveyed by Sir George Baden-Powell, in his yacht, the *Otaria*, to Novaya Zemlya, were, however, more fortunate. At the last meeting of the Royal Society, Sir G. Baden-Powell, and Professor Norman Lockyer, read preliminary papers—or first instalments—of the results obtained by this expedition. It appears that Mr. Shackleton, who was to make spectroscopic observations by photography, was very successful, as he secured twenty-four negatives, sixteen of which were taken during the disappearance of the photosphere, and about half a dozen during the absence of the chromosphere. The coronal ring and its spectrum has thus been represented. One of the photographs of the corona gives a capital notion of the curious aspect of the eclipsed sun. A further communication from Mr. Shackleton himself is promised, which will be looked for with interest. It will be some time yet before all the discussion on the results, short as they are, of what was expected from all the expeditions can be completed.

ALDEHYDES AND ACETONES IN THE PRESENCE OF SODIUM-SULPHITE IN DEVELOPMENT.

Under the above title, MM. Lumière Frères and Seyewetz contribute to the *Bulletin Belge*, a paper giving an account of their researches on the action of formaldehyde and acetone in the developer.

In 1889, Schwartz and Merklin pointed out in the *Photographic Archiv*, 1890, p. 124, that formaldehyde considerably augmented the reducing power of a developer. Quite recently Helheim has used formaldehyde in the pyro developer as a tanning agent, and confirms the above statement.

The authors of the paper point out that it is not the formaldehyde alone which has this action, but that the presence of sodium sulphite is essential for this accelerating action to appear, and that similar alkaline substances, such as acetate and neutral phosphate of soda, have not this power; and, on the other hand, most of the aldehydes or acetones will give the same phenomena as formaldehyde.

The aldehydes or acetones and sodium sulphite can not only accelerate development, but a latent image may be developed with these and a developing agent of the phenol series.

The explanation given by the author is that the phenol forms an alkaline phenate with the alkali of the sulphite, which is then transformed into bisulphite, which combines with the acetone or aldehyde, forming a bisulphite compound. They have proved that the acetone does not combine with the sodium sulphite, and represent what occurs as follows:—

$$2\left(\begin{matrix}CH_3\\CH_3\end{matrix}\right)CO + 2Na_2SO_3 + C_6H_4\left\langle\begin{matrix}OH\\OH\end{matrix}\right. =$$

Acetone. Sodium sulphite. Hydroquinone.

$$2NaHSO_3 + 2CH_3COCH_3 + C_6H_4\left\langle\begin{matrix}ONa\\ONa\end{matrix}\right.$$

Bisulphite and acetone. Alkaline phenate.

It is probably this liberation of the alkali which permits the phenol compound to exercise its developing power. The bisulphite compound could not be isolated.

Various formulæ were tried with hydroquinone, pyro, para-amidophenol and para-phenylendiamine, and the authors state that, although their researches are by no means finished, yet the following developer will give equally good results as when the alkaline carbonates are used:—

Hydroquinone	3 parts.
Sodium sulphite	10 „
Acetone	10 „
Water	100 „

THE THEORY OF DEVELOPMENT.

I.

THE very able and instructive paper on the above subject by Mr. A. Haddon, in last week's issue, is so full of careful argument, and at the same time so exhaustive, that there would seem scarcely anything left to be said in connexion with the points in dispute; but, as the subject is one that of late years has received very little attention, and moreover, will bear a good deal of discussion before it can be said that any really unassailable theory has been established, I venture to contribute one or two suggestions on points which I think are still open to argument.

In the first place, with regard to the tanning or indurating action of development upon the gelatine film, Mr. Banks and Mr. Haddon are at direct variance, the one maintaining that the action results from the bromine liberated during development, while the other holds that it is due entirely to the oxidised pyro solution employed. Mr. Haddon's arguments and experiments certainly go far to prove that his view is the more likely one, but I venture to think that they fail in being conclusive.

I may perhaps be permitted to refer to a letter of mine in these columns on 16th ult., to which Mr. Haddon alludes in his paper. In that letter I mentioned that Mr. Warnerke some years ago attributed this indurating action in the process, and which is so intimately associated with his name, to the "combined action of light and development." From a remark in Mr. Haddon's paper it seems to me that he wishes to pin me to the statement that the result is due to the direct action of light, which is far from my meaning, since that would involve the belief in the sensitiveness of gelatine itself to light. What I meant, and what Mr. Warnerke meant, was that the hardening action arises from the chemical reaction set up by the developing solution upon those portions of the film where the light has acted, and I go no further than claiming light as the *primary* cause, and this Mr. Haddon's own experiments now demonstrate to be true. The only question is one of detail as to how the operation is carried out.

Mr. Banks attributes the hardening to the effect of the liberated bromine, to which view Mr. Haddon takes exception, and I cannot help agreeing with him. As he says, bromine as such is never liberated during development, whatever may be the change that occurs in the silver bromide on exposure. This appears to be absolutely true, since, granting the effect of light is to form sub-bromide of silver, the bromine given off is scarcely likely to have much, if any, action in the dry state of both itself and the gelatine. On the application of the developer, the first action we must assume to be the oxidation of a portion of the pyro, and the liberation of a corresponding equivalent of hydrogen, which instantly seizes the liberated bromine, if, indeed, it be not the actual cause of its dissociation from the exposed silver bromide. Consequently the bromine is never present in the developer in the free state, nor can it be supposed that, in the presence of a large excess of alkali, the hydrobromic acid formed by its agency has more than a momentary existence. It is, of course, possible to imagine that at the moment of occlusion—that is, before the hydrogen has time to combine with it to form hydrobromic acid—the bromine in its nascent condition may act upon the gelatine with which it is in contact; but it is difficult to believe that such a result as the complete insolubleness of the film should be effected in so momentary a manner, more especially if we consider that, in all probability, it is the nascent hydrogen that forces the bromine from its combination with the silver instead of finding it loose and ready for a new combination.

Mr. Haddon makes another point, too, in saying that the acceptance of Mr. Banks's bromine theory involves the assumption that bromine or hydrobromic acid has a stronger affinity for the gelatine than for the free alkali of the developer, an assumption in every way difficult to reconcile with facts.

Mr. Haddon's view is that the result is due to the tanning action of oxidised pyro, which he clearly proves by experiment to possess that power, but in an exalted degree where the light has previously acted, thus confirming Mr. Warnerke's earlier opinion that the effect was the result of the combined action of light and development. So far I am entirely in agreement with Mr. Haddon, and also to a certain extent when he goes on to explain why the tanning action of the oxidised pyro does not take place over the whole surface of the plate, instead of only in the exposed parts. As he puts it, where development takes place, oxidation goes on more rapidly than in the unexposed parts where no chemical action ensues. Naturally, when the reaction is more energetic, the tanning effect may be expected to be more rapid and more marked, and, while it is going on more slowly over the whole surface, it is only in the exposed portions of the film that under proper conditions it becomes practically useful, as in the Warnerke process. Those who are familiar with that process will be quite aware that practice entirely bears out theory, for, if an under-exposed film be developed right out with the same developer, it will be rendered insoluble over its whole surface; whereas, by using fresh developer in which the oxidation has not gone so far, the general tanning action is reduced without lessening the effect in the exposed portion.

But where I cannot help differing somewhat from Mr. Haddon is in attributing the whole of the indurating effect to the "tanning" action of oxidised pyro. True, the oxidation is greater, as has been shown, in the exposed portions, where the hardening effect is also greatest; but is the whole of that greater action due to the pyro, or may it not possibly be to some extent due to direct oxidation of the gelatine? Assuming that the primary action of the developer is to decompose water, and that the hydrogen goes to the bromine of the exposed film, is it certain that the whole of the oxygen goes to the pyro? I know it may be said here, as in the case of the comparative affinity of bromine for gelatine and for alkali respectively, that the free oxygen is far more likely to fly to such a greedy absorber of it as alkaline pyro than to gelatine; but, since a similar hardening effect occurs where no pyro is present, it does not seem unreasonable to suppose that at least a portion of the work done may be due to other causes.

This brings me to Mr. Haddon's explanation at the close of his paper of the hardening action I mentioned in connexion with solarised gelatino-chloride paper, and here I must humbly differ from him *in toto*. In the first place, I have only to use one of his own arguments against him. He attributes the hardening action that occurs in the exposed portions of a gelatino-chloride print to the chlorine liberated from the darkened parts; but which, I would ask, is the chlorine likely to have the strongest affinity for, the free silver in the paper or the gelatine? Without, however, pursuing that argument further, I may look at it from another point of view. The well-known reaction that follows the passing of chlorine gas through a solution of gelatine to which Mr. Haddon alludes in his paper is one thing, but the action of dry chlorine upon dry gelatine is quite another, and it seems to me very questionable whether, even in the absence of free silver, any combination could possibly take place. Perfectly dry chlorine has been shown to have no action upon silver foil, moisture being absolutely necessary before combination can take place; and though, as is well known, a certain quantity of moisture in the film is necessary for successful printing, it is scarcely sufficient practically to set up any such combination, and, if it were, it would be more likely to be with the free silver.

If we want an analogous instance of difference of behaviour in the dry and moist condition of two substances, we have only to turn to albumen. In solution, this is instantly coagulated by heat or by alcohol, but, in the dry state, it is absolutely unaffected by either. This is easily demonstrated by dipping or soaking a sheet of albumenised paper in strong alcohol, and, after drying, redipping into cold water. The film of albumen will be entirely removed. Or pass a hot iron over the paper, using heat enough to almost scorch the paper, the same result will occur on soaking in water, but if the paper be dipped into boiling water, or into dilute alcohol, the film will be entirely coagulated, and will resist any further treatment with water. In the same manner, I think dry chlorine gas, evolved from the film during exposure, will prove equally ineffectual in rendering the gelatine insoluble.

But I will go further than this, and take a gelatino-chloride emulsion in the jelly state, in which condition of moisture all the ingredients or products of decomposition are free to react upon one another. On exposure to light, in a clean glass bottle, the outer layer of emulsion will be found to become quite insoluble, so far as the discolouration may have penetrated. Now, here, I think, it cannot be doubted that the liberated chlorine would go to the silver and not to the gelatine. But one of the results of the interchange of elements would be the liberation of oxygen, which I assume to be the active agent in the absence of pyro.

One other instance strikes me as I write. Some years ago it struck me to utilise the rich, red-brown colouration of a gelatine film after exposure to light for the purpose of making a dark-room window. I accordingly made a solution of gelatine containing silver nitrate, and this was left for several days in strong sunshine, in order to give it as deep a colour as possible; but, on attempting to remelt it, it was found to have become quite insoluble where the light had penetrated, though the centre portion that was unacted upon, or only partially, melted after some time, and came away nearly colourless. Here, then, was neither pyro nor halogen, but simply the probability of oxidation from exposure to light—that is to say, oxygen was liberated by the reduction of the silver nitrate, and this combined with the gelatine to render it insoluble.

Before leaving this part of the subject, I would say that I by no means

disagree with Mr. Haddon on the main part of his arguments, but I offer these suggestions towards explaining some points which his theory does not cover.

W. B. Bolton.

FOREIGN NOTES AND NEWS.

Restrainers.—Concerning the action of bromides, iodides, and chlorides in the developer, J. Von Norath writes, in the *Deutsche Photographen Zeitung*, that the common idea that bromide acts as a retarder is quite incorrect. It is possible that bromide prolongs development, but this condition may be brought about by other factors. Take a highly sensitive dry plate, and dip it for a few minutes in a three per cent. solution of bromide of potassium. Wash and dry it, and then expose and develop. It will be found that the sensitiveness is much diminished. This he ascribes to the absorption of bromine by the bromide of silver. The greater the amount of bromine present in the emulsion, the less the sensitiveness of the plate. As it is necessary that bromine should be absorbed from the bromide of silver on the exposed portions of the plate, that developer is the most active which absorbs most bromine. It is undesirable to add much bromide to the developer unless correspondingly longer exposures can, or should, be given. But for special purposes, where hard, dense negatives are wanted, large additions of bromide can be made with advantage. Iodide of potassium acts very much more powerfully than bromide, and small additions of this salt to the developer will greatly prolong the time, and increase the contrast. Veiling of the image may be prevented by the addition of only a few drops of a two per cent. solution. A practical application of this property of iodide of potassium may be made in line negatives upon an ordinary dry plate. Expose twice as long as usual, and develop with a solution to which has been added five per cent. each of a 1 in 50 solution of iodide of potassium and a 1 in 200 solution of bromide of potassium. The development is very slow, but produces exactly what is required, a black-and-white negative. Chlorides are also conducive to slow development, but have the property, under suitable circumstances, of producing a brown image. The Eastman Company have taken advantage of this in one of the formulæ for the development of their papers, the brownness of the image being regulated by the amount of chloride of potassium added to the developer.

Screens for the Joly Process.—In the *Photographisches Archiv* we read concerning the great difficulty of this process, the productions of the screens, that Joly prepared them by winding alternate threads of red, yellow, and blue silk upon a glass plate, to which they were then affixed with varnish. A. Baumgartner has obtained a patent in Germany for another process. This is based upon the principle of first printing a grained screen in oil colour, and afterwards treating the uncovered portions with dyes that do not affect the print in oil colour. A transparent support is coated with gelatine, or other suitable substance, and upon it is printed by lithography a blue grain in oil colour. The screen is then dipped in a solution of red aniline dye, which does not penetrate the portions protected by the oil colour. After drying, the screen receives a second printing. This is in yellow oil colour, and overlaps the red and the blue, producing an orange and green grain. If necessary, the unprinted portions of the screen may be modified in colour by again dyeing. In this way grained screens can be produced with red, orange-green, and blue dots without any colourless spaces, and, according to the desired effect, the series of colours may be varied. The following is an alternative process: Upon a sheet of celluloid overlapping dots of red and yellow are printed. It is then coated with blue-stained gelatine sensitised with bichromate of potash. After the back has been exposed to light, development proceeds as in carbon work. The blue gelatine not only adheres to the previously colourless portions of the screen, but changes the yellow grain to green. The red and orange, however, remain unaffected. In this way a screen of similar colours to the first process is produced. If it is wished to make a glass screen, the colours may be printed upon transfer paper and then applied.

Liquid Prisms.—We also read in the same paper that B. Wolter has found o-monobromnaphtalin a good substitute for bisulphide of carbon. It is very transmissive of ultra violet, and has high power of dispersion. Wolter, with such a prism, could trace the spectrum beyond N upon a solution of fluorescine. It is without odour, and its indices of refraction are much less susceptible to variation by changes in temperature.

The Berlin Industrial Exhibition.—Financially, this has not been a success, for we learn from the *Photographische Correspondenz* that there has been a deficit of 1,200,000 marks. It is thought this might have been foreseen, considering the colossal proportions of the undertaking. But Berlin is rich enough to pay for the glory, and the *Correspondenz* thinks all who visited the Exhibition must acknowledge it was magnificently conceived.

Blue Tones for Collodio-chloride.—As a simplification of the process recommended by Hrdliczka for the Vindobona paper, Professor Alex. Lainer recommends the following, in the *Photographische Correspondenz*:—After the prints are deeply printed, wash them in six or eight changes of water for ten minutes, then transfer to a bath consisting of—

Water	1000 c. c.
Hyposulphite of soda	80 grammes.
20 per cent. solution of sulphite of soda	50 c. c.

They should be kept in motion for about three minutes in this bath, and it should be freshly made for each batch of prints. The prints should again be washed in four changes of water, and kept constantly in motion. The toning bath contains no lead. Take 1000 c. c. of water, add 50 grammes of sulphocyanide of ammonium, and, when dissolved, add drop by drop, with constant shaking, 50 c. c. of a one per cent. solution of chloride of gold and potassium. The prints turn brown, then blue in the half-tones, and finally deep blue in the shadows. The prints take on a considerable quantity of gold, and the toning is consequently very thorough. The bath should not be poor in gold, and the toning should be complete in five minutes; if slower, more gold; and, if necessary, more sulphocyanide must be added to the bath. More intense shadows may be obtained by using a concentrated solution of sulphocyanide of gold, made almost at boiling point and diluted before use. The prints also seem to lose less in this bath. The sulphocyanide of ammonium and gold is prepared by adding to a diluted solution of sulphocyanide of ammonium small quantities of neutral chloride of gold and potassium until the red precipitate formed is redissolved.

Aluminium Printing Plates.—Considerable attention has been given to aluminium in Germany as a substitute for stone, and recently, at the Vienna Photographic Society, C. Kampmann, of the Vienna Technical School, read a paper upon its application to photo-mechanical work, and exhibited a variety of specimens. Zinc has been found wanting as a substitute for stone, but aluminium would seem to be of great promise, and offers great advantages in its lightness and freedom from limitation of size, as compared with stone. Joseph Scholz, of Mentz, has worked out the process, and has given it the name of Algraphy. It is protected by patent, but may be worked by any one who buys the plates of him. It has attracted the attention of the Austrian Government for cartography, and the specimens shown were described by Herr Kampmann as quite equal to prints from stone, or even somewhat better. Experiments have also been made with aluminium as a substitute for glass plates in collotype, at the Vienna Technical School, under the supervision of A. Albert. He says that silicate of soda and beer formed an excellent substratum, and that the gelatine adhered so well to the plate that punctures of the film did not spread, even under pressure. Even without any substratum, the film adhered well to the plate. The plates were of the thickness of ordinary good cardboard, and, if dried in the oven on sheets of plate glass, they remained flat and the films were even.

Retouching.—In Liesegang's Photographic Almanac we see a hint from Paul von Janko that may be of service. Instead of varnishing the negative, he recommends the use of the varnish with the pencil. A drop of varnish is spread very thinly upon a glass plate, and this is touched from time to time with the point of the pencil. As soon as the pencil fails in its work, it is again applied to the spot of varnish, and the latter is renewed as often as it becomes hard. Retouching in line or point can be done and the varnish is not visible on the negative.

Photography and Crime.—We also see in Liesegang's Almanac a very interesting communication from Dr. Paul Jeserich. A man named Wetzestein was accused of murdering several women, and a number of hairs from the hands and clothes of one victim, an old woman, were sent to Dr. Jeserich for examination. There were

about forty hairs, and after considerable investigation seven were found that did not belong to the victim. Upon comparing the latter with the hair of the accused, it was found that they corresponded in thickness of the shaft, formation of the root, pigment cells, arrangement of the fibres, &c. The agreement was so perfect that Dr. Jeserich declared them to be hairs of the accused. The evidence of the micro-photographs was so damaging, that the defence asked for the appointment of a second expert. Professor Waldeyer was selected (a man in whose judgment Dr. Jeserich had full confidence), and all the hairs were sent to him without any information concerning the evidence already given. When the day for the communication of Professor Waldeyer's results arrived, they exchanged reports, and found that they both agreed that seven of the hairs were not the victim's and corresponded in all respects with the hair of the accused. Wetzestein was convicted and executed.

CYCLING AND PHOTOGRAPHY.

[West London Photographic Society.]

Some three years ago my friend, Mr. Varden, and myself read before you a joint paper on *Round West London with Cycle and Camera*, and from remarks which have lately been made, I find that a similar paper is expected to-night; and though I am at a loss as to how such an impression arose, I must, in the first place, apologise for not doing so. Besides, I am afraid that the only parties who obtained any real benefit from the said paper were the joint authors, and perhaps indirectly through them the members of the cycling contingent, as they have more than once visited several of the places mentioned and illustrated on that memorable occasion. Possibly you may, however, think me wrong in this view, as I have some indistinct remembrance of a certain Survey of West London which is, I regret, in rather a moribund condition, and which may look upon the said paper as its parent; and though I disclaim the authorship of this Survey, I look forward to a better outlook for it under the care and supervision of our friend Mr. Dixon, and hope it may be the greatest and most useful work that this Society has ever undertaken.

My endeavour to-night shall be to place before you some of the advantages, as well as the disadvantages, of combining the two hobbies, and also some remarks on the apparatus, both on the cycling and photographic sides of the question.

A few weeks ago, in one of the cycling journals, were printed copious extracts from a book of Nathaniel Hawthorne, in which a description of a railway journey was given. The hero, an aged scholar, travelling for the first time, moralises on the nomadic tendencies of the human race, and winds up with these words which, though applied then to the iron-horse, are far more applicable to the steel steed:—"These," said he, "are positively the greatest blessings that the ages have wrought for us. They give us wings, they annihilate the dust and toil of pilgrimages, they spiritualise travel. Transition being so facile, what can be any man's inducement to tarry in one spot, when he may just as easily dwell where the fit and beautiful may offer him a home?" I have claimed that these words more truly apply to the cycle than the railroad, for who has not sat in a railway-carriage and been whirled past nooks and spots where *pictures* seem waiting to be taken, and felt the desire springing up, I wish I could stop the train here and get that bit with my camera, and then go on again; but, if wishes were horses, beggars might ride, so we must stay where we are, or at most take a note, and pay a visit at some future date, possibly only to find that atmospheric effect is changed and the view altered. But to take an example.

Some of you, doubtless, will recollect a short time ago meeting some cyclists all with cameras. It was a lovely spring morning and the roads were in splendid order, and the high speed of seven or eight miles an hour was kept along some four miles of a main road, then turning down some old-fashioned English lanes, past a red-tiled church shaded by lofty elms, under which a stream flowed in which some cattle were standing and browsing on its banks. Here a halt was called, and the photographic possibilities discussed; but, the conclusions being principally negative (the effect being due to colour, not light and shade), they again proceeded further in search of the beautiful—through a sleepy old town nestling by its church, which this time was perched on the brow of a hill and overlooking a wide valley, the scene of several conflicts in the Civil War, on to an ancient hotel with recollections of the coaching days, where another dismount was made and the inner man refreshed with biscuits and cheese and a glass of milk or ale. On a few miles more, and another rustic village, with church and almshouses, looked tempting, and so the machines were stacked. Here the vicar, looking from his windows, saw them, and kindly invited them to enter the church, himself shortly after joining them, showing and explaining the different objects of interest—ancient monuments, chained Bibles, &c.—while some photographs were taken, both outside and in. But the time had passed too quickly and so it was necessary to hurry on, which was done at a higher speed—two more dismounts and some more views being taken on the road—and they arrived at their destination, tired and hungry, but quite ready to do ample justice to the savoury dinner which was soon smoking on the table in front of them. After dinner the cameras were erected, and they wandered through the woods for which the place is famous, meeting some friends who had come down by rail. Then back to the inn and a good cup of tea, followed by pipes and tales; and then, with lighted lamps, off home on their return journey, the end of which was accomplished at a seventeen miles bat, possibly as a protest for having dallied earlier, certainly a good end to a jolly day.

But their friends by rail—what of them? In the morning, an hour before the cyclists, crowding into a dirty train, with five or six on each seat and as many standing; then a rush upstairs and downstairs to another platform, to find that they need not have hurried, as the other train was late. The other train, decidedly an improvement on No. 1, keeps them half an hour, and then all is scramble and off they go, all in different carriages; stopping here and there, they may jump out to try and join some of their friends, and have to stand till the next station for their reward. Whisked past the villages where the cyclists will shortly be exposing their plates, seeing only the church spire and the cottage roofs, they arrive at the nearest station, then a long dusty walk of four miles, quite unphotographic, and they reach the rendezvous.

By some one's blunder they had expected the cyclists to be there before them, and, had the road been similar to that they had walked, it is quite probable they would have been; so they waited some time, the more so as a grey pall seemed to have dropped from the clouds and covered everything (which cloud was only dispelled by a sharp shower shortly after the arrival of the cyclists); then had dinner and off to the woods.

It is kinder to drop the curtain over the long, weary road back to the station and the crowded journey up to town.

By the way, why is it that those who do not cycle think that the greatest enjoyment of cycling is to hump your back, fix your eyes on the tyre (looking out for punctures, I suppose), and grind your nose on your wheel? I think cyclists are to blame for this, for their conversation is something about their wheels or their speed, or the surface of the way, and seldom or never about the beauties of the road or country through which they pass.

So much for the cyclists' advantages; now for the other side.

Firstly, the question of time. Cyclists are bad timekeepers; it is always the unexpected that happens—the delay is occasioned by some accident either to themselves or some one else—so if you arrange to go by train to meet a party of cyclists, give them plenty of margin, unless you are travelling by the lines south of London, in which case this is not necessary. The chain is only the strength of its weakest link, and in club riding the speed is that of its slowest member. The last two times I rode into London by the Bath road may help to show how great is the difference—the one time it took us a little over three hours to do fourteen miles, while the same stretch was done on the other occasion under three-quarters of an hour.

Secondly, an accident. This is not uncommon, though I think it is a matter for congratulation that I only know of one case of serious accident, since I began to cycle in 1877, among my personal friends. I have, however, a lively recollection of two of our vice-presidents riding a tandem tricycle down a hill at the foot of which was a ford; when the front rider saw this, instead of using the brake he applied his toe to the chain, but in the wrong way, so giving his foot a nasty squeeze, besides causing the chain to mount on the cogs and lock; his partner at the same time tried to use his feet (his legs were more than the usual length) as a ground brake, with the result that he tore the sole from the right boot. The locking of the chain caused the key that held on the wheel to give way, splitting the hub, with the result that fortunately they collapsed a few feet from the edge of the water. Seen from behind, the matter looked terrible, and till we found no one was hurt we were serious enough, but then the remarks were ludicrous, especially as we had about three miles to go—one bicyclist wheeling two bicycles, the bicyclist wheeling the damaged trike holding it together as he went along, and the two damaged riders following with the others, the one hopping and the other with the sole of his boot going flap, flap, flap. Since writing the above I have been over the road we then walked, and was struck with the thought of how terribly woe-begone we must have been, as I had no recollection of what it was like. An accident of this kind, however, does not often occur, and we learnt experience, for never again would we trust two novices on one machine. Slight accidents, such as punctures, we have been on our runs wonderfully free from.

Thirdly, there are the worries arising from the peculiarities of the different members and also riders one meets. For instance, one likes to scorch, and probably does not know the roads, and so takes the club miles out of its way along dreary roads, through waiting at the wrong corner, or has possibly to be brought back, while the members wait for the wanderers' return; another likes to crawl; while a third has a fancy for riding down milestones, and is a source of danger to all who are following; and still another constitutes himself the guide, and we find ourselves some dark night describing a circle. These, however, are mere trifles, and often cause most fun. So much for members, now for those we meet. The worst are the hangers on. In our runs, for reasons noted hereafter, there are generally two or three tricycles. Now, a bicyclist merely calls another bicyclist who passes him a scorcher, even if he is only riding at ten or eleven miles an hour, but if a three-wheeler going at this rate dare do such a thing down goes his head and up his back, and off he goes for a

short distance. Coming up from Ripley at a steady twelve miles an hour, we were much amused by one such whom we passed on the level, or going up hill, no less than six times between the Talbot and the Angel, Ditton, to be passed ourselves whenever the grade was down. After getting through Kingston the trike moved ahead, and, passing for the seventh time, made such speed through Petersham that we passed the bicyclist at the foot of the hill leaning on his bike and mopping his brow—looking perfectly astonished. At the same time we meet these peculiarities in every-day life, so that it is hardly fair to call it a disadvantage of cycling, except to the extent that is owing to the *camaraderie* of the wheel.

We have now dwelt long enough on this subject, and so pass on to the apparatus—firstly, cycling; secondly, photographic.

First, the machine, of whatever kind it is, must be a pneumatic. True you court delays through punctures, but the difference in the comfort, freedom from vibration, &c., make it quite worth the risk. Next as to shape. Firstly, the high machine—good old Ordinary, as it is called. This is strongly advocated by one of our members; and, though I must agree with him that it is by far the most comfortable machine to ride, the danger of a sudden dismount, generally by way of finding yourself on your back with the machine on the top of you, places it practically out of the running; besides, it is not so speedy as the smaller wheels. Next we have front-drivers. This is a modified form of the good old ordinary, having the front wheel of thirty-six to forty-two inches diameter geared up to sixty or sixty-three, which, the saddle being placed further back, are not so liable to give you a "cropper." Then, with smaller wheels still, and generally equal sized, we have the Bantam. All these machines have one great advantage over the next class (the rear drivers or safeties) in their practical (though by no means absolute) freedom from the demon "side slip." What this is, no one who has not experienced it can tell. You are joyously riding along a road that is slightly wet, when suddenly you find yourself seated (not very gently) in the mud, while the machine is sliding along gracefully about twenty yards from you, and you cannot for the life of you tell how it happened; but, if you don't know what it is, be careful and do not laugh at a friend in such a plight. I once did, and I found myself alongside of him, while my machine was keeping company with his, thus giving both of us a good lesson in side slip. With this one objection against it we may look upon the safety as the more desirable mount; at the same time, it may be as well to warn those who think of getting one against a rage that is beginning for a very light machine. Some two years ago the best makers were turning out roadsters which only weighed twenty-two to twenty-eight pounds, but they found that the strain twisted the frame and made the driving harder, and so the ones they are now making weigh from twenty-eight to thirty-five pounds. We then come (as it would not do for me to bring tandems before you married men) to the last machine, "the tricycle." This in speed and weight is very little behind the safety, and the only disadvantages are the three tracks when you come to a bad road, and the most serious one the space required for storing. For street or traffic riding it is, however, quite without equal, and one of my friends uses one regularly, keeping his bicycle for country roads. Many people think any one can ride a tricycle, and true it is that it will stand more bad usage than any other machine; but riding is quite another matter, and the trike has to be learned just as carefully and thoroughly as the bike.

But now, to apply these machines to our purpose, we must without hesitation give the palm to the three-wheeler. It can carry anything up to twenty-four or even thirty inches square and be none the worse for it. On one special occasion I rode forty-five miles in three hours, carrying my whole-plate, weighing seventeen pounds, so that I can fairly speak from experience. Next, I think, we must place the G.O.O., then front-drivers, and then safeties. In all these cases we are confined to smaller cameras, nothing larger than half-plate being possible. I place safeties last, as, if the apparatus is carried on the machine, it is bound to alter the steering, even though a considerable amount is carried in the frame, which it does not do in the others.

And now, before passing to the photographic side, let me advise you, if you want a machine, to get a first-class one, and, if you have not enough money to run to a new one, rather purchase a second-hand one than a new *second-grade* one. You can generally find out something of the history of a machine if you can take a friend who is a rider, and he will see a lot that you would pass over. My own machine is, as many of you know, a Referee tricycle with the triple head, which is not only stronger but also lighter than the ordinary single head, and weighs—break, mudguards, valise, &c.—a few ounces over forty pounds, or, weighed as machines usually are in racing order, thirty-seven and a half pounds, and though I have travelled nearly 12,000 miles on it, I have not spent one shilling on repairs. This will show you the advantage of getting a first-class machine in the first instance.

But now to turn to the photographic section. First, plate-carrying apparatus. In the first place, we may dismiss all cameras which are made on the "well principle" as practically useless, as the vibration puts them out of gear. I saw some plates which were taken with such a camera. It was the friend who tilts at milestones who, in some unexpected way, became mixed up with his bicycle—his hands were on the ground, while the spokes of the front wheel were round his wrists, those of the back wheel being similarly round his feet, and he was unable to move, and so appealed to another member to help him. This one had the camera in his hand, and the position was so ridiculous that he took a snap-shot, to find on development that the hands and head, considerably out of focus, were on one plate and the body and feet on another; and anything more disappointing could hardly have happened, as he had told all the other members of it. My own experience is exactly similar, and I could show you a brass slide on which the plates used to run with a beautiful series of "U's," gradually increasing in depth from No. 1 to No. 12. We are thus confined to roll-holders, bag-changing, and dark slides. Roll-holders would be the method, *par excellence*, were the films perfect; but any one who has the same experience of them as some of our members will be careful ere getting one of these, to say nothing of the difference in price of the films. Bag-changers come next; they may be used either with cut films or plates. Cut films are an advance on rollable films, but still not equal to plates. With plates, the only difficulties are the weight and the vibration causing them to make a dust by grinding the edges of the case; this latter may be overcome by passing a sponge lightly charged with glycerine round the sides in the dark room before putting in the plates. Bag-changers have the advantage that they are self-contained and without loose parts. Dark slides are still better than bag-changers in my opinion, as you can carry half a dozen small-sized ones in your pockets, and they may be charged with any different kind of plate to suit the circumstance, while in the other case you must expose in order. So much for the plate carrying apparatus. Next we must consider the lens. Any good lens will do, just what the photographer is used to. At the same time, it should be fairly rapid, as probably the exposures will be entirely shutter ones.

But now I must ask your permission, ere speaking of the cameras themselves, to make a digression. I have seen several photographs taken from the machine, especially some fine ones by our first President, Mr. W. England; but such a method is not to be recommended except to the veteran photographer, who can take in the view with a glance and shift his position without studying his ground-glass or view-meter, so as to get the best result. What we have found best is, supposing on our wanderings we come across a spot which seems to lend itself to picture-making, to stack the machines, and to have a look round and discuss the probabilities; then, if the verdict—a question in which the lighting has consideration—is favourable, we proceed or retrace our steps to the nearest quiet inn and stable the machines, order refreshments, and, while they are getting ready, visit the spot with our cameras and make the most of our time. Back to the inn for lunch, then a short smoke and a chat, followed, perhaps, by more work, and then on again—another stop, and then dinner. Some of us have some idea where these spots and inns are before we start. Then some more work, and then on again till tea (one member suggests at Eastcot), and then home in the dark, possibly well pleased with ourselves—certainly the better for our outing. With this method of working you will see that it is immaterial what size of camera we use so long as we can carry it on our machine; at the same time we must confess that the more we study the question the more for this class of work are we inclined to favour small sizes. We may, however, dismiss at once the pocket Kodak as too small. The next size is $2\frac{3}{8} \times 3\frac{1}{4}$, or the fourth of a half-plate, a size we rather fancy, as lantern slides can be made direct from it; besides, using a lens of the usual angle, say, a four inch, gives such depth of focus with almost microscopic sharpness, that with care enlargements equal if not even superior to large direct prints may be obtained. The next size, lantern plate, $3\frac{1}{4}$ square, is strongly advocated by our past President, Mr. J. A. Hodges, though we do not care for it, being the same fault as we have to find with 5×4, viz., too square. A new cut film camera is shortly to be placed on the market by Messrs. Beck—we believe the size to be $2\frac{1}{2} \times 3\frac{3}{4}$—which is again a good shape for landscape work, being $1\frac{1}{2} \times 1$, and the same proportion as the favourite landscape size, $7\frac{1}{2} \times 5$. Next comes the popular quarter-plate, the 5×4, already disposed of, and the half-plate. Lastly comes the $7\frac{1}{2} \times 5$ already mentioned; but above this size we hardly think it advisable to go.

Another consideration in regard to the camera is how it is to be carried. This question only arises in regard to the safety; with the tricycle anything can be carried. With the front driver there is only the backbone to carry it on, and the simplest method is one of the multums of the early days of 1878, unless in the case of a small camera, when it can be carried in front. With the safety, however, we have already mentioned that carried in front it alters to some extent the steering, and the other method is, slung on the top bar between the legs. This seems the best way, as there is the minimum of vibration in this position; however, we are tied down that the camera and case must not measure more than four inches, otherwise it will interfere with the action of the legs. The only other method of carrying is by a knapsack on your back; but, judging from what I have seen and my own experience, I do not recommend it.

And now to consider our cameras. In the first place, box cameras larger than quarter-plate or measuring more than four inches have been disposed of; second, for the sizes larger than that we must have folding cameras, and for the same reason discard the square cases usually sold for half-plate and 5×4. Most modern cameras fold up into something like two and a half to three inches, and I found it a good plan to wrap the camera in a piece of waterproof and fit it on to the bar by two straps; the three

dark slides make up into a similar parcel wrapped in the focussing cloth and suspended by two more straps; then a long strap is passed round the neck under the first and over the second strap on the slides, and again under the first and over the second strap on the camera round the central pillar, noticing to keep it well down so as to stop any tendency to swing, and similarly back along the other side of the apparatus to the neck, where it is buckled. The great objection to this is the time it takes to get the apparatus packed and unpacked, and so I made a light wood frame with waterproof canvas back and stiff front which locked with a key, and which when opened allowed the camera and slides to be lifted out at once. So much for the larger sizes; for the smaller sizes either box or folding cameras may be used. I prefer the folding, as with it you have the opportunity of using different lenses, which is a great advantage. The box camera, however, has the great advantage that it is always ready for use.

And now, in closing, let us sum up what we may consider necessary as the complete outfit for a cycling photographer.

First, a good cycle, either two or three wheels, complete with gear case, mud-guards, and brake, weighing in the one case thirty, in the other forty pounds, pneumatic tyres, and fitted with spanners, pump, repairing outfit, and lamp, not forgetting a cyclometer, to give you some idea of the distance travelled. A case for carrying the camera should be fitted to the frame, and luggage carriers to the handle bar for the tripod and lens case.

Second, a light tripod which would be rigid (it requires to be invented yet) and fold up into small compass—most on the market are too short and not steady enough.

Third, a battery of lenses such as Taylor, Taylor, & Hobson's Combination, with possibly a tele-photo attachment. I have more than once found it useful.

Fourth, a light camera and half a dozen slides, preferably Edward's, which are very thin and light, probably not taking more space than the usual three wooden ones. The camera should have a long extension, and preferably be half-plate.

Fifth, a shutter to fit all the lenses, both time and instantaneous, with a trigger, as well as a pneumatic release, and also a finder to attach to the top of the camera, so that it could be used in the hand.

Sixth, in addition I should have a small box camera, say, quarter half-plate size, which could easily be carried in the pocket, or attached to the lens box.

This apparatus should not weigh more than five or six pounds all complete, and the reason for my choosing the larger size is that I believe more careful and more serious and better work is done, than is the case with the smaller size. I have intentionally left out of the question all the apparatus required at home, as this is a necessity of the photographer whether he is a cyclist or not; but as cyclists have so many more opportunities at smoking concerts, &c., of popularising their art by lantern displays, &c, let me impress upon them to use every opportunity to do so, and also to bring them to our meetings till every photographer shall be a cyclist, and every cyclist a photographer.

I. Stein.

OUTSIDE STUDIO WORK.

V.

The taking of portraits in outside situations has always been an attractive source of amusement with many ladies and gentlemen, and much pains are sometimes taken to secure good results in this branch of photography.

That really excellent portraits are obtained in outside situations when a few simple contrivances are brought into play to aid the operation is well known, and, when such pictures are shown alongside indoor studio exposures, it very frequently happens that those obtained by outside means are voted the palm for superiority.

In this kind of work, like all other branches of photography, the first and most important of all operations is the lighting of the subject.

In inside studio working it often happens that long and patient experiments have to be conducted by an intelligent operator before he is able to select the best methods of lighting a face or full-length subject, for, with the constant changing of the source of light during different seasons and varying hours of the day, the arrangements connected with the selection of the best positions a sitter should occupy, as well as providing means for the shielding of light by partly opaque screens, often gives no end of trouble and anxiety before the most suitable positions are finally hit upon and selected.

And if this prove the case in inside situations, where every contrivance that can be thought of is brought into operation to aid in securing the best results, how much more necessary is the provision of similar aids when the operation is being performed in outside situations.

As I write I see examples of outside portraiture before me that were taken over thirty years ago, and I can recall the pleasure and excitement that followed the rigging up in the garden at that distant date of the extemporised studio, by which means most excellent results were obtained long before the introduction of the fast bromide plate.

To my thinking there is a keen enjoyment in outside portraiture by means of an extemporised studio which is entirely lacking in the conduct of such work indoors, and, when any one enters into this work with a spirit of determination to secure the best results, it may be taken for granted that numerous makeshifts will be tried in the hope of being able to light a face or costume to the best advantage.

The fault in outdoor portraiture, where no special provisions are made to artistically light up a face or figure, invariably lies in the production of too much flatness, a result caused by the absence of one main source of light. No doubt, much may be done by selecting a spot where more or less top light only reaches the sitter, such as in corners of buildings or in proximity to high walls, where such are found near the gables of houses; but top lighting does not suit every class of face, and, at times, such has its disadvantages, especially where the eyes are of a sunken character.

It is not always possible, however, for a worker to secure the advantages of a naturally suitable situation for lighting a face in outside portraiture; but, on the other hand, there is generally some shady spot to be found near most country houses, even although there are no gables or high walls to be taken advantage of in the situation. These shady places should be selected whenever possible, and then, by means of screens, a main source of light be brought to bear upon the spot selected for accommodating the sitters.

Of the many different methods of arriving at this result, I need only mention one or two makeshift arrangements, which I have seen employed with most excellent results, and the rigging up of which not unfrequently affords a considerable amount of pleasure and satisfaction to those interested in carrying out the operations successfully. A situation having a northern exposure is to be preferred at all times; but, in cases where such are not available, it does not follow that arrangements cannot be carried out on that account, the difference being, that in the one case suitable conditions are provided with much less trouble than in the other.

I have often stood in olden times at many country fairs, admiring the system of erecting booths as displayed by our itinerant brethren, and need I say I have profited, in many instances, by what I have seen at such places, for it is, as a rule, good to follow the lines upon which a practical worker has to rely for the earning of his bread and cheese?

I think I cannot, therefore, do better than suggest, to any one contemplating the outlay of a little money and trouble in the rigging up of an extemporised outside studio, the advisability of spending a copper or two in a visit to any well-appointed photographic booth, so frequently seen at country fairs, and which are here to-day and away to-morrow; such an inspection will teach any one a lot in a few minutes, simply because, in the erection of these canvas studios, more or less brains and practical experience are combined and displayed in every item that comes under one's observation.

About the first thing that will strike an observant visitor in search of information is the position invariably selected whereby as much side light from the sunny side is capable of being screened off without any great trouble or expense. This, it will be found, is generally accomplished by means of the pitch of the cross supports that rise from the side poles at either end of the studio, and by means of which not a ray of direct sunlight is permitted to enter the booth. Outside, all may be glare and sunshine, and the eye quite pained with the full glare of such, but, once inside and under the shelter of this often-patched and weather-beaten welcome retreat, nothing but a delightfully soft, subdued light meets the eye, with a strong, concentrated, main light coming from just the direction best suited according to the time of day and season of the year—this very often means an opening in the roof of the booth, which is easily provided for by unhanging the canvas at such places as will admit not only the proper quantity, but likewise the admission of the same from a sufficiently high-side pitch, somewhat in front of the spot selected upon for posing a sitter.

One of the funniest sights, and, I am not ashamed to confess it either, one of the best lessons I ever got in outside portraiture, was derived from witnessing the erection of several photographic booths at Brodick Fair, that pandemonium of fun and frolic, and where every cheap Jack's trade under the sun is represented. I have seen at Brodick eight to ten well-appointed canvas booths erected, and all doing a roaring trade in less than half an hour. The marvellous way that every bolt and nut was placed into position with such precision was truly a sight to be remembered, and, as far as the lighting of the sitters was concerned (and

this is the main point in portraiture), not a fault could be found with any one of the productions given out for the modest sum charged by the good lady of the establishment, who, by the way, plays a not unimportant part in the business either; for, notwithstanding, that she does look after the dollars, she is always a mark for the good-natured banter which is invariably in full swing between opposition booths (as many imagine, but which are often one and the same copartnery), and by which fun and frolic visitors are unknowingly made to enter one or other of the studios wearing their happiest expression, for such fun and frolic means nothing more nor less than good business in the long run, and many an extra half-crown pulled from a pocket by such means.

A local gentleman has somewhat recently taken out a patent for a portable form of outside studio, in which the main features are the employment of coloured panels in a large hood or umbrella, capable of being erected at any height, and placed at varying angles as found desirable, according to the direction in which it is required to screen the light. In many respects the idea is a good one, but the presence of a high wind would tend to cause anxiety as to the stability of the hood No doubt, however, the reflections caused by using various-coloured filters tend to give a variety of effects in outside lighting, which is a distinct advance in this kind of work.

There are many simple contrivances that any one can adopt in retired places, such as the employment of a couple of high winter dykes, or clothes horses. By folding these into such positions as will permit of their enabling a top-side screen of thin book muslin being erected at a suitable angle overhead, and by staying the clothes horses firmly on the ground by means of pegs and ropes, too much top front light can be cut off by means of erecting cross poles carrying a white sheet, one side of the interior being lined with any dark-coloured material, such as a large table cover, the other having a white lining.

A good background is a necessity, but this is easily provided by stretching either suitable paper or cloth over such an article as a clothes pole fitted up at the end of the winter dykes. Of course, contrivances of this description are fair-weather adjuncts, but by such homely, simple means results in portraiture are obtained that will vie with, and often surpass, results obtained in costly appointed studios.

It is often urged that equal results in portraiture are got by means of view lenses to those obtained by the more costly portrait combinations. I am no believer in such statements; there is a roundness and plasticity in a portrait taken by means of a good portrait combination that is not obtainable by the other instrument, and no one knows this better than those who are in the habit of operating with each of the above forms of lenses.

If equal results could be got in portraiture with cheap view lenses, as are obtained with the high-priced portrait combinations, the day of portrait lenses would be a thing of the past. There is a softness and modelling in a head taken with a good portrait lens that is not possible with a view lens. In many respects this kind of work affords much pleasure and amusement when gone about with a little forethought in rigging up an extemporised studio. T. N. Armstrong.

EDWARDS'S IMPROVEMENTS IN PHOTOGRAPHIC-FILM MANUFACTURE.

Mr. A. C. Edwards says:—

"The object of the present invention is to improve means or apparatus employed in the manufacture of photographic films with a view to prevent the latter curling or cockling during the coating, setting, and drying of the gelatine emulsion.

"In carrying the invention into effect I may use a machine similar to those already in use for coating glass plates or films attached to glass plates, and I employ, in lieu of the ordinary travelling band, a band coated with a tacky or adhesive substance.

"I find that a very suitable coating for the travelling band may be made with a mixture of a solution of glue or gelatine and sugar or glycerine, such as the ordinary printer's roller or graph-copying compositions, but any other coating having a tacky or adhesive nature may be employed.

"The flexible film is fed to the machine and is pressed into contact with the travelling band by a roller or otherwise. It then receives its coating of gelatine emulsion in any usual manner, and passes forward sticking to the travelling band, which retains its flatness and resists the tendency of the film to curl up.

"By the time the film reaches the end of the travelling band the gelatine coating is 'set,' and the film may be removed for drying, or the film may be left in contact with the travelling band until dry.

"It will be understood that long lengths of film may be coated by means of my invention, or short lengths of film may be fed to the tacky or adhesive band, by hand or in other convenient manner, and be coated, thus obviating the necessity of attaching each short length separately to a plate of glass or other rigid material, as hitherto practised.

"The claims are:—

"1. In means or apparatus employed in the manufacture of photographic films the use of a travelling band having a tacky or adhesive surface to receive the film while the latter is being coated and the gelatine emulsion is setting and drying.

"2. In means of apparatus employed in the manufacture of photographic films the use of a travelling band having a tacky or adhesive surface."

THE HACKNEY PHOTOGRAPHIC SOCIETY'S EXHIBITION.

Probably a more accurate opinion may be formed of the general progress of photography, as applied to pictorial representation, from the study of the successive exhibitions of an active local society, such as the Hackney Photographic Society, than from the study of a series of exhibitions of more world-wide notoriety, the Exhibition of the Royal Photographic Society, for instance. The latter attracts, and always has attracted, the best of the work of the best of the workers, amateur and professional, throughout the country; but, from its nature, it is safer to regard it as indicating the prevailing fashion in artistic photography than as indicating the general progress of the bulk of those who practise photography. The works exhibited on their walls are but a small selection, about one-fourth, of those offered for exhibition, and, naturally, the individuals who are appointed to make the selection would be chosen from those who are known to be level with the ideas of the times.

The Hackney Exhibition is one in which there is no selection, but every picture sent in is accepted and hung. There is an opportunity, therefore, of inspecting the worst the members do, as well as the best, a severe test for a Society in which a large proportion of the members are beginners; but the Society is to be congratulated on the result. The Exhibition, which was open to the public last week, was undoubtedly in advance of any previously held, and the Members' Classes were noticeable for the scarcity of work, which was not in some way commendable. The leading members of the Society have gained a reputation by their works outside their own district, and their influence on the less advanced members, for their good, was everywhere apparent on the walls of the Exhibition. If there was a tendency shown to imitate too servilely their leaders, both in style and treatment, on the part of the less experienced members, it is a less objectionable fault than firing off plates without aim or object, and trusting to luck for the results.

As might be expected from the geographical situation of the Society's home, a considerable proportion, if not a majority, of the landscape pictures were characteristic of the scenery of Essex and the eastern counties; and, although from that fact the Exhibition suffered a little from want of variety, it was impossible not to admire the spirit of appreciation common to many of the members of the atmospheric effects which constitute one of the principal charms of flat, marshy districts. But, while fully recognising the pictorial value of the mists and leaden skies, and commending the members for their success in treating their subjects under these aspects, we could not help feeling that we should like to see a little more of how the county looks under a genial sun, when the trees and hedges are clothed with verdure, the swamps dried up, and the roads not impassable to foot passengers.

We have mentioned that there is very little work that could be spared; but, on the other hand, so many of the members show work so nearly equal in merit that to choose any for special commendation is difficult. Among the pictures which particularly appealed to us were those by W. Rawlings, J. Carpenter, W. Selfe, Dr. Frank Jeffree, Dr. Roland Smith, J. J. Westcott, F. Palmer, W. A. J. Hensler, J. O. Grant, W. Fenton-Jones, L. S. Wilks, C. A. Russell, F. E. Roofe, and J. E. Hull.

The stereoscopic slides were all beyond the average and free from the usual technical defects. The Lantern Slides were a most admirable class. The Novelty Class, in which a silver medal was offered for the best original device in the way of apparatus, is always an interesting feature in the Hackney show. Here we found an ingenious plate-rocking contrivance actuated by a small electro-motor driven by a current from an ordinary *Leclanché* battery, exhibited by Mr. Ashton Gill; a tap attachment useful in washing negatives; and a carefully thought-out lantern slide making camera by Dr. Roland Smith, to which the medal was awarded. A collection of radiographs by Dr. Gerard Smith also was worthy of notice.

In the Open Classes, the General and Portrait Classes includedm any old acquaintances of those who visit Exhibitions. It will be sufficient to mention the principal exhibitors to convey a fairly accurate idea of the quality of the work. The Champion Class, for pictures which have previously received awards, was comparatively poor. It is curious that the Champion Class at Exhibitions should so often be weak; and, with regard to some of the pictures, one is tempted to wonder, if that obtained an award, what must the others have been like? The Lantern Slides Open Class contained some very fine examples; but the class, as a whole, was fairly beaten by the Members' Class. The total number was about the same in each.

The principal exhibitors in the Open Classes were Mrs. C. Wced Ward, W. Smedley Aston, Chas. M. Wane, W. J. Byroe, T. Morley Brook, C. F. Ioston, J. Bulbeck, P. S. Lankester, H. Mitchell, J. Gunston, H. W. Bennett, Mrs. W. Gardner, E. Seamell, Geo. Lafayette, J. H. Gear, W. Thomas, Edgar R. Bull, A. Brooker, J. T. French, and Willis Booth.

The body of the hall was, as usual, devoted to trade exhibitors, the principal stalls being held by Messrs. R. & J. Beck, of Cornhill; Henry Park, of Haggerston; T. H. Powell, of Denmark-hill; the Cresco-filma Company; the Prosser-Roberts Drug Stores, of Camberwell; Thorn & Hoddle, of Camberwell New-road; the Scientific Hand Camera Company, of Queen Victoria-street, who all had interesting displays of their well-known specialities; and Messrs. J. O. Grant & Cocks showed accumulators, induction coils, and other electrical apparatus used in connexion with X rays.

On each evening of the Exhibition the Society had provided for the amusement of its visitors, in addition to vocal and instrumental music and lantern exhibitions, demonstrations, at intervals, of the X rays, by Dr. Gerard Smith and Mr. J. E. Greenhill. The cinematoscope was also at work in an adjacent room. The general arrangements of the Exhibition were admirable, and Mr. Fenton-Jones and his colleagues deserve more than a passing word of praise for their completeness.

The Judges were Messrs. Thomas Fall, J. A. Hodges, and Rev. F. C. Lambert. In some cases the awards were very amusing examples of the eccentricity of genius.

List of Awards.

As under the regulations no member could take more than one award, when a member's name appears more than once, only the more valuable medal was actually received.

Members' Class A. (For Pictures taken since the last Exhibition).—Silver medal, *Marsh and Mead*, J. Carpenter. Bronze, *A Forest Pool*, W. A. Hensler. Certificate, *The Forest—Early Winter*, W. F. Fenton-Jones.

Class B. (For Pictures taken during membership).—Silver, *On the Grand Canal, Venice*, W. F. Fenton-Jones. Bronze, *Solitude*, F. E. Roofe. Certificate, *Family Gossip*, W. F. Fenton-Jones.

Class C. (Hand-camera Work).—Silver, *Ploughing*, F. E. Roofe. Bronze, *Derwentwater*, J. E. Hull.

Class D. (Stereoscopic).—Silver, A. D. Fort. Bronze, L. S. Wilks.

Class E. (Lantern Slides).—Silver, W. A. Hensler. Bronze, W. A. Hensler. Certificate, L. S. Wilks.

Novelty Class.—Silver, Dr. Roland Smith.

Open Classes.

Class F. (General Work)—Silver, *'Tis evening; all around is still; Save for the music of the bubbling rill*, J. Gunston. Bronze, *Ely, Organ Staircase*, J. Bulbeck. Bronze, *An Autumn Evening*, P. S. Lankester.

Class G. (Portraiture and *Genre*).—Silver withheld. Bronze, *At-home portrait*, P. S. Lankester.

Class H. (Champion).—*Silvery Morn*, J. H. Gear.

Class I. (Lantern Slides).—Silver, J. H. Gear. Bronze, A. Brooker. Certificate, E. R. Bull.

Technical Section.—Silver medal, Messrs. Thorn & Hoddle for acetylene gas generators.

The Inquirer.

**** *In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* Journal *useful and instructive.*

Re-exposure of Plates.—Hopeful asks: "Is it true that there is a reliable method by which plates that have been exposed to light, either in the camera or otherwise, can be restored to their original condition, and fitted for exposure? If so, it will be a great boon to others besides myself."

Coloured Screen for Landscape Work.—Exam. writes: "In an old work on photography, I find mention made, though in a rather indefinite manner, of a practice said to have been 'adopted by some workers' of using a green-glass screen before the lens when photographing landscapes or foliage. Is this plan any good? and, if so, must orthochromatic plates be used?"

Duration of Hand Exposure.—J. B. says: "I should like to elicit the opinions of readers of The British Journal of Photography as to the probable duration of the quickest exposure it is possible to give by uncapping the lens by hand. I have heard opinions expressed that vary so widely that I am at a loss to reconcile them. Of course, I am aware the time will vary with different manipulators, but what, in the case of an ordinary smart operator, is the probable hand exposure in taking a horse or dog, for instance?"

Ammonia in Gelatine Emulsions.—In reply to "Historicus," A B C writes: "I believe the first direct use of ammonia for the purpose of giving sensitiveness in gelatine emulsions was made by the late Dr. Van Monckhoven in 1879, from whom the idea was speedily taken up by English experimentalists. Dr. Monckhoven's process was described, I think, in the *Bulletin de l'Association Belge* in the early or middle part of 1879. But previous to that—in, I think, 1876—a leading article in The British Journal of Photography on Johnston's ammonio-nitrate collodion emulsion process gave a detailed account of experiments with ammonia in connexion with the then new gelatine emulsion." [See Mr. York's letter last week.]

Xyloidine.—(To "Ignorance.")—Xyloidine is the nitro substitution product prepared from starch by treatment with nitric acid, and is of practically no use for photographic purposes. Although soluble in ether and alcohol, it dries to a granular opsque film, useless for negative purposes. Celloidine is the name given to a commercial preparation of purified pyroxyline, which is apparently first dissolved, clarified, and neutralised, and finally solidified into cakes. It is usually supposed to be a pure and reliable form of pyroxyline. Papyroxyline, made from paper, has been considered to possess advantages in the direction of easy fluency and freedom from structure, but these qualities depend entirely upon the details of its manufacture.—Syntax.

Wooden Bath.—In reply to "Wet Plate," J. Barnes writes: "If the bath is a large one, the best and most satisfactory method will be to line with glass, the wooden casing having been previously well saturated with several coats of (not too thick) shellac varnish. Saturation with shellac, if properly done, also answers well for large baths without the glass lining, but for small ones paraffin wax is preferable. The method of application is to melt the wax in a suitable iron or other dish on a flat stove, raising the temperature as high as may be convenient, and then to immerse the bath or dish to be waterproofed, which should be previously thoroughly dried and warmed. As the wax penetrates, bubbles of air will escape from the wood, and the immersion should be continued until these have ceased, when the bath is taken out, allowed to cool, and the superfluous wax scraped off. Obviously, this plan cannot be applied to large sizes."

Conversion of Printing Bath.—(To J. Phillips).—"The conversion of the printing bath to negative purposes is a very simple matter, theoretically, as it is only necessary to get rid of the organic matter it contains and bring it to a suitable strength. The trouble involved will depend upon the extent to which it has been used. The first operation will be to boil it in a porcelain basin, allow it to cool, and then filter. Now add a few grains of carbonate of soda, together with a few drops of liquid ammonia, and let it be freely alkaline. Shake it up well in a clear glass bottle, and then place the dirty-looking mixture in strong daylight until it first blackens and then becomes clear, when it should be filtered and afterwards rendered very faintly acid with nitric acid. It may be necessary to repeat the 'sunning' process where the bath has been very foul. The only method of adjusting the strength is by quantitative analysis; 'argentometers,' so called, are of no use, as they are unable to ignore the soluble nitrates, other than that of silver, invariably contained in an old bath."

Our Editorial Table.

Handbuch der Chemigraphie.

By Wilhelm F. Toifel.

A. Hartleben, Vienna, Pesth, Leipsic.

This volume forms one of the series of Hartleben's Chemico-technical Library, and is the second edition of the work. It deals with the processes of etching in relief in their many varieties, upon zinc, copper, and other metals, for letterpress. Those who wish for information concerning the production of line and screen plates will find this a very handy volume, as the author not only gives full information with regard to materials and manipulations, but has brought the work up to date.

THE PARADE: 1897. AN ILLUSTRATED GIFT-BOOK FOR BOYS AND GIRLS.

Edited by GLEESON WHITE. London: H. Henry & Co., Limited, 93, St. Martin's-lane, W.C.

THE boys and girls for whom, in this beautiful book, Mr. Gleeson White and Messrs. Henry have set themselves the pleasant task of catering are fortunate in respect of the artists and authors who have endeavoured to interest them, for of both kinds of workers some of the ablest of the day contribute to *The Parade*. Until very recent times "annual" literature for young people was usually either mawkish or namby-pamby, while it assumed on the part of its readers not merely tenderness of years, but intellectual feebleness and stupidity. Mr. Gleeson White and Messrs. Henry wisely recognise that there is a large class of young people who ask for and are capable of appreciating different literary fare to that usually vouchsafed to them by the Tract Society and similar bodies, and the result is this tasteful, sprightly, and interesting book, in which, if we mistake not, oldsters as well as youngsters will take delight.

AMONG the authors are John Oliver Hobbes, R. Le Gallienne, Barry Pain (with one of his inimitable school tales), Max Pemberton, F. Norreys Connell, Mrs. Molesworth, and many others, who, between them, contribute brightly written tales, poetry, music, &c., while, of the pictures, Aubrey Beardsley, Alan Wright, L. Housman, Starr Wood, N. Jungman, H. T. de Mattos, and numerous other clever people claim the authorship. Carefully edited, beautifully bound and printed, it may with safety be predicted that a wide welcome awaits the *Parade* for 1897. At any rate, it deserves it.

MESSRS. HENRY & Co. also send us *The Happy Owls*, told, drawn, and lithographed by Th. Van Hoztema. This consists of a series of humorous illustrations (in colours), showing how two stolid owls surprised others of the feathered creation by being happy without fighting or excessive eating and drinking.

The Tyrants of Kool-Sim, by J. Maclaren Cobban, a stirring and absorbing tale of adventure, and two of Mary E. Mann's charming and idyllic stories, *There was once a Prince* and *When Arnold Comes Home*, are among Messrs. Henry's recent fictional publications. The two former have already achieved popularity, and all may be safely placed in the hands of that awe-inspiring product of propriety, the young lady of fifteen.

THE ACTION OF LIGHT IN PHOTOGRAPHY.

By Captain ABNEY, C.B., D.C.L., F.R.S. London: Sampson Low & Co., Fetter-lane, E.C.

THE full title of this work is *Evening Talks at the Camera Club on the Action of Light in Photography*, by the President, Captain Abney, C.B., D.C.L., F.R.S., which might, we think, have been abbreviated to the extent indicated by the heading of this notice. The book consists of a series of chapters that treat, separately, many of the phenomena of light in its photographic action. Thus, molecular and atomic motions; spectrum wave-lengths; absorption spectra; light in the dark room; and halation, are among the subjects dealt with that are of immediate interest to practical photographers, many of whom, however, will, no doubt, find it convenient to pass over some chapters that we have not mentioned. Photometry—or, as it is more correctly expressed—the measurement of opacities, and colour measurement and luminosity, are also among the sections of the book, wherein the action of heat and cold, intermittence of exposure, and very intense light on sensitive surfaces, likewise receive detailed reference.

If there is not anything absolutely new or novel in Captain Abney's book, it is replete with interest to those given to the study of the theory of photography, while even "the photographer who," to quote from the preface, "as a rule is not too fond of the theoretical considerations that underlie his craft" will find in it much to instruct and something to fascinate him. In connexion with recent articles and discussions that have appeared in our columns, it is of interest to note that Captain Abney appears to favour the sub-salt theory of development. There are seventy illustrations and an appendix of tabular matter relating to experimental results in the book, which should find a place in the library of all interested in the scientific aspects of photography.

MESSRS. ARTHUR & Co., of 19, Thurnham-street, Rocky-lane, Liverpool, send us samples of their A1 retouching medium and negative varnish. Both preparations appear to be admirably adapted for their respective purposes. By the use of both it is claimed that plenty of work can be got on the film, and it does not come off with the varnishing.

News and Notes.

ERRATUM.—In the leaderette on *Rapid Printing*, p. 739 of the JOURNAL for last week, for "centimetres" read "millimetres."

PHOTOGRAPHS OF GARDENS AND PLANTS.—Prizes to the amount of nearly 160*l.* have just been paid to the various competitors in the 1896 competition by the Editor of *The Garden* and *Gardening Illustrated*. The same series of prizes will be offered during the coming year.

PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, December 2. *Carbon Printing without Transfer*, a demonstration by Mr. James A. Sinclair. Visitors are welcome.

MR. ARTHUR C. BALDWIN, who is known to very many of our readers in London and the country, informs us of the termination of his engagement with the Eastman Photographic Materials Company. Mr. Baldwin, we believe, proposes engaging in business on his own account, and will have the best wishes of his many friends for his success.

MR. W. R. BLAND of Duffield, Derby writes: "There is a vacancy in the membership of the POSTAL CAMERA CLUB. Albums circulate monthly with regularity. The Club has members who are exhibitors at the Royal Photographic Society, and the Salon, and other leading shows, and therefore advanced workers only are requested to reply. A copy of the rules of the club will be forwarded on application to me."

Patent News.

THE following applications for Patents were made between November 11 and November 18, 1896:—

GAS JET FOR LANTERNS.—No. 25,085. "Improvements in a Gas-jet Arrangement for Optical Lanterns." G. HOLDSWORTH.

ENLARGING LANTERNS.—No. 25,086. "Improvements in Lanterns used for Making Photographic Enlargements, Reductions, or Copies." G. HOLDSWORTH.

CAMERA STANDS.—No. 25,136. "Improvements in and relating to Photographic Camera Stands." W. W. BEASLEY and C. PERROTT-SMITH.

SCREEN KINETOSCOPY.—No. 25,278. "Improvements in Apparatus for Taking and Exhibiting Animated Photographs." J. ADAMS, E. HOLLANDERS, and C. J. LEATHER.

PRINTING FRAMES.—No. 25,579. "Improvements in Photographic Printing Frames." C. A. MCEVOY.

SHUTTER.—No. 25,616. "An Improved Photographic Shutter." Complete specification. A. T. KYBERD.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
30	Bradford	Lectrettes by Six Members.
30	Camera Club	*To Lyonesse with a Camera.* Rev. J. Courtney Gale.
30	North Middlesex	Annual Exhibition (*Conversazione*).
30	Richmond	*Practical Pictorial Photography.* A. Horsley Hinton.
30	Rotherham	Imperial Company's Competition Closes.
December.		
1	Gospel Oak	Home-made and Novel Apparatus.
1	Hackney	*The Evolution of the Gelatine Plate.* A. Mackie.
1	Halifax Camera Club	*Holiday Tour in Northern Italy. Gems of Photography.* Thomas Widdop.
1	Isle of Thanet	*Lantern-slide Making.* John A. Hodges.
1	Lewisham	*Stereoscopic Photography.* Professor Carlton J. Lambert, M.A., F.R.A.S.
1, 2	North Middlesex	Annual Exhibition.
1	Rotherham	*Vertical Projection.* J. Leadbeater.
1	Wolverhampton	*In the Wilds of Norway.* T. H. Cox.
2	Borough Polytechnic	*Paper Negatives.* P. C. Cornford.
2	Croydon Camera Club	*Moving Pictures, &c.* W. Friese Greene.
2	Leeds Camera Club	*Ancient versus Modern Printing, Toning, and Washing.* Mr. Gaunt.
2	Photographic Club	*Carbon Printing without Transfer.* J. A. Sinclair.
3	Camera Club	H. Brereton Baker.
3	Leeds Photo. Society	Annual Meeting and Members' Lantern Evening.
3	Leigh	*The Hand Camera.* M. F. Burrows, J.P.
3	Liverpool Amateur	*Intensification and Reduction.* F. Anyon.
3	London and Provincial	*Colour Filters.* E. J. Wall.
3	Oldham	*Stereoscopic Photography.* W. Schofield.
3	West Surrey	Social Night.
3	Woodford	*Hand-camera Work.* W. Thomas.
5	Southport	Exhibition of Slides.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 19,—Mr. P Everitt in the chair.

Mr. F. Goddaer was proposed for membership.

The HON. SECRETARY referred to the paper recently read dealing with the present position of the Jackson-Harmsworth Arctic Expedition, and said he had been enabled to show prints of the original negatives illustrating the meeting of Jackson and Nansen and other features of the country.

Mr. LEWIS MEDLAND showed a selection of slides of Great Yarmouth and its neighbourhood, anticipating the visit of the Photographic Convention arranged for next year. He showed that there was an abundance of material in the district, embracing sea and landscapes, shipping, and places of antiquarian interest, taking his audience over the probable routes of the excursions, including a trip to Norwich and the Broads. He concluded with some views in and near Southwold, in all some 140 slides, by the collodio-bromide process, being thrown on the screen. Slides by the Chairman, Mr. Bayston, Mr. Hill, and Mr. Wiss were also exhibited on the screen.

The CHAIRMAN in proposing a vote of thanks to Mr. Medland said he was sure that, if the Convention got as far as Southwold, they would agree with him that it was well worthy of a visit.

PHOTOGRAPHIC CLUB.

NOVEMBER 18,—Mr. R. P. Drage in the chair.

Two new members were proposed, viz., Mr. George Hana and Mr. George J. Wright.

Mr. SNOWDEN WARD said that he had just had a conversation with an assessor of risks for the Westminster Fire Office. This official stated, but in an unofficial manner, as he explained that there was no office regulation upon the subject yet, that his office had not placed any restrictions upon the proper use of acetylene, and he did not think they would do so; but he suggested that the best course for any photographer who intended to use the new illuminant would be to write the Westminster Fire Office, stating his intention, the quantity of gas he was likely to make, the quantity of carbide he should use, the method of storage, and, lastly, the kind and size of generator he should employ. Mr. Ward said he believed that the Westminster Fire Office and the Sun Office were the pioneers in dealing with the individual risks of photographers.

The Paget Prize Plate Company sent a number of packets of their lantern plates, both slow and rapid series, for distribution amongst the members, who were asked to try them and bring their results to a future meeting. They also sent a gratuitous supply of their book called, *Paget Lantern Slides; a Manual for their Use*, which contains full instructions for making slides both by contact and in the camera.

Mr. THOMAS FALL gave his lecture entitled,

BIRDS AND ANIMAL LIFE.

The dissertation was illustrated by a number of very excellent slides of dogs, birds, and horses. Mr. Fall related a series of experiences with animals, and anecdotes about them, which revealed him to his audience as an enthusiastic lover of the animal world.

On December 2, Mr. James A. Sinclair will demonstrate the *Artigue Method of Carbon Printing without Transfer.*

MANCHESTER PHOTOGRAPHIC SOCIETY.

NOVEMBER 12,—the President (Mr. T. Chilton) in the chair.

Mr. B. J. Beckton was elected a member.

Mr. H M. WHITEFIELD exhibited the apparatus used in the generation of acetylene gas, and gave a description of the process, afterwards demonstrating the manufacture of the gas, and using it in the optical lantern. Slides by Mr. H. V. Lawes from hand-camera negatives were shown by aid of the new light. The disc was six feet in diameter and for the size well illuminated. The apparatus was kindly lent by Mr. J. T. Chapman.

Messrs. A. E. CASSON and HARRY WADE gave their experiences on Wellington & Ward's new negative paper, showing results from personal work with the paper. Considering the bad weather that has prevailed during the past few weeks, the work was satisfactory, although it was proved by many exposures that the light at this time of the year was too dull for successful work on this paper, which requires a longer exposure than glass plates. The makers sent down for inspection negatives which proved that negatives equalling glass plates can be obtained, and future meetings should see results by the members from the packets distributed.

Croydon Camera Club.—November 18.—No more profitable lecture has been given at the Club than the truly admirable discourse upon

PICTURE-MAKING WITH THE CAMERA,

with which Mr. HORSLEY HINTON regaled a crowded attendance of members on Wednesday, November 18. As a rule, the subject of art is, in the eyes of the average man, a sufficiently forbidding one. Hence it says much for the attractive force of Mr. Hinton's name and talents that, in the first place, he should have drawn a full house, and, in the second, held his auditors' close attention whilst he for over an hour talked to them of pictorial art and its expression by means mainly, but not entirely, photographic. Had not the President of the Club, in introducing Mr. Horsley Hinton, said so, surely no photographer would be likely to forget that the lecturer is one of the foremost exponents upon the exhibition walls of the pictorial possibilities of landscape depicted with a camera. We are unable to even summarise most of the points spoken on; it must here suffice that Mr. Hinton dwelt with much emphasis and persistence upon the difference between using the camera as a kind of recording angel of natural truths and employing it for the attainment of an ideal expression of some mood, moment, or passage of nature, which the artist-photographer seeks to fashion into a decorative and personal statement. The lecturer proceeded, at much detail, to explain some of the means whereby he made the camera and photographic materials respond to his wishes. A palpable hit was, that the power of personal control was valueless, or nearly so, unless the photographer knew what modifications or alterations were conducive to the artistic betterment of the photograph. In this regard Mr. Hinton dwelt upon the great value of simplicity and singleness of purpose, inasmuch as the prevailing or natural tendency in photography is in the direction of pictorial verbosity—too many facts crying out for recognition. The lecturer's remarks gained much point by a selection of his large platinotype landscape studies, which were exhibited at the Photographic Salon. Two of these, *Flowery Wastes* and *Sweet Wilderness*, were employed to show how a full daylight scene may be so photographically sophisticated as to give the impression of grey evening. In discussing the foregoing, the President (Mr. Hector Maclean) made a series of half-humorous, but occasionally serious, remarks respecting what had gone before. He began by quoting Ruskin's aphorism, "Life without industry is guilt, and industry without art is brutality," and proceeded to plunge into a maze of friendly criticism. The suppression of detail of which many leading photographers are so fond was, he maintained, a confession of weakness, a confession that selective sharpness of focus and partial suppression of detail are beyond the present means of control. Not only are "familiar objects" welcome and helpful in a composition, but fine detail is not incompatible with the higher forms of art, as witness Brett or Meissonier. "Change their pictures into the smudgy shadowings of George Davison, and they would be absolutely valueless either from the art or any other standpoint". Mr. Maclean was also somewhat fervid upon photographic falsifications. He drew a distinction between alteration and falsification — between saying less or emphasising more, and making night of afternoon. To transpose nature into the keys of art is one thing, but to depict the sun as a moon is not a transposition, but a pictorial imposture. He wound up with some impressive words, urging that the "vehicles of expression," "light, shadow, and atmosphere," were not the end, but the beginning, of a great picture. Mr. HINTON having briefly replied, in consequence of being obliged to catch a train to Guildford, the meeting accorded him a loudly expressed vote of thanks. Mr. Adolph Laugier was elected a member, and several other names handed in. Mr. Kough exhibited three interesting and well-executed snap-shots of motor cars passing through Croydon on the occasion of the memorable motor-car parade to Brighton.

Putney Photographic Society.—A meeting of the Society was held on November 4, Mr. H. Faulkner in the chair.—A set of American slides had been lent by the Royal Photographic Society, and these were passed through the lantern. The set includes some very beautiful slides, which were much appreciated by the members.

Richmond Camera Club.—November 16.—Mr. ARDASEER gave the first of a series of elementary lectures which have been arranged for the session, his subject being

MAKING A NEGATIVE.

He remarked that this was a large order for one evening, but gave many practical hints as to apparatus, exposure, development, &c. At the same meeting Mr. Gibson showed some enlargements on bromide paper made without a condenser, the illuminant being magnesium ribbon, of which only six or eight inches were used for an exposure when enlarging to two diameters, ground glass being placed behind the negative, and the burning ribbon moved across and across, so as to cover the whole surface as evenly as possible.

Woolwich Photographic Society.—November 11, Colonel C. D. Davies presiding.—The Rev. F. C. LAMBERT delivered his second lecture on the

PRINCIPLES OF PICTURE-MAKING,

dealing with the arrangement of light and shade. He pointed out that there must be a principal light and a principal shadow. The strength of a picture depended upon its shadows. Shade was really an absence of light. It had been estimated that in nature there was a difference of from 1700° to 1800° between the darkest cavern and the whitest snow, but our whitest paper and our blackest platinum had only a range of about 350°, it was therefore impossible to accurately represent nature—we must give and take. The Rembrandt School sacrificed the high lights so as to give the shadows their full range. Turner's method was the reverse of this. To place the darkest dark against the lightest light was a favourite method, and gave strength, but was against breadth in a picture. At the conclusion, Mr. Lambert had projected upon the screen some splendid slides, which he analysed to illustrate and emphasise his remarks.

Darwen Photographic Association.—November 12, the Rev. Henry Irving occupied the chair.—The subject was

PLATINUM TONING,

by Mr. F. FIELDING, of Blackburn. The lecture, which was thoroughly entertaining and instructive, was enjoyed by all present. Mr. Fielding toned about twenty-four prints gelatino-chloride and collodio-chloride, the latter being superior in every respect, besides being, as the lecturer said, much easier to work.

Easthourne Photographic Society.—November 16, a pleasantly chatty lecture on

LANTERN SLIDE-MAKING

was delivered by Mr. ALGERNON BROOKER, of Hastings, on the part of the Britannia Works Company, Ilford. He said that negatives for this purpose should be very soft and full of detail, anything like chalkiness or intense contrast was to be carefully avoided. With a view to getting the best kind of negative, the use of isochromatic plates was strongly recommended. Backing plates, both in taking the negatives and also for obtaining the very finest results for lantern positives, was also desirable. He said that he mainly confined his exposure to Ilford lantern plates, and specially noted the effects which were to be obtained on Alpha plates with their great range of tone. An interesting feature of the demonstration was the screen exhibition of some results obtained by an ingenious method of local toning devised by Mr. Brooker himself, in.

which the special qualities of Alpha plates in giving various colours were taken advantage of to produce an effect closely resembling the natural colours of the objects photographed. This process, applied to flower work, gave some startlingly naturalistic results. The lecturer's remarks were pointed by examples of what to avoid as well as those to copy, also by instructions as to the method of improving and getting the best out of a given negative. Altogether the lecture was as instructive as entertaining, and an attentive audience testified their appreciation by a unanimous expression of approval.

Halifax Camera Club.—November 11.—Mr. Alexander Keighley gave a lecture on

ART IN PHOTOGRAPHY.

The lecture was illustrated by numerous lantern slides of the very best work and of many sketches made by the lecturer to explain the various points of what to do, and what not to do. Two men with cameras go to the same scene, one of them returns with more than a photograph, a picture, full of poetry and artistic composition, proper lighting, and with a suitable figure to give it life; the other, being of a more mechanical mind, returns with a photograph, through no fault of the camera or mechanical knowledge, but merely ignorance of the laws of art or of perception, the figures unsuitable and badly placed. To sum it up, it is this: That one is an artist with an artistic perception; the other has commonplace ideas, possibly through not being trained. In the first place, one must know how to handle his tools, and be able to produce a technically excellent negative, and, having such negative, be able to produce any effect on the finished print. After this, he must train his mind to create artistic pictures, study the works of the great workers, and, by constant examination of them, learn what is required. Artists have, by lives of study, framed certain general rules which can be acted upon, and must be borne in mind, and the observance of which experience has taught them are the necessities of real art. A photographer may just as readily expect to be able to produce artistic photographs without diligent study and experience as if he brought an easel and a box of paints and set out to paint a masterpiece. Fitness of details is a point which is too frequently overlooked. A fashionably dressed lady hardly agrees with the surroundings of a fishing scene; and, again, the figures should possess diversity of occupation and activity, and at any cost avoid uniformity. Uniformity should be avoided in landscape, roads, and buildings, as well as in figures, and the principal object should never be in the centre, with, say, objects of equal height on each side. By turning to an angle, the central figure or building is improved, whilst the natural perspective relieves the monotony of the side objects. Straight lines should be in some way broken up, or the attention directed from them, by the introduction of a prominent object. Too many perpendicular or horizontal lines ruin a picture. The chief lines should also balance; if all running in one direction, the impression of instability is given, and the picture appears as if falling. The balance of objects is of great importance. A principal figure should, if possible, be supported by a secondary object not equal in prominence or occupying so important a place in the picture; neither should the principal object occupy the centre of the picture, a position about a third of the length from either end gives the strongest point. As well as applying to objects, this also governs the placing of the high and low lights of the picture, although more freedom is allowed in this respect. The arrangement of grouping in a picture by any eminent artist, although containing a great number of figures, is not done in any hap-hazard manner, but is based on geometrical form, as also are, in many cases, the accessories. The form of a pyramid or diamond (with the axes diagonal, not perpendicular), or even of an arc of a circle, or with the principal lines radial, may be used. Greater prominence can be given to a comparatively small object by causing the lines of a picture to converge towards it. Beauty of form exists in varying degrees of beauty, in different shapes, in proportion to their possible variety; thus, a square has but one shape, and possesses but small beauty; an oblong or an oval gives more variety; whilst the egg shape gives almost an infinity of combinations. If a picture of a human body be taken, it will be found to consist almost entirely of the egg-shaped lines, and to be the most beautiful of any possible picture. In the same way, in landscape, the perspective, consisting of the curved lines, is most pleasing to the eye, such as the winding of a road or river. The lines of a picture should lead up to the point of interest, which should not have a distant feature immediately behind it, otherwise the feeling of atmosphere is lost. How much to include is one of the greatest errors made in photography, and there are few prints which would not be improved by judicious trimming. Have a principal object, and give it just sufficient prominence, taking care that the light and shade, as well as the object, balance. The position of the light is a subject of great importance, and one about which few rules can be laid down; the artistic perception must be brought to play on each individual case. The balance of effect, choice of effect, time of day, are all points in which rules are impossible, except to observe the precepts briefly mentioned above. The lecturer concluded by saying that photography was now recognised by critics and artists to give ample scope for the exercise of some of the highest powers with which man is endowed. The production of more excellent apparatus gives one more time for forethought and careful consideration, as it is in every way as necessary for the photographer as for the artist to think out each individual subject.

Leeds Photographical Society.—At the ordinary monthly meeting a very pleasant evening was spent, when the Rev. J. BEANLAND gave his lecture on

PLATINUM WORKING.

Some beautiful specimens of printing in platinotype were shown by Mr. Richard Keene, of Burton-on-Trent, who, it will be remembered, took several photographs of Temple Newsam during the visit of their Royal Highnesses, the Duke and Duchess of York. Most remarkable amongst them were those of the grand staircase and corridor, fireplace, great hall, Darnley Room, blue drawing-room, view of the gardens from the terraces, the picture gallery, arranged as a dining-room, and the photograph of the house party. The Platinotype Company also forwarded some special prints to illustrate the subject of the lecture, as well as several exposed samples of paper, which were satisfactorily developed (hot-bath process) by Mr. Beanland in the presence of his audience. One item in the syllabus for Tuesday evening had to be omitted, owing to Mr. Bourdes' ill health; but the gap was very ably filled by Mr. S. D. MCKELLEN, of Manchester, who was visiting our city, with some of his latest productions in the way of

PHOTOGRAPHIC APPARATUS.

He pointed out the good points of a half-plate camera and three hand cameras, giving at the same time an historical account of the various patents taken out since 1883. He said the Automatic Magazine Hand Camera, which combines simplicity of mechanism with absolute infallibility in working, allows a dozen glass plates in sheaths, or two dozen cut films in sheaths, to be used at pleasure without changing the mechanism, removes the exposed plate or film, lays it down in the receiver, grips it so that it cannot shake about, and places the next plate or film in correct position for exposure. An indicator records how many plates have been exposed, all with the simple turn of a key, and with absolute certainty. The changing movement, which is performed in a moment, is independent of the position of the camera, it may be pointed upwards or inclined downwards, the plates may be changed all the same. Here the infallibility of the apparatus comes in. Gravitation has little to do with it. Nothing has to be thought about but the simple turning of the key completely round. He also informed his audience that a new feeder had just been invented and patented by Mr. Abel Heywood, of Manchester, consisting of a sight piece with a sight hole, which stands at the back on the top of camera in such a position that it will be easy to place the eye to the hole. A wire frame the exact size of the sensitive plate is placed at the top of the camera, the distance from the sight piece being the same as the length of focus of the lens. In use, the camera is held against the chest or shoulder, and the eye placed close to the sight hole, everything then seen through the frame will be in the photograph. In this position the picture is taken from the natural elevation, and much truer perspective is obtained than when the camera is held with the eye looking down upon it, as with the reflecting feeders. When the picture is secured, the eyepiece and frame are folded down out of the way. A ground-glass focusing screen is rendered absolutely unnecessary, even with stand cameras. At leisure, some time when not photographing, the camera is set up in the ordinary way on its legs, with lens complete. The correct focus is found on the ground glass for the nearest distances by the ordinary rack-and-pinion work. A line or pointer is marked on the travelling rail, and a corresponding line on the baseboard exactly opposite the pointer line, as before. As many of these scales are marked as there are lenses in use with the camera. When the camera is set up at any future time, and the pointer racked to any of the marks, and the proper lens inserted, it will be correctly focussed for the distance indicated by the pointer. By the use of the Heywood finder, the composition of the picture can be viewed through the frame in a much better manner than on ground glass, and the focussing cloth is done away with. Besides all this, the dark side may be inserted in its place ready for the exposure the instant the proper position of the camera is obtained. This finder is also made in pocket form to erect on the camera body when required, and when not in use can be detached and folded up. At the close of this display of apparatus, Mr. Godfrey Bingley showed, by means of the lime light, with Mr. A. W. Atkinson's assistance, a number of slides taken during the Convention week, these being the work of Mrs. C. W. Ward and Messrs. Fall, F. W. Hindley, Scorer, and W. D. Welford. Several members brought specimens of their own work for trial in the optical lantern. The PRESIDENT (Mr. P. Gilston) gave some wholesome advice to hand-camera workers, who, he suggested, sometimes presented their photographic apparatus and took advantage of "friend and foe" alike in undesirable postures. A little practice of the golden rule would prevent a little friction at times. The proceedings were brought to a close by a vote of thanks to Mrs. C. W. Ward, Mr. McKellen, and the other gentlemen for their able contributions to the evening's enjoyment. Arrangements were made to hold a competitive Exhibition of members' work in the Leeds Mechanics' Institute on January 19. The meeting was well attended, but details of the Exhibition arrangements will be forwarded to absentee members in due course.

Liverpool Amateur Photographic Association. — November 19.—Mr. GEORGE E. THOMPSON delivered his new lantern lecture,

THROUGH BARCELONA TO MAJORCA.

The lecturer's discourse consisted of an unaffected and sprightly narrative of a recent visit to Majorca, "the fairest island of the Mediterranean," and to Iviza, another of the Balearic group. The places described included Palma, the capital, which is rich in architectural antiquities; Manacor and the great Stalactite Cavern of Arta; the Monastery of Valdemosa, with its memories of Georges Sand and Chopin; Miramir and the Archduke Ludvig's residence, and Soller, with its romantic surroundings. The series of photographs illustrating these rambles was generally pronounced to be the finest Mr. Thompson has shown, and the lecture was received with enthusiasm by a crowded room, a vote of thanks proposed by the Association's PRESIDENT (Mr. J. Sirrett Brown) being carried by acclamation.

Plymouth Photographic Society.—November 13.—The Society was greatly interested and instructed by an exposition and demonstration of the Röntgen or X rays by Staff-Sergeant Bruce, of the Medical Staff Corps.—The President. (Mr. E. H. Micklewood) having alluded to the mingled surprise and incredulity with which the early announcements that it had been discovered how to photograph the bones of a living person were received, and having sketched the present position of X-ray photography, Mr. Bruce proceeded to give a concise history of the discovery and of the steps which led thereto, in which, as he pointed out, our own countryman, Professor Crookes, the inventor of the special vacuum tube which is used, has no small share. Mr. Bruce also described the action of the apparatus he had with him, demonstrating in a very satisfactory manner the action of the electric current in vacuum of various degrees, and of the changes incident to different chemical vapours replacing air in the tubes. He then, by means of lantern slides thrown on the screen, showed a variety of pictures, radiographed hands, feet, and other subjects, showing that under the influence of the X rays the organic parts viz., the flesh, muscle, &c., practically become transparent, leaving the inorganic bones only to resist the passage of

the rays. Mr. Bruce then demonstrated the process by taking radiographs of the President's left hand and Mr. J. T. Trend's right wrist, the former having had the top joint of the middle finger destroyed by passing between cogged wheels, and the latter an imperfectly set broken wrist. These radiographs, having been developed by Mr. Micklewood, very clearly showed the abnormal condition of the bones. The results were most successful, as might have been expected, for Mr. Bruce has a most splendid set of apparatus, which worked without a hitch. Mr. Bruce concluded a highly interesting and successful demonstration by exhibiting the wonders of the radioscope, an instrument by means of which one can at once see the condition of the bones when not too deeply imbedded, and can literally see the bones of one's hand, even through a book two inches thick. The object to be examined is held near the excited Crookes' tube, and the radioscope applied to that, and now, on looking into it, the bones, or, in the case of a purse with money, keys, &c., only the inorganic objects seem to be left; and, as the lecturer pointed out, such an instrument could be of immense service to the surgeon on the field of battle in enabling him to at once determine the position of a bullet. On the motion of Mr. J. D. Turney, seconded by the Chairman, Sergeant Bruce was heartily thanked for his lecture and demonstration.

FORTHCOMING EXHIBITIONS.

1896.	
Nov. 27	Romford and District Photographic Society. A. John Ormiston, 4, Laurie-square, Romford.
,, 30–Dec. 1, 2 ...	North Middlesex Photographic Society.
December 3, 4.....	Aintree Photographic Society. E. P. Heron, 2 Tilney-street, Orrell Park, Aintree, Liverpool.
,, 29–Jan. 2.	Borough Polytechnic Photographic Society. P. C. Cornford, 103, Borough-road, S.E.
Dec. 1896–Jan. 1897	Bristol International. Hon. Secretary, 20, Berkeley-square Clifton, Bristol.
1897.	
January 14, 15	Weymouth and District Camera Club. E. C. Bennett, 10, Newberry-terrace, Weymouth.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

ACETYLENE.

To the Editors.

Gentlemen,—As there has been much abuse of the explosive properties of acetylene, perhaps a few plain facts put before your readers will help them to form a fair opinion.

Perhaps you will allow me to quote a little of my experience. I have been connected with this gas in America for the last three years, therefore I may be able to prove that acetylene is not the dangerous compound your correspondent would have your readers believe. Your correspondent claims acetylene to be liable to spontaneous explosion; such is not the case, neither will it explode by the generator receiving a shock. This will prove it. I filled an iron ball with acetylene to a pressure of five pounds to the square inch, and then subjected it to a series of blows from a large sledge-hammer. Although the ball was bent all shapes, there was no explosion, neither has there ever been to my knowledge through this cause. Acetylene has a chemical action on *pure copper*, but none of a dangerous kind on brass. Series of experiments have been conducted by me before the Chemical Society of New York, and they all go to prove this. Several insurance companies in England are at present willing to insure houses, &c., lighted by acetylene, and, no doubt, in a short time, all will do so. I may add there were last year 730 people using acetylene as a general illuminant in New York, and that only three accidents occurred—two through escapes and one through a generator being charged with a candle close by, conditions under which coal gas would have acted just the same. Explosions are often caused by the generator having no back pressure valve; if this is not fitted, when the carbide is exhausted and the pressure gone, the lights are liable to fire back to the gas-holder and explode same. No generator should be purchased without such a valve. The recent explosion at Grimsby was from this cause. Acetylene gas is far healthier to burn than ordinary coal gas, and, when inhaled, its effect on the human body and the lower animals is far less dangerous than coal gas.

In conclusion, allow me to request your readers to make a practical test, and I am sure they will agree with me that acetylene is an ideal illuminant both for general and photographic purposes, and under proper conditions just as safe as coal gas.—I am, yours, &c.,

Putney, November 18, 1896. Percival C. Frewin, F.C.S. U.S.A.

THE PHOTOGRAPHIC SALON.

To the Editors.

Gentlemen,—Nothing could be more regrettable than the excessively offensive personal tone that Mr. Horsley Hinton has chosen to adopt in replying to my letter in your issue of the 6th instant. The increasing absence of courtesy in social intercourse is one of the most lamentable features of modern times; from a certain class we expect nothing better, but that a man in Mr. Horsley Hinton's position—the Editor of a paper that from the nature of its object, circulates of necessity amongst those of refined tastes—should descend to such expressions as a "pure fabrication," "not very reputable performance," in addition to others almost equally objectionable, is in the highest degree regrettable. It should rather have been his aim to have kept the pages of the artistic and technical press as refined in tone as possible. Nothing can be gained by the introduction of insulting personalities into a discussion; it advances no principle, but, on the contrary, indefinitely retards it, by diverting attention from the original theme of the debate, and ultimately losing it altogether in the ever-increasing bitterness of the personal attack. My letter contained no personal attack of any kind; and, having no wish to follow the undesirable example of Mr. Horsley Hinton in replying, I can ignore the intentional discourtesy, I hope, and reply to the subject-matter in detail. Since, however, the statements in my previous letter are supported from the Salon catalogue, and *Mr. Horsley Hinton's own writings during the last six or seven weeks*, I can fairly claim that he should at least withdraw the worst expressions in his letter, the "pure fabrication" and the "not very reputable performance."

In the first place, Mr. Horsley Hinton devotes just a third of a column in contesting a statement that he attributes to me (see the first four lines of his letter), that the Salon Committee send "invitations to contribute" and "then do not accept what is sent in," ending with the words, "If, therefore, Mr. Bennett or any one else says an 'invitation to contribute' was sent, that statement is untrue." *Now, this is just what I did not say*, as a reference to my letter will show. I was careful to use the expression "send in," this being taken from an editorial note to Mr. Oliver's letter in the *Amateur Photographer*, October 9, 1896, p. 290.

"NO ONE IS INVITED TO EXHIBIT at the Photographic Salon, he may have been asked to *send in*. Ed. *A. P.*"

And I am justified in attributing to Mr. Horsley Hinton the editorial articles and notes that appear in that paper; since his name is printed on the first page of each number as Editor, he is responsible for them. What is gained by misquoting a letter in order to refute the misquotation? I notice that Mr. Alfred Maskell adopts a similar method in the latter part of the third paragraph of his letter replying to Mr. Evans; it certainly conveys the impression that the writers find the original statements indisputable. But, although the statement that I did not make is said to be untrue, I am asked to point to any single word or sentence in the Salon prospectus that even implies an "invitation to contribute;" though, after all, is it not a mere quibble to attempt to discriminate in this manner between an "invitation to send in" and "an invitation to contribute," or an "invitation to exhibit?" The third paragraph of the familiar prospectus which is sent out as an invitation each year refers to the photographs "sent in" as "*pictures entered for exhibition;*" naturally, what else are they sent in for? This prospectus is unquestionably an invitation to its recipients to contribute their best work to the coming exhibition, and whatever else he may call it, the interesting fact remains. In saying that I protest against the "unfairness of the Committee in sending invitations . . . . and then not accepting what is sent in," he ignores or misunderstands the whole import of my letter. The only inference to be drawn from the prospectus is, that a selection will be made from the works contributed *on their merits alone, irrespective of whom the sender may be;* and my contention is that this is certainly not the case, and that the disproportion existing between the number of works exhibited individually by members of the charmed circle and non-members respectively, is no criterion of their relative merits. This does not necessitate "rascality," as Mr. Horsley Hinton assumes, but I admit that in one sense it implies incompetence to judge or select; for no man can be competent to decide between his own and his rival's work. Mr. Horsley Hinton argues that the Committee is composed largely of men of recognised ability—a point that I have never questioned; but, while he holds the opinion that really able men are only to be found in the Linked Ring, I would contend that very many fully equal exist outside this magic circle.

"Its own members include most, if not all, of the best men."—*Amateur Photographer*, September 25, 1896, p. 247.

The "Links" form one section of the photographic world only, and not, as Mr. Horsley Hinton would have us believe, the whole of it. He says that they are asked to "judge, lecture, write, and exhibit," as a proof of the current estimate of their ability. As a matter of fact the majority of the judges at exhibitions announced at the present time are not members of the "Ring," while not one in ten of the lectures at the leading photographic societies is given by a "Link."

It is this assumed superiority over all other photographic workers so frequently and so aggressively asserted, coupled with the fact that it consists mostly of men whose views and methods of working run very much in the same groove, that condemns the Linked Ring as a final or standard authority when works of varying character are competing for premier honours. In comparing their own with their rivals' work, they invariably judge their own to be far superior, though their decisions are frequently reversed by other competent but less prejudiced judges. The Links, or many of them, are so convinced of their own superiority over other photographers, that there is at least the danger of their developing mannerisms and conventionalities in their work that would in time rot

it of all pictorial value. It is an open question whether there are not already indications of such conventionalities, and also of mutual imitation.

Mr. Horsley Hinton is certainly in error in stating that the Pall Mall and the Salon are *equally* "open" exhibitions. At the latter, members' works are accepted because of their membership; at the former, members' and non-members' contributions are judged on an absolutely equal basis, and in hanging the same equality is maintained. This is the crucial point of the whole argument: that the prospectus in inviting contributions is so worded as to induce photographic workers to send in under the impression that it is an open exhibition, while in reality a large proportion of the space is already engaged by the Links' own contributions, some of which have little but their eccentricity or careless technique to recommend them. In assuming that, had the Links sent their works to the Pall Mall instead of the Salon, they would have had as many accepted, he expresses an opinion that he would have great difficulty in producing any facts to support. He admits "that the respective committees judge from a different standpoint." Fortunately for photographic work they do. It is pleasant to think that there is one point in his letter whereon we can agree.

One of his greatest inconsistencies is his suggestion that all letters from private persons attacking either the Pall Mall or the Salon should be suppressed, since one of the greatest offenders in this respect is Mr. Horsley Hinton himself. Though he writes in this instance as a private individual, he cannot disassociate himself from either his writings as Editor of the *Amateur Photographer* or as a member of the "Linked Ring." In his paper he scarcely ever alludes to the Royal Photographic Society without some sneering or more or less contemptuous reference, giving his readers to understand that it is an effete, poor, and third-rate institution, while no flattery is too great for the rival society. This might be excusable in a private individual, but the Editor of a public review should be an impartial critic. In reviewing the opening of this year's Salon, he devoted nearly a page to a consideration of the high artistic qualities of the works generally, and the lofty ideals and aims dictating their conception and execution (see *Amateur Photographer*, September 25, 1896, pp. 247 and 259).

In striking contrast is his article the following week chronicling the opening of the Pall Mall Exhibition. Perhaps he had used up all his expletives expressing admiration in writing of the Salon; certain it is that sneering and ill-natured sarcasm run through the whole of it; there is not a single word to indicate that the exhibition is even worth visiting, but much to convey the opposite impression. The following extracts require no comment:—

"The unprejudiced and competent visitor will find it difficult to select out of the 360 entries more than six works of first-rate pictorial merit; the conclusion looks like—well, no, we will not call it failure, there may be intermediate degrees between triumph and defeat," &c.

". . . . Should what we suggest come to pass, and an exhibition of scientific and mechanical photography be held in a new place, and the pictorial in Piccadilly, what will the Pall Mall do then, poor thing?"

And, alluding to the progressive spirit of the younger members—

"If they don't get the bit in their mouths and gallop the whole thing into a ditch."—*Amateur Photographer*, October 2, 1896, p. 268.

If these extracts really represent Mr. Horsley Hinton's opinion, no competent and impartial critic would endorse it.

At the termination of the Salon Exhibition he wrote that it had

"justified its existence by the general success which the public have secured for it."—*Amateur Photographer*, November 6, 1896, p. 365.

But a week later the same public support was considered no indication of the quality of the Pall Mall show, the mass of the paying public, we are told, being unable to distinguish.

"It is for the masses to applaud and to pay, and for the few to understand."—*Amateur Photographer*, November 13, 1896, p. 385.

How can he with any consistency advocate the suppression of letters attacking the Salon? Those who live in glass houses should never throw stones.

The most serious paragraph in Mr. Horsley Hinton's letter, however, is that in which he couples two statements of mine together, stigmatising them as "pure fabrication, and not a very reputable performance either."

Taking the latter statement first, I wrote that the one article of faith in which there appeared to be unity among the Links was their hostility towards the "Royal;" I can only judge from their writings, and at different times they have expressed the most widely diverging views on almost all questions of art and technique, but on this one theme they appear unanimous; Mr. Horsley Hinton's previously quoted articles being fair samples. Is it that they are jealous of its unquestionable success?

The other "disreputable fabrication" that is charged against me is that, 'like many others, I appear to regard the Salon Committee and the Link thing as synonymous." Well, I can only quote Mr. Horsley Hinton again:—

"The Linked Ring, or Salon Committee, now numbers some fifty members . . . . . the names of the Committee, which are printed on the first page of the catalogue. . . . ."—*Amateur Photographer*, September 25, 1896, p. 247.

"The Linked Ring, otherwise and more publicly known as the General Committee of the Photographic Salon."—*Amateur Photographer*, October 30, 1896, p. 345.

And for accepting these statements as true, I am called——well, Mr. Horsley Hinton really ought to improve his memory, the latter of these statements having appeared just ten days before the date of his letter!

In conclusion, I desire to impress on Mr. Horsley Hinton that I am neither "an indignant person," "a discontented correspondent," nor "one whom some imaginary grievance has rendered spiteful." Personally I have no grievance whatever. The fact has been emphasised that the Linked Ring is a private society; still, its exhibition is public and must conform to, and be judged by, the same standard as any other public organization. The leading Exhibitions, most of all, should be so conducted as to give no cause for misunderstanding or suspicion of unfairness.

Turning for a moment to Mr. Charles Moss's letter, which, from its courteous tone is at least more pleasant reading, I would say that the vigour of Mr. Horsley Hinton's reply is the best indication of the necessity of attempting to prove a self-evident fact. I agree with Mr. Moss that the more difficult a prize may be to win, and the keener the competition, the greater the honour in winning it—I will even go further, and say that the more desirous would a good and enthusiastic worker be of entering the contest; but the moment that any other consideration than merit is allowed to influence the decisions, the whole value of the competition is lost.—I am, yours, &c.,

HENRY W. BENNETT.

November 17, 1896.

COLOUR PHOTOGRAPHY.

To the EDITORS.

GENTLEMEN,—Mr. Ives charges me with "questionable methods of crying my own wares." Mr. Ives must be well aware, as well as most of your readers, that my letter was written as an answer to the article on *Transparencies in Natural Colours* in this JOURNAL, and wherein direct references were made concerning myself and my work. It is not my policy to *cry* my wares; I prefer they shall speak for themselves. The first condition for successful optical projection demands that the picture shall be upon a single *plane*, and I did not think it possible for one composed of six films (three films of gelatine upon three of celluloid) to fulfil these conditions. I also thought it *was a fact* that a print in bichromated gelatine or albumen produced a brown image, and that three such would make a vigorous positive. I had no *intention* of making a "misstatement," and I must leave this to the fair judgment of your readers.

Just another remark, and I will not further occupy your valuable space. Mr. Ives quotes from a private communication of mine (without my permission), and says I wrote him wishing to obtain one of his photochromoscope cameras," &c. That is so. It was my intention at that time (nearly a year ago) to bring out a method of three-colour printing for the *reproduction* of my own *colour photographs!* as they were expensive to produce. I have *never* required such a camera for the production of my *colour photographs*. Thanking you very much in anticipation.—I am, yours, &c.,

J. WALLACE BENNETTO.

PHOTOGRAPHY AND POLYTECHNICS.

To the EDITORS.

GENTLEMEN,—Mr. Matthew Surface, in your issue of November 20, disputes some of my statements respecting the polytechnics. He asserts that they are still mainly occupied in instructing photographic *employés*. According to the last report of the Examination Department of the City and Guilds of London Institute, 168 candidates presented themselves for examination in photography. This number represents, roughly, the professional photographers who passed the various polytechnics in England. Considering that the photographers between the ages of fifteen and twenty-five number some 3000, the comparison will give an idea of what such institutions are doing for the scientific education of photographic *employés*. From this it is evident that they depend mainly on outsiders.

Mr. Surface fails to see what harm can come from this to the genuine professional. It does great harm, because it multiplies photographic assistants at a greater rate than the natural expansion of trade requires. The apprenticeship system, I admit, errs in the opposite direction; but this is on the right side, for it does not increase the pressure of competition. As a result of the too rapid multiplication of assistants, the photographic labour market is overstocked, and what economic value polytechnic teaching may have added to the assistants is destroyed by excessive competition. Of course, if Mr. Surface wants to see photography reduced to the level of say—music, in which profession only men of genius, organ-grinders, teachers, and manufacturers can earn a competence, these economic considerations will have little weight. The effects do not stop with the assistants. At one time photography was the dumping ground for all the blind, lame, and halt in the kingdom. When a man lost a leg or an arm, it was said, "he will never be any good again at his trade—make him a photographer." In many cases

this was done. The fashion has changed, and in part, owing to the facilities offered by polytechnics, persons with a little capital, on the look out for a respectable and genteel occupation, instead of selecting a tuck shop, tobacconist's, dressmaker's, &c., plump for photography, and open a high-art studio in Mayfair or Whitechapel, according to their means. In this manner an excess of capital is introduced into photography, competition amongst employers becomes severe, and profits and prices fall. As a result, we have "unfair competition," and 4*l.* 4*s.* enlargements for 6*s.* 6*d.* From the point of view of the public this is a magnificent triumph of modern progress; but to the photographer the triumph is by no means so apparent.

In the second paragraph Mr. Surface merely restates my own position. As I said, the power to apply scientific principles is only possessed by the few, and not by the many; hence to teach scientific principles to those who can only use and appreciate the philosophy of the back kitchen is sheer waste of time. All our resources should be devoted to finding, and then instructing, the man who has the ability and can appreciate the scientific principles in their application to practice; hence the standard should be lowered for the average student and raised for the man of real ability. As Professor Huxley pointed out long ago, the aim of education is to find your man of genius. When found, he should be provided with all the requirements for the study and investigation of scientific principles. Such a laboratory, with men in it of the capacity of Abney, Eder, and Vogel, is called for at the present moment in photography rather than hundreds of men of average capacity with no real grip of remote scientific principles.

Coming to the third paragraph, Mr. Surface thinks that common politeness should be taught in the home. The meaning I attached to "professional etiquette" was hardly that of common politeness. A man may be a paragon of manners, and yet a fearful duffer in dealing with sitters, his negatives showing that he has only succeeded in boring his sitters most horribly. My meaning was more the "management of sitters," the art of obtaining pleasing portraits, and this can only be learned by serving in a studio under some experienced operator.—I am, yours, &c.,

JOHN A. RANDALL.

42, *Tonsley-hill, East-hill, Wandsworth, S.W., November* 21, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street. Covent Garden, London.*

PHOTOGRAPH REGISTERED:—

P. Charleton, Garrison Studio, Newbridge, Co. Kildare, Ireland.—*Photograph of Bob, the drum horse, 10th Prince of Wales Royal Hussars.*

ACETYLENE; CALCIUM CARBIDE, &c.; INQUIRY; H. J. BUCKLAND, and others. See under Ex Cathedrâ.

PHOTIQUE ART.—1. The process described is the ordinary photogravure process. 2. No; if the patent is really invalid, any one is at liberty to work the process.

THE SPARTAN.—We are somewhat of your way of thinking, but your letter is perhaps a little too violent in tone for an anonymous communication; hence we do not print it.

FOG.—S. CLARKE. If the view was taken in a fog, there is no way of treating the plate so as to take away the fog, and leaving the negative as if it were taken in fine weather.

SHELLAC SOLUTION.—In dissolving ordinary shellac, whether bleached or not, there is always a sediment of matter that is insoluble in alcohol. Allow that to subside, and decant the clear portion.

LENS.—LEEDS. Names only. Orthoscopic, Orthographic, and Caloscopic are all the same lens under different names as adopted by their various makers. They are not at all identical with the triplet.

MATERIAL FOR BACKGROUNDS.—A. Z. asks: "Would you please tell me where I can purchase calico wide enough for backgrounds?"—At any large furnishing warehouse. Better ask for "unbleached sheeting."

RETOUCHING.—NOVICE. The surface of a negative may be roughened by rubbing it over with finely powdered pumice or cuttlefish powder. We fancy, however, you would find it better to use one or other of the commercial retouching mediums.

COPYRIGHT.—F. B. J. Of course, you have no copyright in the picture. How can you have? The sitter paid your late employer in the ordinary course of business, and you, as his servant, took the portrait. It seems to us that you are trying to be a little too "smart" on leaving your employ. If you attempt to make the portrait copyright, and show it in your window, you may find yourself in trouble in more ways than one.

MICROSCOPIC WORK.—T. ARGENT. The objectives you have will do very well indeed for photo-micrography. We should recommend you to practise first with the inch and a half, on large subjects, till fairly perfect; then go on with the eighth, and, when proficient with that, use the still higher power. Beginners frequently make the mistake in essaying the use of high powers at the commencement, and then get disheartened by their results.

"PHOTOGRAPHISCHER ALMANAK."—E. FENSKE says: "Can you inform me where I could get the *Photographischer Almanak* for January, 1897 which you are reviewing in your last issue, and what is the price?"—In reply: Of E. Liesegang, Düsseldorf. Price, we believe, 1 mark.

FOGGY NEGATIVES.—O. MCNIEL. The only way we can account for the fog is the dark-room light. The lamp may be perfectly safe with slow, or even moderately quick plates, but may be just the reverse with those of extreme rapidity. Put a plate in a dark slide, pull out the shutter half way, and expose to the lamp for a minute or two, then develop, keeping as far from the light as you can get. We shall then expect that one half of the plate will be fogged, while the other will be clear, or comparatively so.

COLOURS.—J. H. MOODY writes: "Will you kindly inform me where I can get the colours used for colouring views, such as are usually seen in railway carriages and sold at most of the principal stationers? Also, if directions are sent with the same colours?"—Colours suitable for colouring photographs are sold by all artists' colourmen. They do not differ from those used by painters generally, therefore no directions for use are supplied with them. It is more than probable that the pictures our correspondent refers to are produced mechanically, and are not photographs coloured by hand.

MEALY PRINTS.—C. BENTON. The acetate of soda toning bath, with albumen paper, may be expected to yield mealy prints if it is used directly it is made up. This bath should not be employed until it has been made at least twenty-four hours—forty-eight is better. Over-toning is also a source of mealy prints. Some ready-sensitised albumen paper will not bear toning beyond a red-brown stage without the prints possessing this defect; but, if the toning be not carried beyond that point, no mealiness will be seen. Prints from weak negatives are more prone to mealiness, if deeply toned, than those from vigorous ones.

ELECTRIC LIGHT FOR LANTERN.—R. H. W. (Herts). Yes; battery power can be employed for the electric light in the lantern, but we fear that you will find that it is more trouble than most amateur lanternists would care to undertake. The Smee form of battery would be quite unsuitable for the purpose. The best would be the Grove or the Bunsen. Thirty to forty cells will yield a good light, and a smaller number would suffice for a smaller screen. If you must have electric light occasionally, would it not be better to hire secondary batteries, ready-charged, if they are to be had in your neighbourhood?

PRESS FOR COLLOTYPE.—W. RIED. There are many kinds of presses that may be used for collotype printing. An ordinary lithographic press may be used, so may the Albion press as used for typographic printing. In fact, one of the establishments that turn out some of the best collotypes produced in this country uses no other. Winstone & Son, Shoe-lane, make a press specially for collotype work, which may, no doubt, be had from Penrose & Co. Call on them. In Germany, when hand presses are used, they are similar in principle to the English litho presses and have a scraping pressure. So far as we are aware, they are not stocked by the dealers in this country.

OIL LANTERN.—J. TILLEY complains that his lantern "stinks abominably every time it is used." He says he has had new burners, and it is just the same as before. He asks if all lamps burning paraffin oil behave the same. No, they do not, if kept in proper order. In most cases, offensive fumes may be traced to want of care—the wicks not evenly trimmed, or not nicely adjusted while burning, for example. In the majority of the cases, the smell is due to the dirty state of the outside of the lamp. The oil on its surface vapourises, hence the smell. The whole of the outside of the lamp, and the wick tubes, should be wiped scrupulously clean with a dry rag before the lamp is lighted, then there will be no smell from a well-constructed apparatus.

RETURNING MONEY.—ONE IN DOUBT says: "I should esteem it a favour if you could answer me the following:—A photograph is taken of a lady and child; the child, we find, on developing, has moved; the negative, by accident, gets broken. A post-card is sent requesting another sitting, as it is not satisfactory. The husband writes, saying his wife cannot sit again, being unwell, and demands the cash paid to be returned, otherwise he will issue a County Court summons for the same. The query is, Is the photographer legally bound to return the cash paid? and, if not, could the said individual, do you think, recover the same in a County Court?"—In all probability, yes. The sitter paid for portraits of herself and child, which you fail to supply through no fault of hers. You broke the negatives; therefore, if she cannot or will not sit again, you should return the money you received, as you are unable to fulfil your part of the contract—supply the portraits.

COPYRIGHT. CRAYONS.—J. P. writes: "Will you kindly answer the following questions?—1. How can a photographer ascertain, for certain, whether a photograph (which he is asked to copy) is copyright, and what is the cost; and, also, would he have to send the particular photograph anywhere—Copyright Office, or elsewhere—for inspection? 2. What is the process of finishing enlargements in crayons; are crayons employed on bromides and carbon prints? also, what kind of crayons are used, where can I get them, and in what book, or article, can I get information on crayon finishing?"—In reply: 1. Only by searching the register kept at Stationers' Hall. The simplest way would be to write to the one who took the photograph and ask the question. 2. Crayons are employed on bromide as well as carbon prints. No special crayons are necessary. Those supplied by artists' colourmen, in the ordinary way, are what are used. We know of no work now in print dealing with the subject. The best way would be to get a few lessons from an artist who does this class of work.

*** Owing to our brief absence from town, several communications for the JOURNAL must stand over till next week.

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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EX CATHEDRÂ.

Our correspondence this week is of an unusually rebellious nature. We do not know whether to ascribe this to the effects of the bleak and autumnal weather, which may easily be understood as having a depressing and irritating effect upon photographers, or to the possibility of our having acquired, we hope rightly, the reputation of possessing an ear of sympathy for the trials and troubles of our professional readers; but in the complaints to which we make reference below we recognise so much for which photographers may legitimately claim publicity in our columns, that we have little hesitation in giving them place. Shall we add, Of each of the letters it may be said, as it may be said of many others that we constantly receive, that it is an argument and a plea for the establishment of a central, representative, and effective body to which professional photographers might turn for support when their interests are unfairly assailed?

* * *

First of all, Mr. C. A. Jackson, photographer, of Middleton and 2, Clegg-street, Oldham, says, with reference to the following letter, which he encloses, that it may be of interest to us—which it is—and that he is not in need of "so good a tip." It will be observed that the authors of the letter, Messrs. R. Boscawent & Co., photographic and novelty publishers, dating from 41, Cyrus-street, Goswell-road, London, E.C., ask for the payment of the tangible sum of 10*s*, in return for which they undertake to place the photographer who parts with that sum in possession of an "idea." We have only to remark that the world—yea, even the photographic world—is full of "ideas," and that many of them are extremely dear at 10*s*. each.

* * *

However, Messrs. R. Boscawent & Co. shall plead their own case:—

"We are," they say, "desirous of making arrangements with a photographer in your town for the working of an idea, which has met with a very large measure of success in London and other parts. Only one firm in your town will be furnished with the necessary particulars and information, and, subject to the conditions named below, we make you the first offer. At the present time we have not approached any other photographer in Middleton with reference to this matter, and, should you be enabled and disposed to take it up, we shall have no occasion to communicate with any one else on the subject. The work is within the compass of any professional photographer, and the value of the idea referred to chiefly consists in that it creates a big demand for photographs. The conditions necessary to our giving you the requisite instructions are:—

"1. That you have, or can obtain use of, half-plate or whole-plate outfit.

"2. That you agree to allow us 10*s*. on every 10*l*. net profit.

"3. That you remit us 10*s*. previous to our sending you the necessary information and instructions.

"The reason, we may mention, for the last-named condition lies in the fact that, although the idea is, and has been, most remunerative, it is not, and cannot be, patented or protected in any way; and, for the same reason, the carrying out of the second condition will be entirely a matter of honour on your part. We guarantee the work *very* profitable, and it would, moreover, be a big advertisement for you, and give you considerable advantages over any competing house. On receipt of remittance for 10*s*., together with a statement that you agree to pay the commission named, we will *at once* place you in possession of the fullest necessary information to permit of your proceeding with the work, for which no outlay of capital beyond the 10*s*. mentioned is necessary. Unless we hear from you promptly, we shall conclude that, for some reason or another, you are unable to interest yourself in the matter, and

shall act accordingly. The possession or use of half-plate or whole-plate outfit is *absolutely essential.*"

* * *

Next, Mr. Thomas Pinder, photographer, of 100, Yorkshire-street, Rochdale, encloses us a circular which he says was sent to each householder in his town by a grocer, who has about forty shops. Mr. Pinder adds some observations about the religious standing of the grocer which it is not necessary for us to reproduce; and he also asks for any remarks that we might like to make. We need say no more than this, that some years ago a tobacconist of our acquaintance gave away photograph coupons with the tobacco he sold us, and that we experimentally proved that neither the tobacco nor the photographs were as good as we could have obtained in the ordinary way elsewhere by paying the ordinary prices.

* * *

But we append the circular sent us by Mr. Pinder. It bears a curious resemblance to many other circulars which we have the best reason for believing come from a common source.

"Have you a photograph of relative or friend which is constantly fading? Would you like it enlarged into a beautiful portrait worth a couple of guineas, free of cost, for those who regularly use —— Tea. With every quarter pound of tea we give a 3*d.* check. When you have got six shillings' worth of checks, bring them—together with your photograph—to any of our branches, and in about fourteen days you will receive a beautiful enlargement, along with the original photograph. We have a choice variety of frames suitable for these enlargements at 4*s.* 6*d.* each."

* * *

Finally, a copy of the *British Almanac* (of course no reader will confuse this with The British Journal Photographic Almanac), published by Messrs. Charles Letts & Co., is placed before us. Were we reviewing this work, we should have nothing but praise for it, as it is an admirably compiled publication. But we turn to page 367 of the work, and we find it stated there that, in order to increase the popularity of the book, the publishers have arranged with the photographers named in a subjoined list to supply *gratuitously* a cabinet-size photograph of the owner of each volume. The conditions governing the use of an annexed coupon are then recited.

* * *

For reasons that we give below, it might be thought that the list of photographers who have agreed to take photographs for nothing is a large one, and embraces all the best firms in the profession. Will it be believed, then, that in London only *four* photographers have agreed to take photographs on the off-chance of thereby obtaining subsequent orders, and that in the whole of the provinces—English and Scotch—not more than forty-six photographers have been found possessed of the same ambition? We must confess ourselves disappointed with this paucity of numbers, for, turning back to our issue of September 11, we find that we quoted Messrs. Letts as saying that "the most general opinion of the photographic profession" was that "the scheme should prove a most excellent one from the photographer's point of view!" Yet—such is man's ingratitude—only fifty photographers have availed themselves of the scheme! But more: On September 18 we quoted Messrs. Letts as saying that they were "literally inundated with applications from the very first photographers throughout Great Britain, and the only difficulty will be to make a selection!" So the very first photographers of Great Britain number fifty, and are sufficient to constitute an inundation! But we are more merciful than Messrs. Letts, and we therefore withhold the names of these fifty photographic philanthropists.

IS THE RULED-SCREEN SYSTEM THE BEST FOR PROCESS BLOCKS?

At the last Photo-mechanical Meeting of the Royal Photographic Society a by no means bad suggestion was made, namely, that experimentalists should give attention to some of the old processes, such as those by which excellent results could be, and were, produced in years gone by. Pretsch's, for example, was quoted as being deserving of notice. During the past few years great improvements have undoubtedly been made in the production of half-tone blocks, but only in one direction, the ruled-screen system. So firmly has this method now become established that few, if any, at least of those who work commercially, give any thought whatever to any other. Photo-mechanical workers, we are sorry to say, like photographers generally, are very conservative in such matters. So long as they get good results they seldom care to seek for anything superior, and this appears to be the case with the ruled-screen system of making half-tone typographic blocks.

Although excellent blocks are now produced by this system, yet they are open to many objections. The uniform, mechanical, net-like grain is very objectionable from an artistic point of view. The blocks are more difficult and costly to print, when the finest results are required, than are engraved wood blocks. For instance, a paper, ink, and printing that would yield good prints from ordinary wood blocks will not do at all, for high-class work, for process blocks, the relief is too low, and the grain too fine, for rapid working in a machine, with a medium-quality paper and ink. Greater skill, or rather a great deal more care, on the part of the machine man, in the "making ready" and the working of process blocks, is necessary than is the case with engraved wood blocks. It is this that has caused some of the best illustrateds to revert to line blocks for so many of their portraits.

Will that continue? Will workers go on trying to improve one process only, and giving no heed whatever to any other that may be made available, and possibly with great advantages in working if the same amount of skill and attention were expended upon them as has been done in the ruled-screen method? In proof that other methods are available, one has only to refer to back volumes of the Journal, or the records of the Patent Office, to be convinced, and our older readers to be reminded, of the fact.

The Pretsch method was referred to at the meeting just referred to. This is a swelled-gelatine method, in which the grain, instead of being a uniform mechanical one, is a discriminating one, more open in the lights than in the shadows, in the deepest of which there is practically no grain at all. It may very well be asked why, if this process of five-and-thirty years age is now suggested as a promising one at the hands of experimentalists, it has been so long in abeyance. There are more reasons than one why this is the case. One is that the time was not commercially ripe for it, the process was "too previous," a demand did not exist for it, though it materially helped to lay the foundation for that class of work. Another reason probably was that, at that period, the properties and characteristics of chromated gelatine were not thoroughly

understood, hence the results could not be relied upon. As a consequence the blocks were frequently inferior in quality, thus entailing delay and loss.

There is also the Placet method of chemical graining. In this method, as in that of Pretsch, the grain is a discriminating one, and, in the hands of novices, it will probably yield more uniform results, though not better than Pretsch's when the principles involved in that are thoroughly understood. Placet's process seems to have been completely neglected alike by practical workers and experimentalists, but why it is a little difficult to understand. It may, however, be that, like some other photographic processes, it was invented before its time commercially, and, as it was not worked, became almost forgotten.

There is the Swan method of producing relief blocks, which was patented by him in 1879. This is a screen and a swelled-gelatine process combined, and it has the advantage that the original negative itself becomes the swelled and lined matrix from which the printing block is moulded. The process of Swan is capable of yielding very good results. It was re-invented some years after the patent had lapsed, and was patented afresh. A limited company or syndicate was formed to work it, but we believe the concern did not prove a very flourishing one. A company was formed some thirty-five years ago, it may be mentioned, to work Pretsch's process, but it proved a commercial failure. It does not follow, however, because a company fails to successfully work a process commercially, that the process itself is at fault, because the failure may be due to lack of skill on the part of its workers, or, maybe, to want of business tact in the management.

At some future time we may recur to this subject, and point out other photo-mechanical processes that have been neglected which might profitably receive attention, inasmuch as the principles involved in them are better understood now than when they were first invented.

Photographs of Flying Bullets.—Our readers are doubtless familiar with the wonderful photographs by Professor C. Vernon Boys, F.R.S., of flying projectiles from rifles, &c. (taken by the electric spark), in which the wave of air accompanying the bullet was remarkably clearly depicted. Professor Mach has sent to the Editor of *La Nature* a similar kind of photograph, taken by the Professor's son by an entirely different arrangement. *Nature*, last week, contains an illustration of the photograph, and a reproduction of a sketch of the apparatus by which he "took the photograph of the bullet by using a spherical silvered glass mirror. . . . . The bullet causes a sonorous wave, by which the Leyden jar is mechanically discharged and produces the spark."

Forms of Tubes for Röntgen-ray Work. — In *La Nature* last week will be found a long descriptive article upon the various forms to which, in the process of gradual development, the original Crookes' tube has been brought. No less than thirty-two tubes are pictured and verbally described. Nineteen are based upon the utilisation of the direct action of the rays, ten on the reflected action, and three on a combination of the two. Naturally, prominence is given to the names of French makers, though we find two with the name of Crookes appended, one with Wood and one with Tompson. The "focus tube" so much adopted in this country, which is usually associated with Mr. Jackson's name, is neither illustrated nor alluded to in the text. The good work done by the first-named class of tubes before the advent of special forms is justly noted, though it is properly pointed out that, though the results were good, they were slow and the sharpness of image was least.

The New Element Lucium.—The shareholders in the Incandescent Gas Light Company will, no doubt, read with a great deal of pleasure an article by Mr. Crookes, F.R.S., the Editor of the *Chemical News*, in that journal, describing a close analytical examination of the alleged new element lucium, so named by its discoverer. As before described to our readers, the discoverer anticipated that it could be used to make mantles for incandescent burners, and as a new substitute entirely, avoiding any infringement of the Welsbach patent. Mr. Crookes' examination, however, would seem to show conclusively that lucium is practically a mixture of ytterbium with a small amount of didymium, erbium, and possibly some others of the rare earth metals. It may be remembered that sodium thiosulphate ("hypo") was used for throwing down the supposed new element, and Mr. Crookes says of this, "The error has arisen by considering the sodium thiosulphate separation as a complete one, whereas yttria partially comes down if the solutions are strong and heated.

Another Lost Chance for the Photographer.—According to the *Standard*, a French traveller in the Indo-Chinese region has captured a native savage of the race called Moï, who is the veritable missing link. He climbed trees like a monkey with the sole of his foot to the tree, and, beyond all, he had a tail. M. Paul d'Enjoy, the traveller in question, seems to have been able to converse with him, it is not stated how, and he learnt that most of the Moïs have tails, but through intermarriage with ordinary mortals the appendage is not general. M. d'Enjoy does not state whether the savage could wag his tail, nor, if afraid, tuck it between his legs, and altogether the account is received with incredulity. What appears to us the gravest cause for doubt is the fact that, while nowadays nearly every traveller is a "button-presser," we have not a single word about a photograph of this missing link. We may be sure that, if it should be proved that these Moïs really exist, the irrepressible interviewer, with camera in hand, will soon be at his heels.

"The Devil's Signature."—Under this heading is described in the *English Mechanic* a violent controversy which is being carried on by a leading Roman Catholic paper in Germany and the Catholic Director Künzle, of Feldburg, in the Tyrol, as to whether a signature claimed to have been made by the devil can ever be accepted as genuine. The newspaper claims that it is impossible to secure a genuine signature of his Satanic majesty. Künzle retorts that the paper, in making such a statement, is untrue to Catholic teaching and traditions, and his point of view is backed up by the Prince von Löwenstein, the stated President of the Catholic Congress of Germany. Now, of course, we have nothing whatever to do with such a controversy; but there the signature is, and what we would ask is, What are the photographers about that they have not, by guile or stratagem, obtained a photograph of the signature under discussion? Surely there is a fortune for the man who can sell broadcast through Europe cabinet pictures, say, with the inscription below, *The Devil's Signature*. Then the illustrated papers, what would not they offer for sole permission to publish? It is a grave question whether such a picture—for this signature with its adornments is a picture—would subject to copyright.

DIGRESSIONS.

No. XII.—The Picturesque and the Beautiful.

The picturesque and the beautiful are the chief materials on which the pictorial photographer exercises his art. As "music is the food of love," the qualities about which I am about to discourse are the food of the artist. The other artistic emotions (except the merry ones), such as sublimity and terror, are perhaps beyond the power of photographic expression. Possibly the time may come when our friend the scientist will supply us with a louder thunder and a more vivid lightning; we will then endeavour to wield them with pleasure, and, who knows? we may reach the sublime. It is to be hoped that the lower qualities, from which the exaggerated impres-

sionist used to draw his inspiration—such as it was—the ugly and sordid, the music hall and the coster, will cease to exist as a subject for art treatment.

At the end of the last century and the beginning of the wonderful one we are now bringing to a conclusion, the relation of the picturesque to the beautiful was a favourite subject with authors who belaboured each other with much amiable ferocity. Witness Alison on *Taste;* Burke, on the *Sublime and Beautiful;* Knight's *Analytical Inquiry into the Principles of Taste;* Repton's *Letters;* Price, on the *Picturesque;* Gilpin's *Essay on Picturesque Beauty;* and many others. These books, some of them portly volumes, referred principally to landscape gardening, but, to get at where to plant a bush, it seemed to be necessary to review all art from the beginning, and, in designing the plan and elevation of a shed, it appeared desirable to discuss the Great Wall of China, the pyramids of Egypt, the colonnades of Palmyra, and the aqueducts of Rome; therefore we have in this field of literature a good deal of "fine confused reading" which I shall probably make use of as I go on. I may, perhaps, as well mention that Downton Woods and the Hay Mill, near Ludlow, known to many photographers, are the result of the experiments and planting of John Payne Knight, the author of the *Inquiry*, who owned the castle and estate about a century ago.

It is possible there are some who are not able to recognise much difference between the picturesque and the beautiful, and others compromise the matter by talking of the picturesque beauty of a scene. There are few words whose meaning has been less accurately determined than the word "picturesque," and, in the language of America (which is derived from the English), I am not sure that it exists at all, certainly not with the same spelling. But there can be no doubt that picturesqueness is a very real and distinct quality.

The word was originally applied to every kind of scenery or object which had been, or might be, represented with good effect in a picture; but it has long since acquired a more extended meaning. Thus we have picturesque language, and many things we now call by the name which are quite unpaintable.

The picturesque has a character not less separate and distinct than either the sublime or the beautiful. The difference between the three qualities may be broadly described as—the picturesque, rough, or rugged, or irregular; the beautiful, graceful; the sublime partakes more of grandeur and awe, but may be dismissed from present consideration as not being within the limits of our art.

The words "picturesque" and "beautiful" would cover the greatest and best qualities a photographer could desire to get into his pictures, and to have a clear idea in the mind of what these qualities are and their causes would be a great help to their attainment. We will now, therefore, attempt to throw together a few ideas of what picturesqueness really is.

Roughness, or ruggedness, joined to irregularity, are the most efficient causes of the picturesque.

This will appear clear if we take a view of those objects, natural or artificial, that are allowed to possess the quality, and compare them with those which are allowed to be beautiful.

For instance, there has just passed down the road a family of hoppers; it is raining steadily with the persistence of an autumn that follows a rainless spring and summer. The miserable father and mother and wretched children are a sad sight. Nothing could be further from the beautiful, but they are very picturesque. As a contrast, a charming young lady, adorned for her first important ball, may be beautiful, but, even if not charming, she could not be picturesque, although she may be very paintable, or make a delightful photograph. It must not be understood, however, that misery, as in the case of the hoppers, was necessary to picturesqueness. The most picturesque model I ever had was certainly the most jolly.

Now for an example from landscape architecture. A temple of Grecian design in its perfect state, either in painting or reality, may be beautiful; in ruin it is picturesque. Time usually converts a beautiful object into a picturesque one. Weather stains, lichens, partial incrustations, mosses, break up uniformity of surface, give a degree of roughness and variety of tint; variations of weather crumble stone, and give a degree of ruggedness; the primness of beauty deserts the object, and gives place to the pictureque. A geometrically planned garden, with smooth turf, nice-trimmed walks and shrubberies, may possibly be beautiful, but could never become picturesque until it was neglected, overgrown with wild plants and creepers, and ivy mantled the statues and fountains.

Symmetry and regularity accord with beauty, but are adverse to the picturesque, and among the causes of the superior picturesqueness of ruins, compared with entire buildings, the destruction of symmetry is by no means the least powerful.

The origin of most of the picturesqueness of the world, from the humble cottage up to the highest Alps, is decay. It is also the cause of much of the best poetry. The contemplation of death, and especially the approach of death, seems to be eminently adapted for producing that pleasing melancholy which is certainly poetical, and seems to have a charm for most people. Poets dwell more on the sadness of parting lovers than on their meeting; jocund day standing on the mountain-tops may be occasionally mentioned by the poet, but he touches the feelings with a more thrilling sensation when his theme is a sunset. Why people should prefer to be touched to "the sacred source of sympathetic tears" as the highest form of pleasure, rather than be

> "A happy soul, that all the way
> To heaven hath a summer day,"

is too tremendous a question for me to consider here, but there can be no doubt it is a fact. In our small way, nearly every exhibiting photographer found that out for himself a few years ago, or, unhappy thought, did he purloin the idea from his neighbour? and we were deluged with dying days, mellow eves, twilight musings, rising mists, and midsummer nights. One effect was that suitable quotations from the poets were driven to a premium.

Now, I have not a word to say against this melancholy movement, except that we have had too much of it, not of the true kind, but of the inferior imitation; indeed, I very heartily applaud it. Anything that tends towards poetry in a photograph is to be commended. The difficulty came in, as usual, with the uninspired imitators. They seldom went to nature to find poetry for themselves, or to absorb the feeling with their own souls, they went to find something like that subject of their neighbours, because they thought they could do it as well. That mine was full of nuggets, but it has panned out. We want another general subject now. Cannot we do something with mid-day or even afternoon? If one or two would do something beautiful that looked easy, there would surely be plenty of followers. Milton made as good poetry out of *L'Allegro* as *Il Penseroso*, though it has always troubled me that he gave foreign titles to these two delightfully English poems—an affectation that has never yet died out.

In photography it is so difficult to be original, so easy to "level up," or seem to do so. Not only in single pictures, but in whole exhibitions, imitation is rampant. As it is probably all for the good of photography, and may possibly, in the future ages, lead to something more original, I am, indeed, proud to see my own pet child, the Salon, imitated in every item of outward dress, the cut and fashion, even to the numbers hung and the arrangement of bays they are hung in, the body but, unfortunately, not the soul, by those who once did not wish it well, reminding us of Tennyson's playful little verses:—

> "To and fro they went,
> Through my garden bower,
> And, muttering discontent,
> Cursed me and my flower.
>
> "Then it grew so tall
> It wore a crown of light,
> But thieves from o'er the wall
> Stole the seed by night.
>
> "Read my little fable;
> He that runs may read;
> Most can raise the flower now,
> For all have got the seed."

But I am running away from my subject in my usual reckless way. It is well I headed these poor essays "Digressions."

Beauty is the so much more enchanting and popular quality that the word "beautiful" is often wrongly applied as the highest commendation to whatever gives us pleasure or raises our admiration, be the cause what it will. The ordinary human being seldom uses the word "picturesque," it is always beautiful, if, indeed, it is not jolly, heavenly, stunning, or one of those slang terms that of late years have been added to the vocabulary of the worshippers of the beautiful.

The power of beauty has been the theme of the poets for ages. Beauty has a different effect on different people; the appearance of things depends very much on the mind of the beholder, as also does the effect. When Milton's Satan first saw the beauty of Eve, he was struck "stupidly good." A good phrase, but the effect was but transient. With many people beauty consists of only "what is worn." Yesterday I met a daughter of Eve with a structure on her head made of swan's wings, set upright, with an outward leaning, a sort of imitation of King Arthur's helmet, on which "the dragon of the great pendragonship blazed." However preposterous this wonderful construction appeared to others, it is easy to conceive she thought it beautiful. Fashion, even in the worship of the beautiful, changes, and we are almost compelled to acknowledge, with the poet—

"There's no such thing as that we beauty call:
It is mere cozenage all;
For, though some long ago
Liked certain colours mingled so-and-so,
That does not tie one now from choosing new.
If I a fancy take
To black and blue,
That fancy doth it beauty make."

H. P. Robinson.

FOREIGN NEWS AND NOTES.

Faded P.O.P. Prints.—N. Ley points out that gelatino-chloride prints which have faded may be restored, to a great extent, by physical development. If mounted, they should be stripped off the mounts by laying on top of the print a piece of blotting-paper soaked in water, which should be kept constantly damped. After removal from the mount, the print should be soaked in water, and the whole of the mountant washed off, and the print allowed to soak till it is thoroughly and evenly wet. If the print has been much handled, it will be advisable to rub the surface with benzine before stripping. The print should be laid in a clean dish, and flowed over with a mixture of aristogen, which is an acid solution of hydroquinone, and a few drops of silver nitrate solution to which some acetic acid has been added. As soon as about half the required intensity is attained, the prints should be washed and fixed, as they dry rather darker. If the whites show any tendency to deposit, a weak cyanide bath should be used to clear them up.

Argentaurum.—A big syndicate has been formed in the States to work Emmens' process of converting silver into gold, or a metal similar in appearance. This recalls Carey Lea's experiments with photo-chloride of silver; and now Edison is stated to have produced a metal which has the colour, weight, and ductility, besides all the other physical properties, of gold. Tesla is stated to have attained the same end by allowing the X rays which were produced from a silver electrode to fall upon a silver plate. Professor Fra Remsen, of the John Hopkins University of Baltimore, has been at work on the same subject, and is now constructing special apparatus for this purpose. It appears that Emmens has converted his silver, with a loss of twenty-five per cent. in weight, into a metal which is not silver and is not gold, but has all the physical properties of gold. It is said to be a new element.

Acetylene.—The importance of this gas has been fully recognised in France, and M. Reyner has incorporated with *Le Journal de petit Photographie le Journal de l'Acétylène*. The principal constructors of acetylene generators have also formed themselves into a Society, La Société Technique de l'Acétylène et des Industries qui s'y rattachent. The Prefecture of the Police has also called a committee of the leading men in the scientific world, and drawn up rules for the manufacture and use of the gas. The manufacture can only be undertaken by authority, and in isolated establishments, like explosives of the first class, and rules to be observed by the workmen have also been drafted. The above-mentioned committee contained such well-known names as Troost, Vieille, Girard, Schützenberger, Moissan, Levy, Dumont, &c.

A New Collodion Paper. — Ley suggests, in the *Photographisches Archiv*, a new method of preparing collodion paper, which has the advantage of never rolling up and never blistering. In a porcelain dish, the ordinary mixture of sulphuric and nitric acids, such as is used for making collodion, should be placed, and a sheet of paper allowed to float on it till it has been nitrated through half its thickness, the acid should then be well washed away, the wet surface coated with solution of barium chloride, and again well washed. On drying, one has a kind of baryta paper, which, when coated with a collodio-chloride emulsion, will, on its surface, partly enter into solution, and the sensitive film will thus be firmly held, and not be likely to frill, whilst the unaltered paper will prevent its curling.

Waterproofing Wood and Card.—A writer in a Russian journal suggests the following methods of making wood and card watertight: 1. Coating the wood with a mixture of potassium bichromate and gelatine, and exposing to light. 2. Immersing the article in a warm solution of paraffin, to which some solution of gutta percha in benzole has been added. 3. Painting the wood with a mixture of asphalt and gutta percha-benzole solutions and exposing to light. 4. Coating with a mixture of 100 parts of resin dissolved in eighteen parts of boiling nut oil. 5. Painting with a mixture of caseine, quicklime, and albumen, well mixed together. After coating with any one of these substances, the film should be rubbed down with pumice, then painted with good oil paint, rubbed down with pumice, and then varnished.

A New Fire-proof Paper can, according to the *Correspondenz*, be made by incorporating ninety-five parts of asbestos fibre, which have been bleached in a solution of calcium permanganate, and afterwards treated with sulphuric acid, with five parts of wood pulp. The mixture is then pasted by lime water and borax, and spread in the usual way. This paper, it is said, will withstand even a white heat without charring.

The X rays again.—Sehrwald states that not only the diamond, but also all amorphous carbon and all organic compounds rich in carbon, are very transparent to the X rays; further, that the halogens, chlorine, bromine, and iodine, are in the pure state very opaque to the X rays, and that all chemical compounds of the halogens are more or less opaque in proportion to their percentage of haloid. Chloroform and bromoform are extremely opaque, the latter even in thin films casting as heavy a shadow as brass. Cyanogen, on the other hand, is rather transparent. Carbon, hydrogen, oxygen, and nitrogen, are all transparent, and the author states that the shadows of animal tissue are partly dependent on the hæmoglobin and the proportion of chlorine that they contain.

Formaldehyde in Alkaline Developers. — MM. Lumière Frères and Seyewitz have been testing the truth of the statement that formaline added to the alkaline developers acts as a tanning agent, and, whilst they have confirmed this, they state that its use is accompanied by such deep colouration in the case of pyro, di-amidophenol, hydroquinone, and eikonogen, that its use is not to be recommended; only in the case of para-amidophenol and metol should it be used.

A New Remedy for Burns.—Dr. Thiery, of Paris, has discovered that a saturated solution of picric acid is a splendid remedy for burns; it instantly stops all pain, and prevents the formation of blisters, the only disadvantage being the deep yellow staining of the skin, which can be removed with aqueous solution of boric acid.

Intensification.—Paul V. Janko has been determinining the various degrees of intensity given by the best known intensifiers, and has drawn up the following table.

Bleached in	Blackened by	Ratio of Intensity
Cupric Bromide	Metol	15 : 14
,,	Hydroquinone	15 : 13
,,	Pyrogallol	15 : 12
,,	Silver nitrate	15 : 8
—	Mercuric iodide (Edwards)	15 : 10
Mercuric Chloride	Sodium sulphite	15 : 14
,,	Ferrous oxalate	15 : 13
,,	Hydroquinone	15 : 12
,,	Hyposulphite, or with ammonia	15 : 11
,,	Ammonia	15 : 10
,,	Ammonia, the plate being dried before blackening	15 : 8·5
,,	Ammonium sulphide	15 : 7
—	Uranium	15 : 6

The uranium intensifier gives the greatest increase, next ammonium sulphide, a result which agrees with practice.

PHOTOGRAPHERS AND COPYRIGHTS.

The leading article on the subject of copyrights that appeared a short time ago in these pages contains many valuable hints, which it may be useful to expand by some personal experiences, as the subject is one of continually increasing interest. A glance at the illustrated papers of to-day and those of a decade ago will show that a large number now virtually owe their existence to photography and photographers. If photography were to become non-existent, or not available, their functions would be gone in the majority of cases, and they would cease to exist; but, concurrently with the springing up of so many new weeklies of the class alluded to, their requirements in regard to photography have become more exacting, and so great is the competition among photographers, and so many the non-professionals who cater for the Press, that any one desiring to have a share in the work must be alert to seize his opportunity and use the utmost celerity in getting his results into the publisher's hands. Personally, I may say I have been very successful in finding suitable subjects, and have received many scores of copyright fees; but it is generally a severe tax on the energies of both myself and staff to get work through quickly enough. It will be instructive if I say that in the majority of cases the negatives have been taken, retouched, printed from, circulars, when necessary, written and lithographed on the premises, and all dispatched on the day of taking. When a subject is one of passing interest only—be it of persons, things, or places—it is of no use sending to the papers a few days after the event; the sender would be asked if it happened before the Deluge.

So far as to the business part of this work. The question of copyright is next to be considered. It will be found that in nearly all cases the editors will treat photographers with the utmost courtesy, liberality, and honesty. No one need hesitate to intrust a valuable picture to their keeping, even though the exigencies of speed of production may not have permitted a proof to be registered before sending the picture. Ordinary business tact, however, will suggest that not more than a day should be lost in carrying out that essential formality. There really need not be any delay, for it is so easy to get a developed print off in a very short time, and it is by no means necessary that the print sent with the registration form should be a specially good one. Any print, however imperfect, will, if necessary, answer the purpose; indeed, as a matter of fact, it is not absolutely essential that any print at all should go, if a sufficient description could be given of it; but, actually, it is very advisable on all accounts that one should be sent. The photographer should always have ready at hand a sufficient supply of registration forms; these he can obtain by post upon writing to the Registrar, Stationers' Hall, Ludgate-hill, London, E.C., and enclosing one penny for each form, with a sufficient sum for postage. Judging from inquiries I have received, it will be news to many photographers to know that it is not necessary even to employ an agent or intermediary to conduct the registration. When a form is duly filled up with *one* accompanying photograph, and posted to the Registrar as above, he will carry out all the necessary formalities, and will also, if reply postage be sent to him, send a receipt for the money (one shilling) needed for such registration—a receipt for the money, but not for the registration form nor the photograph.

There remains to be considered the question of piracy, and how to act. Here, again, promptitude is desirable; as soon as an infringement is discovered, steps should be taken. The matter should be placed either in the hands of the Photographic Copyright Union, or it should be given to a solicitor familiar with this branch of practice. A few special experiences narrated will perhaps be useful in aiding the photographer interested to come to a decision as to which mode to adopt.

Some little time ago the Autotype Company found one of their copyright pictures pirated. The head of the firm placed the matter in his solicitor's hands, and, in two or three days, obtained heavy compensation —if I recollect rightly, fifty pounds—without going into court.

Again, Mr. Whitlock had a case. I am informed that he took it to the Photographic Copyright Union, and they would not do anything with it. He then put it in the local court and gained half his case, appealed to a higher court, and gained on both counts he claimed on.

Quite recently a paper, with a very large circulation, pirated one of my photographs, that of Mr. Gladstone and Li Hung Chang together at Hawarden Castle — one of the most popular and saleable portraits published for some time past. Being a member of the Union, I placed the matter unreservedly in their hands, and signed a document authorising them to take any necessary steps, and undertaking to abide by the decision of the Union officials as to the compensation to be accepted. (The Union specially recommend photographers to put all copyright arrangements in their hands, as being more likely, by reason of their experience, to obtain better terms than the photographers themselves.) In my case, the offer of compensation they received and transmitted to me was the sum of two guineas, out of which would have to come solicitor's charges and, for the Union, twenty-five per cent. off the remainder. They asked me to wire if I would accept it, or if I wished them to claim the solicitor's fees extra. They did not suggest anything further, nor say they thought more could, or should, be obtained; hence the case may be considered a typical example of the extent to which country photographers' interests are looked after by the Union. Although I had undertaken to abide by their decision, I could not but try to urge them to do something better, and I wired that the offer was absurd, and that several legitimate users had paid me six guineas for permission. I also wrote to the same effect, and that fifty guineas was a just claim, and a hundred none too much. I pointed out that, if a captured thief escaped by simply paying the value of the goods he had stolen, the enforced payment could not be called a punishment, and that I understood the Union wished to stop piracy by, *inter alia*, punishing pirates.

Eventually, after further parley and letters, the Committee's decision was written to me by the Secretary: "*The matter has been laid before my Committee, and they are of opinion that, under the circumstances*" (note this expression,—G. W. W.) "*that the amount, 10l. in cash, is adequate compensation. Please let us have your confirmation of this per return, and cheque for 10l., less the Union's commission shall be sent.*" I wired acceptance, and wrote complaining very strongly of the most inadequate sum they had obtained, which, I stated, I had accepted as I had no other option. They demurred to this remark. I leave it to my readers to say, after perusing the following extract from a document the Union sent for my signature at the outset, whether I was not right: "*I agree to leave the matter in the hands of the Union and their solicitor for settlement upon such terms as they think reasonable.*"

As the Union take twenty-five per cent. of the compensation obtained by their agency, I received seven and a half guineas, which is just twenty-five per cent. more than legitimate uses paid—a sum so extremely inadequate that I pointed out to them that it was a direct incitement to future piracy.

It will be asked, What was meant by "under the circumstances?" They were: First, an admission by the pirate that my picture had been used; secondly, an explanation that the manager of the paper, who looked after this part of the work, was away at the time; third, that they paid copyright fees regularly, and would have done so in this case when the time came (!); fourth, they accidentally omitted to put my name under the picture, but could easily remedy that by mentioning it in a future number; lastly, they said my maximum fee was two guineas, the only proof of which statement they gave to the Union being a two years' old quotation of mine for a set of my copyright pictures, *that had then had their day*, of some quite different subjects. Not one word of explanation why they had not asked permission to use the picture. The reason of this is obvious when I point out that a woodcut had been made of my photograph, and in it the figures were placed closer together, and the lower portion cut away, a sort of thing that might readily escape discovery.

Now, as it is quite possible the Photographic Copyright Union may have something to say in this matter, it will be an excellent opportunity for them to show that piracy compensation plums are not confined to the London members of the Union, and to answer two questions to which no one would be more pleased (and surprised) to see an affirmative reply than I should.

1. Have any provincial photographers obtained large compensations through the Union? If so, what are their names? I do not ask for amounts, that might be a private matter, but not so the names.

2. Have they any example of one of their London members being satisfied with the net sum of twenty-five per cent. extra as compensation for a piracy of a valuable copyright picture (say one for which the papers have paid them over 5*l.* each for use) of a copyright of a subject important enough to be taken by three papers at once for the same week-end issue (a most exceptional thing, as any one who has had much to do with the subject of my article is aware)?

Finally, I may be asked, What my advice is to country photographers as to how to proceed in case of piracy? I prefer to leave the above-recited facts to speak for themselves, first pointing out that the Photographic Copyright Union will not take any case whatever into court about the result of which they feel a doubt; it is obvious, that when they decide to take a case up, it would be morally certain to succeed if the law has to be invoked. It should further be remembered that they take twenty-five per cent. of all compensation obtained without going into court, and thirty-three and a third off the net result if they do go successfully into court. My own opinion is very strong as to whether or no I should use the Union; but, as I may be biassed, I do not give it utterance. I would have preferred to publish my correspondence with the Union *verbatim* in these pages, but the Union Committee, on being asked if they were willing, objected to the publication.

In conclusion, I may add another question. At the General Meeting the President, rebutting the accusation that the Union existed for the benefit of a London clique, said that seventy-five per cent. of the compensation was obtained for provincial members. Will he say that these members do not number more than seventy-five per cent. of the total membership; for, if they do exceed that proportion, the argument would go against the Union.

G. Watmough Webster, F.C.S., F.R.P.S.

THE THEORY OF DEVELOPMENT.

II.

I now come to the consideration of the theory of development proper, that is, the action of the developing solution in forming the visible image, and, though it is not, strictly speaking, a part of the subject, we shall have to glance briefly at the various theories of the action of light in preparing the way for development.

Mr. A. D. Pretzl has recently referred to an article of mine, published in 1870, in which, while I attributed a purely chemical action to alkaline pyro, silver development, or, as we now term it, "physical," was, partly at least, ascribed to electrical action. When that article was written, I was, as I am now, strongly of opinion that, if our knowledge were only wide enough, we should find a purely chemical explanation for every single point in connexion with the action both of light and development; but at that time, although the action of alkaline pyro seemed to me clear enough, the deposition of the silver on the film in physical development did not seem to me explicable, except on the supposition of some electrical attraction resulting from the action of light; or, in other words, I recognised, or thought I did, two distinct effects, the one chemical, the other physical. Perhaps now I can agree with Mr. C. H. Bothamley that, when an experimenter comes to a problem he cannot understand, he attributes it to electrical action.

There are supporters of both the chemical and physical theories, either or both of which may be correct, for it is quite possible that there may be two distinct effects produced by light; but, though at the period I speak of the physical theory was the more generally propounded, I think of late years the tendency is rather in the direction of the chemical, the immediate action of light being held to result in a partial decomposition of the silver haloid, instead of an electrical or molecular disturbance of the particles.

So far as chemical development is concerned, there seems little reason to go beyond a purely chemical explanation of all the phenomena, since the supposed formation of a sub-haloid, whether it be possible to isolate it or not, meets every requirement of the case. That the subsequent action of the developer is to completely eliminate the halogen scarcely requires demonstration, and the first step in the direction of that purely chemical act would certainly seem to be more probably chemical than physical; but, when we turn to the alternative method of development, in which the original haloids are left intact, and the image is formed at the expense of the developer, or, at least, of the free nitrate of silver, which practically forms part of the developer when it is in action, there has long appeared to be a difficulty in accounting for the deposition of the metal only on those parts of the film where the light has acted without having recourse to some electrical or other physical form of attraction. Of these the electrical always appeared to me the more reasonable, for some of the earlier hypotheses, based upon molecular "disturbances" and "vibrations," were, I venture to think, fantastic, if not absurd, in their conception. For instance, one theorist likened the exposed film to a tray of pebbles varying in size according to the degree of isolation, the whole in a state of rapid vibration, after the style of cinder-sifting, and the metallic silver in the act of deposition from the developer was supposed to be in the form of fine sand. When this shower of "sand" fell upon the tray of vibrating "pebbles," it was shaken down into the interstices, a greater quantity finding its way between the larger pebbles, where the light had acted most powerfully, and so on, in proportion to the variations in size, thus forming the gradations of the picture. The idea was, no doubt, ingenious, but, at the same time, rather comical.

It is a long time since I last saw the article which I have referred to; but, speaking from memory, I think I based my idea of electrical attraction upon some experiments alleged to have been successfully made by Mrs. Mary Somerville and Morichini, but repeated with negative results by others. In these experiments fine needles, one-half of their length covered with opaque cardboard, were exposed to sunlight under blue glass and also to the blue rays of the spectrum, when they became magnetic, the exposed portions forming the positive pole. It appeared to me, failing any other explanation of the phenomenon, that some such action would serve to account for the deposition of the reduced silver of the developer upon those portions of the film that had been impressed by light, but I am free to admit that I should have much preferred to have found a chemical explanation.

At the time I wrote, and indeed until I saw the passage quoted in Mr. Haddon's recent paper, the hydrogen theory of wet-plate development published in Brande and Taylor's *Chemistry*, was quite unknown to me but, looking at the question from that point of view, I do not think it is at all impossible to reduce even "physical" development to a purely chemical process and to dispense entirely with all ideas of electrical disturbance or attraction. By this I mean that I think I can at any rate partly see the way to explain how the reduced silver is chemically deposited on the exposed portions of the film, though I am far from claiming that my suggestion forms anything like a complete solution of the difficulty. It is, in fact, offered only as a suggestion.

We start with the idea that the action of light is to reduce the iodide or bromide of silver to the state of sub-iodide or sub-bromide. In the presence of excess of silver in the wet plate, the liberated halogen will be taken up by the free silver, or, in the case of a dry plate, by some other absorbent, which, as Mr. Haddon has pointed out, is absolutely essential to the formation of a developable image. In the case of a wet plate, it may be supposed that the liberated halogen is instantly seized by the free silver in and on the surface of the film, with the result that fresh iodide or bromide of silver is formed, and this may be partly mixed with the sub-iodide or sub-bromide if the film be rich in silver, or, more probably, it will be formed on the surface, to which it is attracted by the layer of silver solution.

W. B. Bolton.

OUTSIDE STUDIO WORK.

VI.

In previous articles I have referred to a few of what may be termed unusual classes of subjects a photographer has to deal with, and the accomplishment of which requires the use of other than ordinary kinds of apparatus.

There is another class of subject which at first sight, to some operators, may appear easy enough in accomplishing, but which, on fully thinking over, entails some risk of failure, provided no previous experience has been acquired at similar work. I refer to the photographing of the launching of ships. No doubt there are many instances where such is capable of being executed without any serious trouble or liability to failure, such as where every facility is afforded a photographer beforehand for undertaking the work in well-appointed ship yards; and, when this occurs in conjunction with a light that suits the occasion, both in direction and brilliancy, the function is generally one that affords

much pleasure to a photographer; but how often does it happen that such favourable circumstances fall to the lot of an operator? There are launches and launches, and there are ship yards that are so situated as to make it almost impossible to work other than directly in the eye of the sun, or up against even a very poor light. It has been well said that time and tide wait for no man, and, in the launching of ships, a photographer has little or no choice in the matter but to select the most convenient spot he can, and trust to luck for the light. I have said there are launches and launches; by this I mean there are a class of launches of which the general public and thousands of photographers have no absolute knowledge or experience of. I do not now refer to the commonly understood idea of launching a vessel, by means of allowing her to glide gracefully down the way until she reaches her native element. When such a launch takes place, there is plenty of time and opportunity for a cool-headed operator to act with caution on some well-thought-out plan, such as the previous selection of the exact spot the hull should occupy when the shutter is set free. These may be properly termed slow launches, and, with ordinary precautions, offer no insuperable difficulty in accomplishing. There is another class of launches, however, which it has fallen to my lot to photograph for many years back, to accomplish which successfully calls for at least some experience in this particular kind of work, for the entire operation of launching such vessels is quite different from the sending a vessel slowly down the ways into the water; and any one who has never seen the kind of launching I refer to cannot possibly form anything like an idea of the enormous speed or velocity vessels are made to take the water. I refer to the launching of large and small-sized vessels broadside into the water, an example of which may be seen in the *Strand Magazine* for September, 1896. The launching of vessels broadside into the water is, of course, only resorted to in situations when there is no room to send them down the ways end on; but it is a very common practice in some parts of Scotland, especially at Paisley, on the Cart, and in several instances on the Forth and Clyde Canal, such as at Kirkintilloch, where steamers of considerable dimensions are regularly built and launched in this manner. An operator who imagines that there will be ample time to study well the appearance of a hull in the act of being sent into the water broadside, will certainly stand aghast and look very foolish when he finds the whole thing over before he has time to release his shutter. The first time I was face to face with work of this kind, I was told that I would not have any time to come and go on, so fast did the large hulls travel into the water, but I certainly had no conception of the enormous velocity with which a ship is made to jump from dry land into the stream. Jumping is the most suitable expression I can find to convey anything like an idea of the speed of the operation to my readers.

In the illustrations referred to as published in the *Strand Magazine*, when I photographed the launching of this large-sized steamer broadside on into the River Cart, I can safely assert that a period of not more than three seconds was allowed to transpire between the time the dagger was withdrawn and the hull struck water. The speed with which this huge mass jumped into the water was simply appalling. No one could conceive it without having had previous experience of similar launches, whilst, from a spectacular point of view, it is grand in the extreme, clouds of spray being driven as high as the housetops. I had occasion to photograph one of these launches at Kirkintilloch about a month ago, and I think they were jumping them in faster than ever.

The speed being so great, it stands to reason every preparation must be made beforehand, and the lens focussed on the exact spot in the water which the hull is likely to occupy; here, again, mistakes are almost certain to follow a want of experience. The first launch of this description I had to photograph showed me plainly that the hulls don't jump so far into the stream as any one would imagine, and the liability of choosing a position too near the middle of the stream for the hull to strike at is very likely to happen if the operation has not been previously witnessed. The true point where these hulls strike the water is much nearer the bank upon which they are built than many would imagine. It is here they strike first with such frightful velocity, throwing up immense sheets of water that often rise over the decks, and which is by the roll or force of contact driven into immense clouds of spray. After the first impact with the water, the huge mass, for just a moment, takes a diving motion, then as quickly recovers again with a rolling motion, and finally settles down motionless in the middle of the stream, the whole thing being over in an incredibly short space of time, totally unlike the slow graceful motion of an ordinary launch end on. Such launches as I am referring to call for a cool head and certain preparations beforehand, such as the arranging for the signal being given to stand by already at the supreme moment, when the final dagger is withdrawn. When this is given, there is not a moment to lose, and by this time, the shutter ought to have been set, and the door of the dark slide withdrawn, the plate being free for exposure. In other cases I have had to execute launches of this kind, where the supreme moment consisted in the cutting of a strand by a sharp axe. In this instance, a gleam of the steel as it rises in the workman's arms is seen, then a thud and a cut, and the monster mass, uncontrolled, leaps into the water in a single second. It is in work of this kind that the benefit of absolutely sound practical apparatus is seen. I am far from decrying the use of any shutter that is constructed with a flexible blind, for I know quite well that such handy shutters have done good work, and are very convenient, but I know likewise that I can point to failure clearly attributable to such fogging an extremely sensitive plate, through the absolute necessity of the door of the dark slide having to be withdrawn for a long time, leaving no protection to the plate, but the blind of the shutter. "Once bitten, twice shy," is an old but very true saying, and so I never think of trusting a fast plate to a shutter that, in any sense, is liable to a pinhole, or to pass light in any way. These remarks apply also to cameras, and especially the bellows and fronts of the same. All apparatus must be in perfect condition to permit of a very fast plate being exposed for a lengthened time of uncertainty inside the camera, waiting the moment of exposure; if there is any weak point about the bellows, camera, lens fittings, or shutter, I know of no greater test than to expose a plate inside such for say fifteen minutes, when the apparatus is fitted up in strong sunlight outside. I am aware there are innumerable cases where the cap of the lens may be utilised to protect a plate when the shutter alone stands between such and the daylight, or a good felt hat may be made to do duty in this matter, but in work of the kind I am referring to, even such an act as the removing of a cap from the hood of a lens is not to be thought of, for an operator should have positively nothing to do but release the shutter. "Funk" is a word vulgarly used sometimes in connexion with photography, but I often think there is a great deal of it going about these times, and the best means I know of avoiding it, is to have nothing to get into a funk about. In this class of work, however, it is very liable to happen if the most complete and simple arrangements are not all made beforehand.

T. N. Armstrong.

PHOTO-MECHANICAL NOTES.

In the making of a suitable negative for the half-tone process the so-called "cutting," or clearing, is largely resorted to in wet-collodion work by the most practical operators, and especially by those operators who follow American methods, and much of the sharpness, cleanliness, and vigour of American half-tone work is due to this operation.

In brief, the operation of "cutting" is the application of a solution of iodine after the fixing and washing of the plate, and following up the iodine with a weak solution of cyanide of potassium. It will be seen from subsequent remarks that the two solutions can be combined, but in any case the principle is the same, the silver in the film is converted into the state of iodide, in which condition it is readily attacked by the cyanide in the parts where the deposit is weakest.

It must not be supposed that this action is one of reduction, and that the general density of the plate is weakened. Such would be the case if we were dealing with ordinary negatives taken without the screen, but in a negative consisting of half-tone dots the action of the iodo-cyanide is a distinct improvement, without any disadvantage whatsoever. At the same time it is to be understood that the operation would be of little avail unless followed by intensification. This may seem strange to those unacquainted with the practice of half-tone negative making, as it appears very like taking away part of the silver deposit by one operation and replacing it by another. Such, however, is not the case. What happens is that we remove the deposit from a part where it is not wanted, and build up a fresh deposit where it is wanted.

To fully understand the reason for the practice, a screen negative should be examined under a microscope or powerful glass after development. It will then be seen that the dots consist of little heaps of silver granules; in the centre of the dot the granules lie thickest and form absolute density, but towards the edge there is a gradual separation of the granules, forming a sort of fringe of imperfect density round the opaque part of the dot. Scattered granules will also be seen over the parts between the dots, where there should be transparency, these stragglers really forming a veil. Now, the result of the iodo-cyanide application is to remove this fringe and veil, and thus the dots are very much sharpened, whilst the spaces around them are rendered exceedingly transparent. It will be well understood that any intensification that follows can neither veil the clear spaces nor enlarge the dots, but will rather increase the

opacity of an already fairly opaque dot, and especially the opacity at the edges, so giving the effect of sharpness.

For photo-etching and photo-lithographic printing processes, where the parts representing the whites of the picture have to be washed away from the print, this sharpness is very essential for securing clean and vigorous work. In the enamel process keen-edged dots and clear spaces are indispensable qualities of the negative, without which the process bristles with difficulties. Thus the importance of the operation of "cutting" in negative-making cannot be under-estimated, and some hints on the practice of it will not be out of place.

There is only one possible way of making up the iodine solution, and that is to take one grain of iodine and two grains of iodide of potassium to each ounce of water; iodine being sparingly soluble in water, the addition of potassium iodide is necessary to bring about perfect solution.

The potassium-cyanide solution should be one in forty as a stock strength, a little being taken and diluted to suit the character of the negative.

Those who prefer to have the two solutions combined should make them up separately as above, then take a third bottle of pint capacity, and pour into it fifteen ounces of water. Add to this sufficient of the iodine solution, drop by drop, until the water assumes a sherry colour; then add the cyanide a little at a time until the solution is decolourised.

A method of working which is sometimes preferred, because giving more control over the "cutting" solution, is to keep the iodine and the cyanide in separate dropping bottles, and make up the dilute combined solution in a measure at the time of development.

It is a moot point whether the "cutting" should be done before or after intensification, but the most general practice, especially in using the copper intensifier, is to apply the iodo-cyanide after intensification, according to the following routine.

The negative is, after fixing and washing, bleached with the copper bromide solution, and then blackened with nitrate of silver. It can at this stage be determined by examination with a magnifier what amount of "cutting" is required. If the iodine is used separately, it is flowed over after the plate has been well washed. It is not necessary to allow the iodine to act until the whole of the image is converted into iodide of silver. As soon as there appears a greenish-blue tinge in the shadows, the treatment with iodine is stopped and the plate well rinsed, after which the cyanide solution is flowed on. The action on the light-coloured image can be watched by holding the negative over some dark object, the bottom of the washing tank being usually black enough for the purpose. A further good washing follows, and, if the negative seems nearly right in density, a solution of hydrosulphuret of ammonia of the strength one in twenty is flowed over. This gives intense blackness to the dots, and, though its use may be dispensed with, there can be no doubt the negatives are better after this treatment. There is, besides, the important advantage, that by treatment with the hydrosulphuret the image has not the tendency to set off on the printing plate as it does with the copper deposit alone, if the slightest trace of moisture is present.

Assuming that after the first application of the copper and silver and the cleaning with iodo-cyanide the negative does not look right, that is to say, the dots in the shadows seem rather weak and the high-light dots are not joined enough, the practice is to again apply the copper and silver and again "cut" with iodo-cyanide. It is, in fact, often necessary to make these applications a third time, finally applying the hydrosulphuret to complete the process.

This possibility of repeated intensification, or "building up," is one of the great advantages of the copper-silver intensifier. With mercury or lead it would not be possible to do this without blocking up or staining the transparent spaces.

So far, we have dealt with "cutting" and intensifying as applied to the wet-plate process, but the growing use of dry plates demands an analogous process. This cannot be entirely supplied, as the constitution of a gelatine film charged with silver bromide is so widely different to the collodion one. In the latter case the silver is deposited on the surface, and is therefore easily reduced or added to, so that it is more amenable to the methods we have described than is a dry plate, in which the silver is diffused throughout the film and is under the surface. The "cutting" solution must therefore penetrate the gelatine in order to attack the silver. The most satisfactory reducing solution for the purpose is by the ferridcyanide and hypo formula, but in practice we find it best to leave out the hypo, making up a sixty grains to the pint solution of ferridcyanide. We do not thoroughly wash the plate after the hypo fixing bath, leaving a sufficient trace of hypo in the film to bring about a mild reducing action, which is well under control and can be readily watched. In this way we are able to secure a very similar action to that in the wet-collodion process; but it will be found that the "cutting" cannot be carried quite so far, for, if the shadow dots are reduced to the same minuteness as in the wet plate, it will be found that the shadows are very liable to block up in printing, though the dot may look just as dense as in a wet-collodion plate. The explanation probably is that the dot has an apparent density because the silver is diffused through the film and has a sort of backing-up effect, but the dot is structurally weak to the sideways action of the light which gets under it just as the acid undercuts in etching. Thus it will be found best to leave the dot larger on the negative than it is intended to print, and so allow for the lateral action.

Lately I have been trying the iodo-cyanide reducer, as used in combined form for wet collodion in the way described above, and have found it yield very good results on gelatine plates.

The "cutting" must be followed by intensification, or the full effect will not be attained, in fact the negative may be quite unprintable by the enamel process if not intensified. Unfortunately we cannot use the copper intensifier on dry plates so well as on wet collodion, owing to the liability to leave a stain. A preferable intensifier, which is very similar in its action, is that by the cyanide of silver formula. I know there is a good deal of divergence of opinion as to its merits, but much depends on the way it is made up. In my own experience I have found the following formula answer very well:—

No. 1.

Bichloride of mercury	100 grains.
Bromide of potassium	100 ,,
Water	10 ounces.

No. 2.

Nitrate of silver	100 grains.
Cyanide of potassium, pure	100 ,,
Water	10 ounces.

In making up the No. 2 solution much depends on the strength of the cyanide. If not of full strength, it will not dissolve the precipitate of silver. The best way to make up the solution is to dissolve the silver in half the quantity of water and the cyanide in the other half, then adding the cyanide to the silver solution. If the first precipitate is not re-dissolved, add more cyanide until only a very slight precipitate remains and the solution is slightly grey. By the two latter signs it will be known that the cyanide is not in excess; if it were, the solution would act as a reducer rather than an intensifier. The image will be turned quite black, and on examination of the dots they will be sharply defined, dense, and well joined—that is, if all other conditions have been right. The want of sharpness of the dots in the dry plate is often ascribed to the gelatine dry plate itself, when it is really the operator, who does not know how to set the distance of the screen and determine the size and shape of the diaphragm.

WILLIAM GAMBLE.

PHOTOGRAPHIC CHEMISTS AND PHOTOGRAPHERS.

THE prosecution by the Pharceutical Society of two well-known Edinburgh dealers for selling "scheduled poisons," and using a restricted title, is the cause of a great deal of ill feeling. It will be a pity, indeed, if the result is not some action or agitation to restore an equilibrium, so that we may all have our rights in the matter. Personally, as a consistent reader of newspapers generally, and the drug and photographic journals in particular, I see no prospect of anything like "free trade" in poisons; judging by the frequently expressed remarks of sapient coroners and their juries, there is more chance in favour of further restriction—see the recent recommendation *re* pyrogallic acid.

I don't think myself that the chemist is quite fairly dealt with in this and other matters. Just consider for a moment. He passes a preliminary, serves an apprenticeship, and is then admitted to a pretty stiff (judging by the failures) examination, comprising botany, chemistry (organic and inorganic), including analysis, pharmacy, materia medica, and physics, and, on occasions anything else that happens to be of scientific interest at the moment to the examiner, as, for instance, isochromatic photography or Röntgen rays, and all for what purpose? To enable him legally to retail a few poisons, which, to put it plainly, are more bother than they are profit, while his position, and the fact that he has conformed to all regulations in selling, is no safeguard against possible ignorant abuse and bullying from certain coroners, who, as dozens of cases prove—in fact, they are of weekly occurrence—make a law unto themselves in this matter, and do not trouble to study or even refer to the Act which is supposed to be a safeguard to both seller and buyer.

Apart from this doubtful privilege, what remains? Pharmacy, *i.e.*, the compounding and dispensing of medicine, is, to the great majority, a merely pleasant fiction; for, the fact is, the doctors already do the bulk of their own dispensing, clubs and dispensaries do the rest. The chemist therefore, with an average of two or three prescriptions a day, fills up his time, and tries to get a living by the sale of all sorts of outside stuff:

perfumery and soaps, photographic apparatus, paints, hardware (I have seen the half of a chemist's shop lined with *chamber utensils!*), stationery, toys, and firelighters—anything, in fact, likely to sell and yield a little profit.

The main trouble, of course, arises from the fact that the man is not *sufficiently* protected. A writer once more compares the English with his foreign *confrère*, much to the disparagement of the former; but he artfully conceals the facts, that in France and Germany *the dispensing of prescriptions* is confined to the pharmacist, and that the *number of pharmacies* is restricted by law. *Per contra*, the man has to confine his operations to his own profession.

The rightful position of the pharmacist is midway between the doctor and patient. It is the business of the doctor to prescribe, that of the chemist or pharmacist to dispense; and, briefly, if this were done in all cases, the chemist would have enough to do without bothering with "outside shows."

It is contrary, in my opinion, to all ethical rules for the doctor to prescribe and dispense his own prescriptions. Many medical men relegate this work to their wives, sometimes to the page boy—very few keep a qualified dispenser. *It is not right, and it should be illegal, for the person who makes up the physic to sign the death certificate.* But this is done daily.

Suppose the doctor's dispenser—his wife maybe—makes a mistake, with fatal results, is it likely that the world knows of it? I have a great admiration of our medical men, a more honourable set of men does not exist; but they should be guarded against the remotest possibility of any such catastrophe; and he would be a bold man indeed who would assert that such mistakes have never occurred. D. D.

WOODFORD PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The Third Annual Exhibition of work of the members of the above Society was held on Saturday, November 21, at the Club-room, Coffee Tavern, George-lane. As last year, it was extremely well patronised, the room being for a long time uncomfortably packed, notwithstanding that the Exhibition was opened earlier and closed later than in former years. On entering the room, one was struck by the prevalence of darker tones. This was somewhat added to by the material that formed the background for the pictures, and which had a quiet, pleasing effect, and helped to bring all the pictures well into relief. The number of pictures shown was about the same as last year, and, as before, a few workers stand out conspicuously from the rest. Mr. Noble may be placed foremost, four of his batch being of very high merit. One picture, representing some children paddling in the sea, and another showing a lifeboat near the shore, with the surf very troubled, were exceptionally good. Two others, panels of flowers, enlargements on Alpha paper, about 15 × 9, were beautiful examples of careful work, rich in colour and delicate to a degree. Mr. Malby was well represented, as usual. His exhibits consisted of some nice specimens of portraiture and some enlargements in platinum, two of which deserve special notice; the first a view of Hastings beach, and the other Winchelsea Church.

Mr. H. Wilmer's contribution consisted of some seascapes. These were from sketches by Mr. W. L. Wyllie, A.R.A., and were very good examples of the photogravure process. He had also a small landscape, the name of which was not given, but it was one of the best in the Exhibition.

Mr. Marriage sent a somewhat mixed lot for him. Architecture and architectural details being his *forte*, it was here where his best work was to be found, the capitals of two pillars, the same as were shown at Pall Mall Exhibition, being the best. One or two smaller frames contained some nice landscapes which by no means detracted from Mr. Marriage's reputation as a clever and careful worker.

Mr. Emler, the Secretary, was a generous contributor, no less than fourteen frames being sent by him. All his exhibits but one were in platinotype, and comprised pretty bits in North Wales, Epping Forest, and Knighton. One photograph of some rhododendrons was very nice, while two or three of Bontddu, in North Wales, showed care both in selection of subject and the after-operations of production of print.

Mr. Caird was represented by a number of bromide enlargements, *A Scottish Glen* being the best; it is a nice piece of work. The others were mostly *genre* subjects. The Rev. N. R. Fitzpatrick contributed three enlargements on bromide paper, *Treib*, *Lake Lucerne*, being very good. Mr. Billings sent a few small things. These were mostly pretty scenes in the Isle of Wight. One, *The Smithy*, is a very creditable piece of work, more especially when we consider the great difficulty attending such work. The gradation of tone was all that could be wished for. Mr. Steriker had two or three nice things, the larger and perhaps best was a picture of *York Minster*. Mr. Hooper sent a few portraits, and one or two landscape scenes in the Lake country. Mr. Goodwin had a couple of frames, the *Retro-choir at Chichester Cathedral*, and a small seascape, both being very creditable pieces of work.

One of the features of the Exhibition was an arrangement for the display of transparencies and lantern slides. These were much appreciated, and, for a greater part of the evening, attracted a good deal of attention. Transparencies of all sizes were shown, which came as a change to ordinary and almost too familiar lantern slides.

Looking at the Exhibition as a whole, the standard of the work was well up to the average of past years. It was fairly representative of the members as a body. The work of one prominent member was missed, but this was somewhat compensated for by the contributions of some younger members, who work on almost identical lines. The Council have every reason to congratulate themselves upon the display, which is the culmination of another year's good and successful work.

THE NORTH MIDDLESEX SOCIETY'S EXHIBITION.

The Eighth Annual Exhibition of this Society was opened on Monday, the 30th ult., with a *Soirée* for members and their friends, and remained open to the public on the two succeeding days. The North Middlesex Society, unlike the Hackney and most of the other large suburban societies, limits its annual show to the work of its own members, and offers to them even no medals, gold, silver, or bronze, but merely places at the disposal of the Judges a number of certificates of equal value. The Judges on this occasion (Colonel J Gale and Mr. F. P. Cembrano) made six awards, which were not characterised by more then the usual amount of eccentricity, although the reasons for some of them were hard to find. In their report these gentlemen say that they "are pleased to find so high an average in the Society's work. They would have been gratified to see greater attention paid to the lantern slides. The framing is, on the whole, harmonious; at the same time some meritorious work is marred by unsuitable mounts and frames." By way of emphasising this last remark, they select the only print out of Mr. S. E. Wall's four which contains an obvious technical defect for a certificate. The print in question (No. 152), *A Cool Retreat from Noontide Heat*, is mounted on a cut-out mount, which is painfully untrue in its lines. Mr. S. E. Wall's other work, especially (No. 2), *On Crymlyn Burrows*, is fully up to his usual high level of excellence.

Perhaps Mr. J. C. Mummery, the able and energetic President of the Society, has, as is only fitting but very uncommon, the finest exhibit of any one individual. He is particularly to be congratulated at having broken away from the lines of composition which at one time seemed to trammel him—a defect we pointed out in these columns only a few months ago; and, while his Pall Mall works with the old familiar figures are here also, he has in No. 53, *Misty October*, and in No. 181, *The Meadow Lane*, two charming examples of subjects which photography renders so well. *Misty October* is a clump of heather gradually shading off into a hazy background of trees. The various planes are well rendered, while the treatment of the *tout-ensemble* is broad and harmonious. (We have had this sentence specially written for us by an art contributor to a contemporary.)

No. 39, *Sunshine in the Woods*, by Charles Beadle; No. 58, *By Sea and Shore*, by W. B. Goodwin; No. 139, *The Yare, Early Morning*, by A. J. Golding; No. 144, *Home, Sweet Home*, by A. H. Liscett, and No. 24, *A Hamlet*, by J. C. S. Mummery, have also received certificates.

The North Middlesex Society is to be congratulated on having got together a really excellent show, one which is certainly the best it has ever held, and is, moreover, in all probability the best collection of the work of members of any one society ever got together, while it is well to note that this has been done without the offer of a medal. In addition to those we have already mentioned, Messrs. J. Addison, F. W. Cox, C. Dawkins, J. W. Marchant, E. R. Mattocks, J. McIntosh, W. J. Simpson, H. Smith, C. R. Steele, H. Stuart, W. Taylor (Hon. Secretary), and H. Walker exhibit works which attract attention, while other members of the Society show many excellent examples of their work.

The lantern slides are, as suggested by the Judges, poor, and this has always been a weak point with the Society. Those sent in for competition were exhibited in the lantern on Tuesday.

On Wednesday Colonel J. Gale delivered a lecture, *Under the Broad Skies*, illustrated by the lantern.

Our Editorial Table.

Bromide Paper.

By Dr. E. A. Just. London: Percy Lund, Humphries, & Co.

This is the fourth edition of Dr. Just's book. In what respects it differs from the editions that preceded it we are unable to say, but the work appears to be very exhaustive, every one of the manipulations demanded in contact printing or enlarging with bromide paper being very minutely entered into. But, from the fact that neither amidol nor metol as developers for bromide paper is alluded to, we conceive that Dr. Just's book, excellent though it be, requires bringing up to date. No doubt, a fifth edition, when called for, will supply the omission noticed.

THE PHOTO-AMERICAN (Vol. VII., Nov., 1895, to Oct., 1896).

New York: Charles H. Loeber.

THE seventh volume of our contemporary, neatly bound, well printed and illustrated, makes a book of excellent photographic reading. Most of the articles are from English sources, having originally appeared in our own pages and those of our contemporaries, and, as nice judgment has been exercised in their selection, it will be perceived that the *Photo-American* occupies a unique place among photographic periodicals, and possesses a distinctiveness by which none other is characterised.

THE SHAKESPEAREAN.

London: Dawbarn & Ward.

THE November copy of this little review apprises us that it is now issued by Messrs. Dawbarn & Ward. *The Shakespearean* is full of matter of interest to students and admirers of Shakespeare. Mr. A. H. Wall has the first of a series of articles on Shakespeare's portraits, and the frontispiece is a photograph of the Davenant bust, by Mrs. Weed Ward.

THE PAGEANT FOR 1897.

Edited by C. H. SHANNON & GLEESON WHITE.

London: Henry & Co., 93, St. Martin's-lane.

IN the way of typographical and pictorial excellence this refined and handsome annual would be difficult to surpass, while such details as binding and paper have been attended to with the most conscientious desire to produce an artistic result. *The Pageant*, however, is not one of those annuals that appeal to the multitude; it is obviously designed for persons whose preferences soar above the "usual thing" in the way of midwinter literature. Art "appreciations," stories, poems, a play, a note on wood engraving supply variety of contents, the chief authors being Edmund Gosse, Victor Plarr, D. McColl, the Editors, Maurice Maeterlinck, Max Beerbohm, Angus Evan Abbott, &c. Among the illustrations are reproductions by the Swan Engraving Company of pictures by Moreau, D. G. Rossetti, Burne Jones, C. H. Shannon, Puvis de Chavannes, Watts, and others. *The Pageant* makes a superb gift-book, to which persons of artistic sympathies may pleasurably return again and again.

THE INTERNATIONAL ANNUAL OF ANTHONY'S PHOTOGRAPHIC BULLETIN, 1897.

Edited by F. J. HARRISON.

New York: E. & H. T. Anthony & Co. London: Percy Lund & Co.

MR. HARRISON atones for the exiguity of the purely editorial portions of this well-printed annual by the good quality that distinguishes its many half-tone and other illustrations and the practical value of the contributed articles that he inserts. These articles are of unusual interest and emanate from American, English, and Continental photographers, among whom we note Bogardus, Bothamley, W. K. Burton, W. Gamble, M. J. Harding, Romyn Hitchcock, S. H. Horgan, Joé, F. P. Liesegang, Neuhauss, Rev. T. Perkins, Victor Schumann, Matthew Surface, Valenta, Waterhouse. The photographic tables and formulæ are of great utility. We must not omit to mention that a section is devoted to articles on process work, and, appropriately enough, the process blocks come out exceedingly well. It is altogether a capital book.

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, December 8, at 12, Hanover-square, at eight p.m. *Dr. Selle's Process for Natural-colour Photography*, illustrated, by Dr. Neuhaus.

AN INTENSIFIER.—Mr. W. T. F. M. Ingall writes and suggests the following plan of intensification:—In water, 20 ounces, dissolve potassium sulphite, 20 grains, then add mercuric chloride, 35 grains. Wash and redevelop. The results are brilliant and dense.

HASTINGS.—A short stay recently at this popular winter resort revealed to us the presence there of a large number of amateur photographers actively engaged in camera work. Coupled with this observation, our own experiences of photography in the bright, clear weather more than ever impressed us with the conviction that, in entirely abandoning camera work in the winter months, amateur photographers neglect many excellent opportunities of obtaining photographic pictures. We availed ourselves while at Hastings of the well-appointed photographic stores of Mr. Algernon Brooker, of Harold-place. Mr. Brooker is one of our best-known and most successful workers, and he not only keeps a well-selected stock of photographic requisites, but his practical knowledge and advice are freely placed at the disposal of those who seek them.

THE Aintree Photographic Society held their first Smoking Concert on Friday, November 27, from 130 to 150 members and their friends being present. Mr. J. Harvey Farmer, C.C., occupied the chair. Mr. A. J. Canfield and Mr. Manod Owen (both members of the Society) sang "The Village Blacksmith" and "Loch Lomond" respectively, each item being illustrated with appropriate views by aid of limelight, and which was the success of the evening. Other members, assisted by several gentlemen from Liverpool, contributed songs and recitations. Mr. George A. Ashley acted as lanternist.

"THE CHRONOPHOTOGRAPHE."—At the next weekly meeting of the Photographic Club, to be held at Anderton's Hotel, Fleet-street, E.C., on Wednesday, the 9th inst., M. L. Gaumont will exhibit, for the first time in London, his new apparatus for the projection of animated photographs. It is a Members' Open Night, and Mr. Charles Wallis will show slides from negatives taken on his holiday trip. Visitors are admitted to the meetings of the Club on the personal introduction of a member or by invitation cards, which the Hon. Secretary (Mr. F. A. Bridge, East Lodge, Dalston-lane, N.E.) will be pleased to forward on application.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY'S EXHIBITION.—After an interval of nearly two years this Society held an exhibition of its work on November 24, 25 & 26. The character of the exhibits was very gratifying, and showed a very decided advance upon that of previous years. Competitions were held in five classes, and the Judges (Mr. C. B. Keene and Mr. J. W. Wade) awarded the medals as follows:—Open Class (Landscape) silver, P. S. Lankester; bronze, G. Bankart. Quarter-plate Work.—Silver, W. J. Coates; bronze, W. E. Dunmore. Half-plate Work.—Silver, W. J. Coates; bronze, E. B. Miles. Instantaneous Work.—Silver, E. B. Miles; bronze, W. J. Coates. Lantern Slides.—Silver, G. Bankart; bronze, W. J. Coates. A large number of non-competitive prints were shewn, including work in carbon by the President (Mr. G. Bankart), platinum and carbon by Mr. Porritt, portraits in platinum and carbon by Mr. Frank Brown, and many others.

WRITING CHRISTMAS-CARD VERSES.—In the Christmas number of the *Windsor Magazine* Mr. Adolph Tuck gives his views on the style of verse most suited to Christmas cards: "It should not be too poetical. By that I mean it should not be involved or obscure in its allusions. We need verses that can be read at a glance and understood at the same time. They should read smoothly and rhyme correctly. Each should contain a simple appropriate sentiment of a friendly character; but the word 'friend' should be strictly tabooed. Then, it is essential that they should be quite general in character. As I have already said, any sentiment which would only apply to special circumstances or relationships would be fatal to the success of a card. The sentiment should not be especially Christmassy. We find practically no demand for the old-fashioned card, with a robin and a spray of holly. The favourite designs at the present day have no special reference to the season, and it goes without saying that the verse should agree with the design. You will be interested to know that about two years before Lord Tennyson's death I offered him a thousand guineas if he would write us eight Christmas-card verses. He sent me a polite refusal, though I have reason to know that he did not resent the proposal."

PLATINUM.—The following paragraph appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY some months ago: "*New Source of Platinum.*—The precarious nature of the supply of platinum was well shown a year or two ago, when a small combination was able to 'bull' the price of this metal till, from a sum below 1*l.* 10*s.* an ounce, it rose by leaps and bounds almost to the value of gold. It will therefore be good news to photographers that a new source of supply has been discovered of such large area that it may fairly be expected to bring down the price to a level never before reached. We read that in New South Wales a bed of platiniferous lead over a mile long has been discovered. It has been known for some time past that the metal was to be found, but it had not been properly worked. It is stated that the platinum is to be present to the large extent of 75 per cent." Since this appeared, many other photographic and scientific journals have published similar information, and their writings have been recently copied by some intercolonial journals. From personal inquiries made at the Department of Mines of New South Wales, Sydney, we are in a position to state that no such extensive find of platinum has been made in the colony, and at the present time the value of this metal is nearly equal to gold.—*Australian Photographic Journal.*

Patent News.

THE following applications for Patents were made between November 18 and November 25, 1896:—

CAMERAS.—No. 25,730. "Improvements in Photographic Cameras." A. KERSHAW.

HANGING SCREENS.—No. 25,766. "A Mechanical Contrivance for Determining the Angle at which Optical Lantern Screens should be Hung." F. O. SCOTT and J. DAVENPORT.

COPYING APPARATUS.—No. 25,783. "Improvements in Apparatus for Copying or Transferring Photographs." Communicated by the "Neue Photographische Gesellschaft. Complete specification. G. A. DE KATOW.

PHOTOGRAPHS ON FABRICS.—No. 25,980. "Process of Printing Photographs on Textile Fabrics and Solutions connected therewith." Communicated by the International Photographic and Supply Company. Complete specification. J. LIDDLE.

CHANGING BOXES.—No. 26,160. "Improvements in Photographic Change Boxes." J. HOWSON.

PRINTING.—No. 26,234. "An Improvement in Producing Photographs and the Like." A. SCHWARZ.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

December.	Name of Society.	Subject.
7	Bradford	*Conversazione* and Exhibition.
7	Camera Club	Smoking Concert.
7	Ealing	*Pictorial Photography.* Horsley Hinton.
7	North Middlesex	Informal Meeting.
7	Putney	*Holiday Rambles with a Camera.* John A. Hodges, F.R.P.S.
7	Richmond	Lantern Evening, Slides by E Dockree.
7	South London	*Isochromatic Photography.* The President.
7	Stafford Y.M.C.A.	Open Lantern Meeting.
8	Birmingham Photo. Society	Exhibition of Photographs in Bromide, Platinotype, Carbon, &c. P. T. Deakin.
8	Royal Photographic Society	*Dr. Selle's Process for Natural-colour Photography.* Dr. Neuhaus.
9	Ashton-under-Lyne	Conversation on the Exhibition Pictures of 1896.
9	Borough Polytechnic	Conversation Night.
9	Camera Club	Testing Lantern Slides.
9	Croydon Camera Club	Council Meeting.
9	Leeds Camera Club	Beginners' Lecture.—IV. *Squeegeeing and Mounting* Mr. Swinden.
9	Leytonstone	*Bromide Enlarging.* F. W. Watee and M. D. Kerr.
9	Photographic Club	*My Holiday Trip.* C. Wallis.
9	Southport	*Negative-making.* Chapman Jonee, F.I.C.
10	Liverpool Amateur	Annual Meeting.
10	West Surrey	*Bromide Printing.* Mr. Price.
11	Croydon Microscopical	*Stripping Films from Broken Negatives.* A. Roods.
11	Ireland	Demonstration in Platinum Printing. Alfred Werner. — Lantern Views J. H. Gane.
11	Plymouth	*Multiple Film Plates.* J. T. Sandell.

ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 24,—Ordinary Meeting,—Mr. E. J. Wall in the chair.

COLOURED LANTERN SLIDES.

Mr. CHAPMAN JONES (Hon. Secretary) showed specimens of lantern slides on gelatine plates, toned with the sulphocyanide bath, the point aimed at in toning being to get two colours. Most of the slides had been so treated that the foreground was of a warm tone, while the sky was tinted blue, the result, as was suggested, of "double toning." They had been lent to Mr. Chapman Jones for exhibition at the meeting, but he could give no details as to the manipulation, except that there had been no local treatment.

A PHOTOGRAPHIC MUSEUM.

Mr. R. CHILD BAYLEY (Assistant Secretary) read a paper with this title, in which he called attention to the various articles of which the Society's collection was at present composed, and indicated some directions in which it was desirable that it should be augmented. First in point of date was a curious work called *Giphantia; or, A View of What has Passed, What is now Passing, and, during the present century, What will Pass in the World.* The book was a translation from the French, and was printed in London "for Robert Horsfield," in Ludgate-street, 1761," and contained the following prophetic passage: "Thou knowest that the rays of light, reflected from different bodies, make a picture and paint the bodies upon all polished surfaces, on the retina of the eye for instance, on water, on glass. The elementary spirits have studied to fix these transient images; they have composed a most subtle matter, very viscous, and proper to harden and dry, by the help of which a picture is made in the twinkle of an eye. They do over with this matter a piece of canvas, and hold it up before the objects they have a mind to paint. The first effect of the canvas is that of a mirror; there are seen upon it all the bodies, far and near, whose image the light can transmit. But, what the glass cannot do, the canvas, by means of the viscous matter, retains the images. The mirror shows the objects exactly, but keeps none; our canvases show them with the same exactness, and retain them all. This impression of the images is made the first instant they are received on the canvas, which is immediately carried away into some dark place; an hour after, the substance dries, and you have a picture so much the more valuable as it cannot be imitated by art nor damaged by time." The Society's collection included a small collection of Daguerreotype apparatus, formerly the property of Mr. J. Werge; several calotype negatives, and an unmounted print, by Fox Talbot copies of the *Pencil of Nature* and *Sun Pictures in Scotland;* large volumes containing eighty-two calotypes, most, if not all, by Talbot, and a series of portraits and figure studies by D. O. Hill and Robert Adamson; calotype prints taken during the Crimean War by Mr. Maynard, and silver prints taken in the Crimea during the war by Mr. Roger Fenton, the first Hon. Secretary of the Society. The sole example of Daguerreotype in the collection was a stereoscopic view of the 1851 Exhibition. Mr. Child Bayley also summarised the books, apparatus, and lenses in the possession of the Society, forming the nucleus of a photographic museum; however rapidly it might grow, it was hardly likely to outgrow the power of the Society to provide accommodation for it, while many things of great interest to students of photography were lost every year through being left in private hands. He knew of two recent cases in which the deaths of persons connected with the early history of photography had led to the disposal and practical loss of many objects. It could not be too widely known that the Society offered to the possessors of such articles accommodation for their safe keeping and display, where they were likely to be readily seen by those most interested, and, if, for any reason, they could not be given to the Society, they would be welcomed on loan.

Mr. T. BOLAS suggested that a list of articles required for the museum should be printed and circulated.

Mr. T. R. DALLMEYER endorsed the suggestion, and referred to the advisability of a report being drawn up by the Technical Judges at the Exhibition with regard to the apparatus exhibited. Such a report would be valued by the exhibitors, and would be an inducement to them to come forward, and would also, no doubt, lead to specimens of many of the novelties introduced finding their way to the museum. He also alluded to the suggestion recently made with regard to the holding of a Techuical Exhibition, and expressed a hope that it would be adopted and that a great deal more interest might be concentrated upon the technical aspect of photography.

Mr. BOLAS and others made some remarks upon this point, but the CHAIRMAN called attention to the fact that the discussion was not pertinent to the paper.

Mr. EDGAR CLIFTON advocated the collection of portraits of the pioneers of photography, and

Mr. CHAPMAN JONES said Mr. Hollyer had kindly undertaken to copy for the Society as many of such portraits as could be obtained, and was proceeding with the work.

Mr. W. THOMAS thought it would be well to include the museum in the Annual Exhibition together with the latest improvements; it would be very interesting to see how, and under what circumstances, the early photographers worked, and to compare their results with those attained in the present day; it would take the "bounce" out of a good many modern photographers.

Mr. W. E. DEBENHAM, Mr. DALLMEYER, and the CHAIRMAN also spoke, and promised to present various objects of interest to the Society, the last-mentioned referring favourably to the subject of the proposed Technical Exhibition.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 26,—Mr. R. Beckett in the chair.

Mr. F. Goddaer was elected a member.

Mr. P. Everitt exhibited a specimen of the Vergara film, developed before the Association some years ago by Mr. Wollaston, and which had been in his possession ever since.

The HON. SECRETARY read a communication from the late Recorder, Mr. G. W. Atkins, on the subject of the

DEVELOPMENT OF FILMS.

Having to make a stay in France, Mr Atkins, for the sake of something to do, bought an Eastman pocket Kodak, and took with him a quarter-plate dish, with some concentrated developer, and thought he was going ahead all right; but he found himself pulled up short on account of the extremely "rollable" proclivities of the film in the dish, which, with only the aid of one's natural number of fingers, was quite unmanageable. Being unable in Dieppe to obtain the special appliances for dealing with the films, in an inspired moment he thought of a test tube, and bought a couple and a rubber stopper. This was the whole outfit. He sent two sketches of the *modus operandi*, one showing the piece of film (three exposures) with its black-paper backing. If the former is pushed slightly in advance of the backing, and the two then inserted together in the test tube, slightly rolled at right angles to its original form, on the withdrawal of the paper the film remains behind in the tube. It only remains to pour in the developer, three-quarters of a fluid ounce being enough, and close the tube with the rubber stoper, rocking the solution from end to end. The development can be judged by transmitted light with great facility by holding up the tube between the eye and the lamp. The tubes were eight inches long by one inch in diameter, and Mr. Atkins advises that the diameter be no more than that given, as the film is liable to take up a spiral form, and collapse to its natural curl to the bottom of the tube. When development is complete, the tube is rinsed out with water, the film withdrawn, and inserted in the same position in the second tube containing the fixing solution. All these operations can be easily performed, and without any mess, and Mr. Atkins says these small films are more easily handled than a plate.

Mr. T. E. H. Bullen had a dodge for developing a long length of film very easily. By the aid of a deep quarter or half-plate dish, and a glass rod, over the ends of which a couple of elastic bands had been slipped, at the bottom, he was able to run the film round this from end to end, developing simultaneously the whole of the film in a minimum of space.

Mr. A. MACKIE mentioned a method for coping with great lengths of film, forty to seventy feet in length, by means of a tray fitted with a series of pegs, round which the film was wound. In this way transferring from bath to bath was greatly facilitated, the tray being simply taken from one to the other, and the film was not removed until it had been developed, fixed, washed, and dried.

Mr. EVERITT suggested the use of a roller and trough similar in effect to a stamp damper, but on a larger scale, the length of film being spirally wound on the roller. By turning a handle the film would be revolved in the trough containing the developer, and he pointed out that a good length of film of, say, one and a quarter inches in width, could be disposed of on a roller of twelve inches in diameter and about sixteen inches long.

Mr. MACKIE said this idea was abandoned in favour of the peg method. There were one or two advantages in the use of films—the possibility of printing from both sides, which was important, and their lightness, which was, however, but secondary.

CARBON PRINTING.

Mr. E. J. WALL described some peculiar markings on carbon tissue he had recently seen, and a discussion ensued on the working details of the process.

Mr. PAUL MARTIN said he used neutral bichromate solutions, varying in strength from one-quarter to four per cent., according to the effect aimed at. The temperature of his bath was 60°, and the immersion about three minutes, after which the tissue was transferred to a ferrotype plate and squeegeed down. The tissue was left on the plate, and dried in about two days, and was quite clean and free from fog.

Mr. MACKIE thought the value of varying strengths of solution was not so fully appreciated as the facts warranted. It would be found of great advantage.

Mr. EVERITT thought quick drying left the tissue in better condition. He contrived so that his tissue was dry in some hing like an hour and a half, and found no ill effect traceable to gas fumes. He had experienced difficulties in getting clean lights on sepia tissue until he reduced the percentage of bichromate in his bath, when he succeeded. The prints were previously so flat.

Mr. MARTIN said he found that the sepia tissue necessitated a weaker bath.

Mr. WALL, in reply to a remark by Mr. Everitt on the development of Artigue prints from the front, said it was on account of the extreme thinness of the vehicle containing the pigment on the tissue. There was far less vehicle than on a dry plate, and the true secret in its manufacture was to get a maximum of colouring matter with a minimum of the vehicle.

Mr. MACKIE added that the theory was that the gum holds the pigment more or less tenaciously, according to the degree of light action.

A discussion took place as to the preparation of the tissue, and Mr. WALL suggested the insertion of the gummed paper in a photogravure box, and dusting-on a suitable pigment by its means.

PHOTOGRAPHIC CLUB.

NOVEMBER 25,—Mr Frank Haes in the chair.

Major J. J. Thomas was proposed as a member.

Mr. Foxlee showed examples of work made by Mr. Witcomb, a photographer in Buenos Ayres.

Mr. H. L. N. NOEL-COX delivered his lecture entitled

POMPEII,

which was illustrated with a series of one hundred slides, mostly from his own negatives. The lecturer's descriptive matter was admirably lucid, and the slides of great excellence. Mr. Noel-Cox's contribution to the Club's series of Travellers' Nights was thoroughly appreciated by a considerable gathering of members and friends.

On December 16, Mr. Dallmeyer will give a paper entitled *A Chat about Lenses*.

Brixton and Clapham Camera Club.—November 17, Chairman Mr. W. Fraser (Vice-President). Mr. D. WALTER read a paper entitled

HOME-MADE APPARATUS AND HOW TO MAKE IT.

Accepting as undoubted facts that photography is an expensive hobby, and that much of this expense can be saved by knowing how to use a few tools and making one's own apparatus, he gave thorough instructions as to the making of cameras, dark slides, printing frames, shutters, and other articles, explaining mitreing, dovetailing, and other mysteries in woodworking, and showing many home-made tools and simple contrivances which greatly facilitate getting an accurate fit. As Mr. Walter's cameras and models were closely inspected and his paper aroused much interest, it is not improbable that attempts at camera construction will be made by some who were present, particularly as Mr. Walter promised his assistance to any one undertaking the task.

Croydon Microscopical and Natural History Club (Photographic Section).—The twenty-seventh annual *Soirée* of this Club was held on Wednesday evening, and was attended by some 520 of the members and their friends. In addition to the usual display of microscopes and numerous objects of natural history, &c., the Photographic Section was, as usual, well to the front, no less than ninety-two framed pictures and 363 lantern slides being shown. Space will not permit us to particularise all the pictures shown, but we may mention some very fine bromides by Mr. H. C. Collyer, illustrating some places of interest in the East. Mr. C. Moss sent six pictures illustrating his peculiar method, the colour and sky effects being very pleasing. Mr. E. Straker sent two frames of three pictures, each on gelatino-chloride paper. Mr. A. Roods (Hon. Librarian) showed some very good Welsh views, including two bromide enlargements of the Swallow Falls and Miner's Bridge. Mr. J. H. Baldock sent nine pictures, including some Welsh views and tree studies in gelatino-chloride, views in Kew Gardens on bromide paper, flower studies and views of the decorations at the Royal visit to Croydon in platinum, and a couple of bromide enlargements. Mr. East sent six pictures of rural and other scenes, and a very large bromide enlargement, representing a view of holiday life at the seaside. Mr. E. J. Platts showed some pretty views of places of interest taken in Surrey, some flower studies in platinum, and two bromide enlargements—one being of the Clayton Arms and pond on Godstone Green, and the other of a fine cedar-tree in Kew Gardens. Mr. C. H. B. Sparrow sent six pictures illustrative of the effects producible on Venus paper, the colours of which were much admired. Mr. J. Packham and Mr. S. H. Wratten showed some very pleasing portrait pictures, produced by processes peculiarly their own, the *modus operandi* not being stated, but the effect was somewhat similar to the carbon process. Mr. H. D. Gower (Hon. Secretary) showed a very good platinotype of a group of flowers, china, &c., painted by hand to represent the colours of the different objects, this being well done, and producing quite a novel and pleasing effect. Mr. J. T. Sandell showed eleven remarkably fine gelatino-chloride prints, 15×12, of his well-known series, taken for the City Companies. Other pictures were sent in by Messrs. Barber, Coldwells, Grundy, Hoole, Reeves, Page, Underhill, and Wild. Among the transparencies must be noticed a very fine set by Mr. Alfred Underhill, of Croydon, 8×5, representing a series of views taken on the occasion of the visit of T.R.H. the Prince and Princess of Wales to open the new municipal buildings. This gentleman also sent in eighty-eight lantern slides. Other slides were also sent in by Messrs. Baldock, Barber, East, Grundy, illustrating Alpine scenes; Hoole, views on the Norfolk Broads; Page, Platts, Roods, Sandell, and Wild. During the evening three exhibitions of selected slides from the above were given by the optical lantern, under the management of Messrs. Baldock and Underhill, to overflowing audiences. Messrs. W. Watson & Sons, of Holborn, gave a demonstration on a large scale of the Röntgen X rays, which, it is needless to say, was crowded the entire evening. Messrs. Thorne and Hoddle showed an acetylene generator and burner, together with the apparatus necessary to adapt this light, not only to ordinary illumination, but for microscopic and lantern work as well. A capital selection of music was discoursed by a local band, and at ten o'clock the Exhibition, which was in every way a success, was brought to a close.

Hackney Photographic Society.—November 24, Mr. R. Beckett presiding.—The report on the late Exhibition was given by the Hon. Secretary. It had been a success in every way, and thanks were given to those members who had specially helped to bring about the result. The discussion on Exhibition matters was postponed to the next Open Night. Members' work was shown by Messrs. Hudson and Carpenter.

Leytonstone Camera Club.—On the 18th inst., Mr. A. E. Bailey in the chair, Mr. G. E. Cox gave a lecture entitled

REMINISCENCES OF TRAVEL,

describing a recent tour to Morocco, the Canary Islands, and Madeira; the lecturer gave a graphic description of the many novel sights met with during his journey in these sunny climes, the first touched at being the renowned stronghold of Gibraltar, where a few hours were spent exploring the town and driving to Europa Point, from which coin of vantage a grand view over the Mediterranean is obtained; then across the Straits to Tangiers in the dominion of the Sultan of Morocco, where the first glimpse of Oriental life is obtained. This city is one of a most interesting character, the novel sights on every side being truly enchanting to the unaccustomed eye. The great mosque, the exterior only, however, to be looked upon by the "dog of a Christian," the Courts of Justice, the narrow eastern streets crowded with people in costumes of the most picturesque character combining to delight the visitor at every turn; but with all this charm of beauty and originality there is a great deal calculated to pain and disgust the senses of the fastidious English traveller who is accustomed to fairly clean streets, and the presence of some kind of sanitation, however imperfect it may be in some places; but in Tangiers, as in all Oriental towns, no one seems to think these matters are of any importance whatever, and the refuse of houses is thrown out into the streets, conducing to a result better imagined than described. Another point which strikes the visitor with feelings of sorrow and pain is the absolute cruelty of the people to their patient beasts, whose lives in Morocco must be constant torture. A visit was made to the prison where the unfortunate inmates are manacled and chained. The lecturer proceeded to describe at considerable length other Moorish towns on the coast, and the charming and grand scenery of the Canary Islands. The lecture, which was listened to throughout with sustained attention, was illustrated by a large number of lantern slides made from negatives obtained during the tour.

North Middlesex Photographic Society.—November 23, Mr. A. H. Lisett in the chair.—Mr. S. H. Schofield was elected a member of the Society. Mr. S. H. FRY gave his demonstration on the

HOME PREPARATION OF ROUGH BROMIDE PAPER.

He coated a sheet of Whatman's imitation Creswick paper with emulsion, first soaking the sheet in water and surface-drying it with a handful of cotton-wool, after laying it down in a glass-bottomed dish, with the edges turned up to form a dish of the paper itself, then pouring on the emulsion and allowing the surplus to run off at one of the corners. When set, it should be hung up to dry. He went very fully into the details of manipulation, and replied to the questions which the demonstration elicited. A hearty vote of thanks to the lecturer concluded the proceedings.

Polytechnic Photographic Society.—November 25.—Mr. T. E. FRESHWATER, F.R.M.S., F.R.P.S., read a paper on

PHOTO-MICROGRAPHY,

describing the necessary apparatus, fixing up, and exposure and working, also the best subjects for low-power work, finishing the lecture by showing lantern slides of all the objects upon which he had been speaking. The paper proved so interesting that the members, having heartily thanked Mr. Freshwater through the Chairman (Mr. Howard Farmer), asked him to be sure and favour them again at no distant date. On Wednesday, December 9, the Hon. Secretary will read a paper, with demonstration, on *Photography and Lantern Work* at 8.30 p.m.

Putney Photographic Society.—November 19, Mr. F. Chasemore in the chair.—Mr. H. W. BENNETT had kindly consented to read his Royal Photographic Society's lecture on

ARCHITECTURAL PHOTOGRAPHY,

and this attraction drew a large audience of members, who closely followed his most interesting and instructive paper. The paper is one that cannot fail to be of the greatest help to photographers who take up this branch of the subject, as it deals with it in a thoroughly practical way. The lecture was illustrated by some very beautiful slides of cathedral interiors, which were greatly admired. The next meeting takes place on Monday, December 7, when Mr. J. A. Hodges, F.R.P.S., will give a lecture on *Holiday Rambles with a Camera*.

Richmond Camera Club.—On the 23rd inst., Mr. Cembrano presided at a meeting at which Mr. J. T. SANDELL gave a highly interesting lecture on the subject of

MULTIPLE-COATED PLATES.

He explained the principle and structure of the well-known Sandell plates, claiming for them the three great advantages of latitude in exposure, fineness of gradation, and freedom from halation. The first point he illustrated by developing simultaneously in one dish four plates exposed on the same subject for one, four, sixteen, and sixty-four seconds respectively, all four yielding satisfactory negatives. The claim to delicacy of gradation and freedom from halation was convincingly upheld by the exhibition of a large number of photographs of subjects, and taken under conditions which were calculated to put those qualities to the severest possible test.

South London Photographic Society.—The Past Ordinary Meeting of this Society, held at Hanover Hall, Hanover-park, Peckham (Mr. W. F. Slater, Vice-President, in the chair), was devoted to a competition of prints and lantern slides from negatives taken at the Society's Excursions during 1896. Mr. F. W. Levett and Mr. Saville-Kent (Brixton Camera Club) officiated as Judges. Mr. George Brown was declared the winner of the silver medal offered for pictures. Mrs. Welford showed the best individual picture, *Marguerites*. In the lantern-slide competition, the Hon. Secretary was declared the winner of the bronze medal for the best set. Mrs. Welford and Mr. Sinclair were equal for the second place, Mr. Allen, the Excursion Secretary, was close behind them. At the next meeting, on Monday, December 7, the President will deliver a lecture on *Isochromatic Photography*.

Woolwich Photographic Society.—November 25, Mr. J. B. Panting in the chair.—The third of a series of lectures on *Art Photography*, by Rev. F. C. Lambert, M.A. The subjects treated on this occasion were: (1) Treatment of Figures and Groups, (2) Laws of Grouping, (3) Sentiment in Landscape Art. After the lecture several slides by the members were passed through the lantern for criticism by the lecturer.

Ashton-under-Lyne Photographic Society.—November 24.—Mr. Thomas Glazebrook is to be heartily congratulated on the success of his lecture and exhibition of photographic views on Tuesday evening. He makes no pretence to polished diction or neatly turned phrases, but he feels strongly and talks vigorously, and strikes the nail on the head with a forcible, unerring blow. He is an ardent lover of all that is beautiful in nature, and nobody can listen to him long without being fired with some portion of his enthusiasm. This is one of the greatest benefits conferred by photography. The devotee soon finds that he must go out into the country and study nature with the eye and inspiration of a poet if he has to make any great progress in his art. To reproduce with effect the beauties he beholds around him, he must become a master of his art and a keen observer of every process which contributes to the result. Mr. Glazebrook's series of slides, of remarkable variety and interest, kept the large audience entranced and delighted. The catholicity of subjects was one good feature. He is quite Shakespearean in the universality of his tastes. Nothing comes amiss. He revels among the delicate orchids of a gentleman's greenhouse at one time, and anon we find him at the farmer's pigstye, wondering at the gross animals there to be found. Then he is poking his camera among the hedgerows to secure a little bunch of wild flowers, and then a giant oak or spreading cedar takes his fancy. He follows the schoolboys to a pond, where they exercise the gentle piscatorial art at the expense of a few jacksharps, and sees them frolicking "like trontlets in a pool" in a state of artistic nudity. He revels among the mountains and the lochs, and "in darkness and in storm he takes delight." He is equally pleased with domestic pets, with the sheep of the hillsides and the cattle of the meadows. The birds of the air enchant him with their music, and no schoolboy was ever so fond of bird-nesting, not, however, to rob the eggs, but to photograph them. In short, there seems to be no department of the art into which he has not sought to penetrate, and the results, as seen on Tuesday evening, were very pleasing and instructive.

Bournemouth Photographic Society.—November 13.—Dr. Hyla Greves gave an address on the science and art of photography. He prefaced his remarks on this subject by welcoming those assembled, and pointing those who were not yet members to the profitable and entertaining character of the Society's gatherings. He likewise took occasion to refer to the zeal and enterprise manifested by the Secretary, Mr. Greenleaves, in the interests of the Society. In the course of the evening there was some excellent vocal and instrumental music. Mr. Pardy presided at the pianoforte, and songs were given by Messrs. Twitchett, Gardner, Butler, and Britton. The photographs sent in for competition No. 2 were exhibited, and the awards made known as follows:—1st prize, 1*l.* 1*s.*, Miss Skirrow; 2nd, 10*s.* 6*d.*, Mr. R. W. Copeman; 3rd, 5*s.*, Mr. T. Lee Lloyd. The first of these had been sent in under the pseudonym "Hyacintha," and represented the Pillar under the Temple Platform, Jerusalem; the second, labelled "Kybosh," was a picture of the reredos, Christchurch Priory; and the third, labelled "The Baron," gave Salisbury Cathedral. A display of members' lantern slides took place, the lantern being operated by Mr. W. Jones.

Cardiff Photographic Society.—The Society opened the winter session at their rooms, in Working-street, on the 20th inst., with an interesting Social Evening. Most of the "powers" in local art circles were present, and a very varied programme was provided. The President and Mrs. S. W. Allen gave a pleasing contribution, which was much appreciated, and the musical items were most ably contributed by Miss Nicholas, and Messrs. Stephenson, Pratt, and Wordsworth. A number of excellent prize slides were passed through the Allendale lantern, and only wanted perhaps a little more descriptive matter thrown in. One of the most interesting shows of the evening was the exhibition of the Vitograph, by Professor Kloss. In this form of apparatus the living pictures are projected by means of an attachment to the ordinary lantern, which certainly seems very portable and devoid of unnecessary mechanical complications. A good word must be said for those who have been responsible for the exceedingly attractive appearance of the rooms, and to whose efforts the entertainment was due. There are probably few societies which can boast of more artistic premises than those now occupied by the Cardiff Society.

Mr. J. J. Jenkins gave an interesting paper on

Alpha Lantern Plates,

illustrating his remarks with a large selection of slides. The great range of colours to be obtained from these plates, and the advantages they offered when the production of slides from poor negatives was required, showed them to be well worth the attention of amateurs whose stock of first-class negatives might not be of the largest. Mr. Jenkins pointed out that the use of a small quantity of metol in the hydroquinone developer of the maker's formula greatly reduced the time required for development which was otherwise rather a slow process, and also gave rather a better colour to the slide than that secured by hydroquinone alone. The annual meeting of the Society takes place on the 4th inst.

Liverpool Amateur Photographic Association.—November 26, the President (Mr. J. Sirett Brown) presiding.—Dr. C. Thurstan Holland gave a demonstration on the X rays. He explained the great strides that had already been made since Professor Röntgen discovered the new light, particularly as regards the length of exposure necessary to obtain a satisfactory result. He felt sure that it was only a question of time before an improved tube would be invented giving a larger quantity of rays, and so still further reducing the time of exposure, possibly making it instantaneous. Dr. Holland then "radiographed" the hand of one of the lady members, and afterwards exhibited in the lantern a number of examples taken by himself, including photographs of hands from that of an infant to that of an adult, showing the formation and growth of the bones, which he endeavoured to prove were not always uniform in children of the same age; also of coins which had been swallowed, and foreign substances imbedded in the flesh and bone; deformities, and perfectly and imperfectly set joints. He also showed how the rays could distinguish diamonds and paste.

Oxford Camera Club.—November 23.—Lecture on *Intensification and Reduction*, illustrated by lantern slides showing the effects produced by various processes. In the discussion of the paper surprise was generally expressed at the omission of the uranium process of intensification, many members having found that method much more satisfactory than any of the others. Notice was given that, at the next meeting, on December 14, a number of Captain Abney's slides of Swiss scenery would be shown, and members were asked to make the fact widely known.

Wakefield Photographic Society.—November 27.—Mr. H. M. Briggs read a paper on

Exposures,

giving his experiences in England and in Norway, and illustrating his remarks with diagrams, negatives, and prints. Mr. Stansfield, in moving a vote of thanks to Mr. Briggs, dealt with several points of the lecture, especially with regard to the strength of light on bright and cloudy days. The Rev. C. J. Jones seconded, and, as a beginner in photography, much appreciated the paper and examples. Mr. Miles preferred a Wynne's meter to any other, as there was no guesswork, but an actual test of the light at the time. His method of counting is to hum the tune of "Yankee Doodle," there being four notes in each bar, and each bar represented a second. Sample boxes of Edwards's lantern plates were distributed.

Wolverhampton Photographic Society.—November 20.—Mr. J. Gale gave a demonstration of the

Bromide, Sylvio, and Negative Papers

of Messrs. Wellington & Ward. Mr. Gale had exposed several pieces of the bromide paper behind negatives for five seconds at a distance of eighteen inches from a gas burner, and proceeded to develop them before the members. He first soaked them in plain water, turning them over and over, to avoid air bubbles, and then immersed them in a developer of metol and glycin, with very satisfactory results, one piece of tinted paper having been used to copy an old engraving, for which it appeared to be admirably suited. Mr. H. Holcroft, who had tried the negative paper, spoke in favourable terms of its utility. In all respects the paper is treated as glass plates are, and, after development, the gelatine film may be kept upon the paper support or stripped off. Mr. Holcroft showed several paper negatives, and prints obtained from them, with and without stripping the film from the paper, the prints obtained from the unstripped negative being equally good, but required a little longer exposure, and showed no granularity; and the stripped films appeared to be everything that could be desired, being easy to strip, very flat, and exceedingly tough, and bearing any amount of rough usage in the operations without damage. Mr. Holcroft intimated his intention of discarding rollable films in favour of paper negatives. A number of specimen prints, which had been kindly forwarded by the manufacturers at the request of the Society, were handed round, and were much admired, and were allowed to remain the property of the Society. The meeting terminated with a cordial vote of thanks to Messrs. Gale and Holcroft for the trouble they had taken in the demonstration.

1896. FORTHCOMING EXHIBITIONS.

December 4.....	Aintree Photographic Society. E. P. Heron, 2 Tilney-street, Orrell Park, Aintree, Liverpool.
,, 29–Jan. 2.	Borough Polytechnic Photographic Society. P. C. Cornford, 103, Borough-road, S.E.
Dec. 1896–Jan. 1897	Bristol International. Hon. Secretary, 20, Berkeley-square. Clifton, Bristol.
1897.	
January 14, 15	Weymouth and District Camera Club. E. C. Bennett, 10, Newberry-terrace, Weymouth.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

AMMONIA IN THE MANUFACTURE OF EMULSION.

To the Editors.

Gentlemen,—I note in your issue of the 20th a letter from Mr. York, in which he says that at an early date, I told him I was experimenting with ammonia in emulsion-making, &c. I cannot give the exact date of my first suggesting ammonia, but it came about in this way. Mr. J. Thompson was experimenting with gelatino-bromide emulsion. He gave

it as an opinion that certain failures arose from the action of the nitrate of silver on the gelatine. I immediately suggested double decomposition, so that another compound of silver should be employed (*i.e.* ammonia nitrate); this occurred at a date before I had any practical experience, and my later results, which were published, are well within the recollection of the early workers. When I suggested the ammonia, I had on my mind that all ammoniacal preparations were more sensitive. This recalls to my mind an episode that took place at one of the Photographic Club meetings. I made a statement that I was in the habit of mixing an ammonia-nitrate solution of silver with a plain solution without causing a precipitate. I was anything but politely informed "that it was an impossibility," and one of the members went so far as to say "he would not believe it if he saw it." Suffice it to say, that this member related at the next Club meeting, that I had called upon him, and made him do the so-called "chemical ledgerdemain trick. I had no idea that any three or four F. C. S.'s could be so ignorant in this matter. A few years ago I stated that "pits" in plates *did not* arise from grease in gelatine, and for a time I had emulsion-makers sending me batches of emulsion; to treat this was a very easy matter, I had only to melt it up and add a few grains of carbonate of ammonia. Subsequent to this, when I was at Monte Carlo, I was using French plates which had "pits" badly. I wrote to the maker, giving him the cure; he replied "that he would try, and if successful he would present me with some plates." He sent the plates and a letter to the effect "that the ammonia increased the rapidity and cured the pits."

In some respects it is a *pity* that there are such good uniform plates in the market, it prevents many from experimenting. It has been stated that ammonia-made plates do not keep well; that is not my experience. I have lately tested some I made in 1887, and, although they were very loosely packed, they were perfect in every way. Any emulsion made by the ammonia process is more rapid in the camera than a boiled one, *i.e.*, an ammonia emulsion giving fifteen per cent. Warnerke will be more sensitive than a boiled one, giving eighteen Warnerke (in the camera). One curious fact is that, the more carbonate of ammonia that is employed in converting the silver, the greater is the speed of the plate in the camera. I am quite well aware that an ammonia-made plate is more prone to give green fog when developed with pyro and ammonia; but, now that ammonia and pyro is seldom used, I can see no reason why all emulsions should not be made by the ammonia method. By the bye it may not be generally known that a small quantity of meta-gelatine added to the finished emulsion will soften the film and give a much finer and more rapid result.

In conclusion, I may mention that Dr. Monkhoven experimented at an early date with ammonia. Apologising for taking up so much of your valuable space,—I am, yours, &c. A. L. Henderson.

Hotel Finstermünz, Meran, Austria, November 23, 1896.

SCIENTIFIC INSTRUCTION AND THE PHOTOGRAPHIC PROFESSION.

To the Editors.

Gentlemen,—May I be permitted to say a few words in reply to Mr. Randall's letter in last week's Journal?

Although I do not pretend to have any technical or practical knowledge of the "rules and mysteries" of photography, it has always seemed to me a needful requirement, for those practising the art, that they should be well grounded in the scientific parts thereof.

On perusing the pages of your Journal, one cannot avoid wondering, and asking "how many of the professional photographers of this country understand the contents of your valuable weekly compilation?" For aught I know, *all* the 3000 professional photographers are well versed in the kindred sciences which have so much to do with the successful practice of the business—chemistry, optics, mechanical construction. No one can dispute that, if they possessed such knowledge as applied to their calling, they would, of necessity, produce more skilful results.

At the Edinburgh Convention I had the privilege of speaking upon the absolute necessity of such knowledge for the rising generation in the ranks of the professional photographer; not only for the daily duties of producing "portraits," but that the knowledge might be applied in all the various branches of the trade in photographic representations of articles of manufacture; of work for book illustrations, magazine, and newspaper work.

I am convinced that there is a wide field for active energy in the branches thus named, and which would bring profitable results to local and provincial, as well as to the metropolitan profession. I have taken a considerable part, for some forty years, in many of the works for Birmingham progress, and the development of its educational institutions.

Foreign competition has touched us nearly in this city, and the recent establishment of a Municipal Technical School has been the contribution of the citizens to supply the scientific teaching so needful to our youth, and all branches of trade and manufacture. We can now boast of a magnificent building erected at an outlay of 100,000*l.*, opened by the Lord President of the Council (the Duke of Devonshire). We are largely indebted to the continuous and indefatigable exertions of Councellor R. F. Martineau for piloting this noble institution to its present admirable condition.

The tenour of Mr. Randall's letter is not to give knowledge broadcast to our youth, but to restrict it, in fact, and, in the mean time, to go about, like the philosopher of old, with a lantern, seeking for a young man of genius. Mr. Randall completely perverts the intention of Huxley in the quotation made in his letter. Huxley, like all great thinkers of the time and all real educational experts, advocated the greatest possible spread of education, scientific and otherwise, whereby the "man of genius" can *discover himself*, and rise necessarily to the foremost place, which he merits by natural gifts and facilities afforded him for their practice and development. It is this practice and opportunity, afforded so widely to our German and French competitors, which gives them, in so many branches of science and trade, an immense advantage over the British youth.

However, we have entered upon the work of altering these defects and of supplying these deficiences, and not a day too soon for the interests, moral and material, of our people at large. There are many other considerations of this important question, suggested by Mr. Randall's letter, but I will not encroach further on your space.—I am, yours, &c.,

47, *Charlotte-road, Birmingham.* D. J. O'Neill,
Secretary, National Association of Professional Photographers.

THE PHOTOGRAPHIC SALON.

To the Editors.

Gentlemen,—When some few weeks ago a letter appeared in your columns making certain misstatements concerning the management of the Photographic Salon, I took the liberty of pointing out to you these inaccuracies, and from the nature of the circumstances I felt justified in referring to them as "fabrications." Now, it appears from another letter in yours of last week that this correspondent, having said what is inaccurate, complains of his being told of it.

If a person hazards a misstatement concerning an institution, or misrepresents it, he can hardly be surprised if some one, in attempting to set him right, waives for the time being such courtesy as is customary.

I cannot but regret, for your own sakes and for your readers, that your correspondent should last week have taken advantage of your desire to act fairly by all parties, and imposed upon you nearly two columns of matter dealing with the manner in which the Exhibitions are reviewed in the paper I have the honour to edit, and quoting what I at various times have said respecting them, all of which would seem to me so utterly unnecessary because other people read the *Amateur Photographer* besides your correspondent, and so can read *all* the text instead of disjointed, and therefore misleading, phrases.

My only object, in writing now, and asking you to publish this letter, is not to discuss, but to state some facts concerning the Exhibition of the Photographic Salon, because, doubtless, your paper reaches the hands of many whom last week's letter might mislead.

Firstly. The Salon prospectus and entry form is for all practical purposes identical with that of any other Exhibition, special mention, however, being made of the fact that all works will be submitted to a Selection Committee, and the particular kind of work desired is stated.

Secondly. Every picture sent in, whether by a member of the Linked Ring or by any one else, is judged on an *absolutely equal basis.*

Thirdly. No member of the Selection Committee is present whilst his own works are being judged, *nor has he any vote or voice respecting their acceptance.*

Fourthly, and by the way. The Linked Ring, so far as I am aware, is not a "magic" circle as your correspondent calls it!

Finally. Your correspondent's statement that "at the latter (*i.e.*, the Salon), members' works are accepted because of their membership" *is absolutely and entirely untrue.*

Now, Gentlemen, your correspondent may go on writing about me or may air his opinions or display his ignorance respecting the Salon and its Committee just as long as you think it desirable to print what he writes, and no one will be one little bit the worse, but do you not think we have had enough of it?—I am, yours, &c., A. Horsley Hinton.

Guildford, November 30, 1896.

PATENT-LAW REFORM.

To the Editors.

Gentlemen,—I am obliged to you for your commendatory remarks upon my address to the Society of Patent Agents; but, as it appears that my statement upon the subject of a Patent Court was not sufficiently explicit, permit me to correct a misconception which otherwise might cause unnecessary opposition to the proposed change.

The original suggestion was to try all Patent cases before a Judge, chosen for his knowledge of technical affairs, in a special division of the High Court. To this proposal in itself no objection can be raised, as it is obvious that, the more familiar the Judge is with the matter in dispute, the greater the probability of justice being done; but I pointed out that no one man can be thoroughly conversant with the technical principles involved in the various branches of industrial operations, and that the Judge must, therefore, rely upon expert evidence, the correctness of which he could not check. In addition, there was the danger of experts becoming advocates in giving evidence, and, with technically trained counsel, specially coached for the occasion, the system is most expensive and may lead to injustice.

My proposal was *not* to take the case out of the High Court, which would be an impracticable measure,* but, in cases of infringement and revocation, to empower the Comptroller-General to receive all expert evidence in the form of Statutory Declarations, under regulations, and to submit the points of law and evidence to the Judge for his guidance. This suggestion refers only to expert evidence taken, as it were, by commission under the trained staff of the Patent Office, and is not intended to affect the conduct of the case by solicitors and counsel in any way. Consequently, ordinary witnesses as to prior user, or other such matters, could be examined and cross-examined under the eyes of the Judge at the High Court, while the experts were directly opposing their written opinions at the Patent Office. This would expedite the case, reduce the cost, and employ all parties concerned in the work for which they are respectively best fitted.

Your regret at my omission to refer to the superior systems of the United States and Germany, in examination for novelty, would impel me to supply the deficiency now, were it not that I should be compelled to differ from you; and I have already taken up too much valuable space.—I am, yours, &c., J. SINCLAIR FAIRFAX.

433, *Strand, London, W.C., November* 24, 1896.

A CORRECTION.

To the EDITORS.

GENTLEMEN,—Will you allow us to correct a slight error in your report of the meeting of the Croydon Camera Club of the 28th ult.?

We wish to state that the apparatus referred to by the President under the name of Grand Kinematograph was invented and perfected by my son, Mr. Gilbert Harrison, and myself; but the sole right to use and sell the same has been acquired by Messrs. Bender & Co., of Croydon.

Relying on your sense of justice for insertion of this, and thanking you in anticipation,—We are, etc., yours, T. J. & G. H. HARRISON.

Bowes Park, N., November 24, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street. Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Rev. J. H. Stanning, The Vicarage, Leigh, Lancashire.—*Series of four photographs interior of Leigh Parish Church, Leigh, Lancashire.*

RECEIVED.—H. S. C.; FADED PHOTOS; AND OTHERS. In our next.

J. BALLANTYNE.—We have forwarded your letter.

BOSCAWENT & CO.—H. GASCON, and others. See under Ex Cathedrâ.

S. H. ROBINSON (Charleville).—The ALMANAC is published at the beginning of each December.

E. B.—We have no practical experience of the camera. Better address your query to Mr. Friese Greeu, 39, King's-road, Chelsea.

BURNISHERS.—CAPTAIN X. Both forms are good. It is very much a matter of individual opinion as to which is really the better of the two.

H. L. MOREL.—We do not think you are either responsible or liable for the accident. If the lady threatens you, consult a respectable solicitor.

R. H. U. E.—We should call the colour of the mounts grey; but, as you are dissatisfied with the particular tint, the moral is, in future, only order by sample.

CHRISTMAS MOUNTS.—H. C. Surely you cannot be a reader of the JOURNAL, or you would see from the advertisement pages where Christmas and New-year's mounts are to be had.

STAINED NEGATIVE.—W. BOWER. The stains are due to the negative not being perfectly washed between the operations in intensifying, all the hyposulphites not being washed out before the bleaching operation.

F. W. BRITTAIN.—1. Yes. The process is well within the capabilities of a clever amateur. 2. Yes. 3. *The Half-tone Process*, by Julius Verfasser. It is published by Percy Lund & Co., Amen-corner, E.C., price 3*s.* 6*d.*

BURNISHING.—T. Wilson. The longitudinal lines on the prints enclosed are clearly due to scratches on the bar of the burnisher. The remedy is to work out the scratches on an oil stone or similar means. Grit would make the reverse kind of line.

CHRISTMAS CARDS.—W. HICKS. The print sent is a collotype. The reason why they are done so cheaply is that several negatives are printed on the same plate—indeed, as many as it will hold. Then the plate is printed from on a collotype machine. The prints are then severed and mounted as the one sent.

INSURANCE AGAINST FIRE.—DOUBTFUL (W. C.) There are at present some discrepancies between the ideas of the different fire offices as to the risks with acetylene. Therefore we should recommend you to communicate with the office in which you are insured before installing the light for night portraiture.

* The Incorporated Law Society would strongly oppose it.

INCANDESCENT GASLIGHT FOR PORTRAITURE.—INCANDESCENT says: "I wish to try incandescent gaslight for portraiture. Will you oblige and give me the address of the Company that advertised in your paper some time ago having fitted up a trial studio somewhere in Oxford-street?"—In reply: The address is, O. Sichel & Co., 47, Oxford-street, W.

FALSE PLATINOTYPES.—W. W. C. We fear the case you quote is but too common, yet it is a fraud all the same. Any one can, of course, recover the money back, through the County Court, if it was paid for platinotypes and bromides were supplied. The photographer would only be too glad to pay the money into Court to avoid the exposure.

VARNISH FOR CAMERA BELLOWS.—T. ROGERS says: "Will you kindly give a recipe for varnish to coat bellows of camera (leather) in small quantity?"—In reply: As only a small quantity of the varnish is required, it will be more economical to buy it than to make it, which is not easy on a small scale. It may be had from any of the dealers in bookbinders' materials.

REMOVAL OF GREASE.—B. TYLER asks: "Can you help me as to how to get off some tallow-candle grease from a piano, walnut frame, which I use as an accessory in my studio? A candle was upset on it the other night. I am afraid to try anything, in case of hurting the polish."—If the wood is French polished the grease can be wiped off with a clean rag; if unpolished, possibly a little benzole on the rag will be necessary.

GELATINO-CHLORIDE PRINTS.—VERDES, to make prints (gelatino-chloride) readily come off plate glass after squeegeeing and backing, has lately not put them through the alum bath until they have been fixed and washed for ninety minutes, then twenty to thirty minutes' final wash. Is he doing right, or will the prints fade?—In reply: If in the ninety minutes the whole of the hypo salts are completely removed, the stability of the print will not be impaired by the treatment.

MOTOR-CAR INCIDENT.—(W. A.) We do not know of any illustrated paper that would be likely to buy the copyright of the photograph of the "Amusing motor-car incident on the way to Brighton;" indeed, we should say none would, however interesting, because the matter is too stale now. Such pictures are only of passing interest, and are of no value when even a few days old. Had you sent the picture to one or other of the "illustrateds" the day of the procession, they would doubtless have utilised it, and paid for it—promptitude is everything in such matters.

COPYING OIL PAINTING.—J. P. RIDDLE asks: "Would you kindly tell me what it is that is used for coating oil paintings that are to be copied, so that a matt surface is obtained, and which does away with the reflection and markings of the surface?"—Various things have from time to time been recommended. Wiping the surface of the picture over with stout will degrade the gloss. Practical copyists, who make a speciality of this class of work, use nothing at all. They rely upon the illumination of the picture to avoid reflections. No owner of a valuable painting would, of course, allow it to be tampered with by coating it with any foreign substance.

OBSTRUCTED LIGHT.—INJURED. As your studio has only been erected a few years, you cannot make your neighbour take down his building, although it obstructs your light and causes a "red reflection" in the studio. Try and get his sanction to whitewash the offending wall. Then you will get a reflected light that, with judgment, you can utilise to great advantage. That is the best way, in your case, to deal with a "bad job." We should certainly advise you not to spend any money on law, for, to use a familiar phrase, "you have not a leg to stand upon." If the studio had existed twenty years, you could claim "ancient lights;" then the case would be different.

AGREEMENT FOR SERVICES.—R. A. C. says: "I have applied for an appointment in the West End of London, but I am asked to sign an agreement not to enter the service of any other photographer, or carry on business for myself, within three miles of the place under a penalty of 250*l.* That would practically preclude me following photography at all in London. Could such an agreement be enforced if I signed it?"—We should say not, as it would come under the "unwritten law" of restriction of trade. The case might be different in a small country town. Any how, we should say that such an agreement should not be signed, whether it could be enforced or not.

OPTICAL LANTERN FOR ENLARGING.—H. DODD writes: "I have just gone in for a ——'s lantern, fitted with limelight, and it seems all right for slides on the screen. The other night I tried to make an enlargement with it on ——'s bromide paper, but failed entirely to get a sharp picture. The negative was perfectly sharp, and a slide from it projected on an eight-foot screen was also as sharp as could be wished; yet, although the enlargement desired was only 18×15, and was as sharp as could be when focussed, it was woefully unsharp in the enlargement. Four attempts were made, but all with the same result. But why?"—The explanation is easy. The objective of the lantern is not corrected for the chemical rays, nor should it be, for the best result, as a lantern objective. When the lantern is used for photographic purposes, substitute for the lens with which it is fitted a photographic lens.

FLASHLIGHT COMPOUNDS.—J. WALTON says: "Can you give me any information as to the safety or otherwise of explosive flashlights, and how far insurance policies cover their use? A serious accident is reported from America by the explosion of a flashlight mixture, the operator having his left hand blown off. I have heard that all explosive powders are not exploded by friction. There is no doubt that an explosive powder acts best for portraiture, but if the powder contains any chemical that can be exploded by friction, I think it should be so stated by the makers."—In reply: The use of all explosive flashlight compounds is attended with danger, and, therefore, for safety sake, should be avoided. If they are used at all, they should only be mixed, with care, in small quantities as required for use. In the case of accident, we expect the insurance company would repudiate any claim. But with regard to that, you had better communicate with the office in which you are insured.

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EX CATHEDRÂ.

The suggestion that the Royal Photographic Society should hold a technical exhibition was discussed at the meeting of the Society, on November 24, and was favourably received by the members present. The photographic press is practically unanimous in recommending the Society to adopt the suggestion. Our own views with regard to the reasons that make the holding of such an exhibition desirable were fully set forth a few weeks ago, and do not need recapitulation, the more especially as there appears to us now to exist a strong general endorsement of our contention that technical photography has, in a great measure, been neglected by the Society of recent years, and that the holding of an exhibition devoted to illustrating the present position of the several branches of applied photography was urgently called for. We trust that the Council of the Society will take the matter into early consideration.

* * *

On the same occasion attention was drawn to the fact that the Society possessed the nucleus of a museum of photographic apparatus, examples of early processes, rare books, and other objects of interest to the student of progressive photography; and the hope was expressed that those in possession of such objects as were of historical or intrinsic interest in connexion with photography would select the Society as permanent custodians of them. We can bear testimony to the fact that the contents of the Society's museum are not permitted to grow dusty with neglect, and we are certain that, should any of our readers be disposed to make additions to the collection, they can do so with the feeling that opportunities will arise when the inspection and examination of such relics of bygone photographic times will give pleasure and profit to the members of the Society and others. Some further remarks on this subject will be found in our Leaderettes this week.

* * *

We learn that some of the fire insurance offices are modifying their ideas with regard to the "dangerous" nature of generated acetylene as an illuminant. In addition to the Westminster Office, which does not take an exaggerated view of the "risks" involved, we are told that the Royal and the Phœnix are not hesitating to grant policies on premises where acetylene is consumed, and it is also likely that other offices will adopt the same sensible course. The articles that we lately printed on this subject have been called alarmist by some of our friends, but we have so much faith in the future of the acetylene light that we considered it not imprudent to assist, thus early, in removing whatever obstacles stood in the way of its adoption. The English offices have been misled with regard to the "dangerous" nature of acetylene, but there is every sign that before long they will take up the common-sense attitude which the New York offices adopted many months ago, viz., that acetylene compressed in cylinders *may* be dangerous, but that the use of generated acetylene does not, *per se*, involve any more danger than the burning of house gas.

* * *

By the courtesy of Mr. Martin, photographer, of Wanganui, New Zealand, we give in another part of the Journal a copy of the Act which the New Zealand Legislature recently passed for the protection of photographs other than group or portrait photographs or those taken for a consideration. The substance of the enactment is, that by the simple inscription of the word "protected," with the date and the producer's name on the negative, the photograph has all the protection of the copyright law for a period of five years. Registration is apparently unnecessary. The simplicity of the means whereby even the

humblest amateur may, in New Zealand, protect his work against piracy will, we do not doubt, excite feelings of envy in the breasts of many of our readers, who look forward to the time when an amended Copyright Act, freed of ambiguities and absurdities, will be passed by Parliament.

* * *

Mr. J. B. Johnston, of Edinburgh, writes us: "Of all the curious places for photographing a group in, perhaps the top of a chimney 250 feet in height is as uncommon as any. In such a place, however, Mr. Moffat, of Edinburgh, photographed a number of gentlemen the other day. The occasion was the laying of the last brick (by the Lord Provost) to a new chimney for the gasworks at Edinburgh."

* * *

At the Camera Club, Charing Cross-road, W.C., there will be on view, from December 12, 1896, till February 2, 1897, an exhibition of photographs by Mr. J. Craig Annan, of Glasgow. The pictures include portraiture, landscape, and *genre*.

PROCESS PLATES AND THEIR USE.

To the few remaining users of the old wet-collodion process—a continually decreasing band—any kind of dry plate whatever is *anathema maranatha*. Yet that there is a demand, and an increasing demand, for process plates is shown by the greater prominence given to them by those makers who have added to their list of brands plates for use in process work. It is perhaps, in view of a desire to increase the sale of this particular class of plate, a little unfortunate that a different name had not been given to them, for the number of those photographers whose business is concerned in the manufacture of various kinds of metallic surfaces prepared by photographic agency for printing purposes must be very limited in comparison with those whose dry-plate consumption is mainly concerned with portrait and landscape work. We hope to show, however, that the field for the use of the specially prepared films we are discussing is by no means so restricted as the title given to them would suggest.

Throughout the various photographic establishments in the kingdom there is a quantity of work of no mean extent where, among those who were once familiar with but have now discarded wet collodion, many a regret is uttered that its merits and beautles are no longer practicable. Such workers should try process plates.

There is perhaps not a studio in the kingdom where there are not brought within a twelvemonth a large number of objects to be copied—photographs, old and faded, and sundry odd articles, ornaments, manufacturers' samples, old prints, manuscripts, and hundreds of other unconsidered trifles—for which the photographer would prefer to use wet collodion if everything were in order, but, as the necessary materials are no longer practically available, has to use ordinary dry plates. He is ignorant of the possible real usefulness of process plates, and is content to put up with the flat and grey results he is unable to get away from.

This avoidance of their use, is, in all probability, due to a misconception. Most photographers are aware that for such subjects as manuscripts, maps, plans, and pure line work generally, an almost opaque hard "black-and-white" negative, with perfectly clear glass, is desirable when a printing block, such as a photo-zincograph, is to be made from it. A kind of mental transference takes place, and it is thought that similar negatives are needed for half-tone process blocks, when the real truth is that the block-maker who makes the blocks that we see used in all the illustrated papers wants, it is true, utter absence of fog, but, at the same time, he certainly does not want black-and-white negatives.

If any one will purchase, for experimental purposes, a packet of these plates, he will find he can get portrait negatives of splendid printing qualities—plucky and full of half-tone. He will also discover that they are very slow—though not so slow as wet collodion—and that is their chief drawback. Their peculiarity, if worked as recommended, which is usually without ammonia in the developer, is that beautifully soft negatives may be obtained concurrently with any amount of density. The points in which they mainly differ from ordinary plates is their slowness, and their power of giving almost any density wished for. Let any one copy a faded albumenised print with an ordinary plate; it is most difficult to get a negative that will give a print devoid of a certain well-known flatness of effect; but with a process plate it is quite easy to get a negative with all gradations of shade that will give as good a print as if the most experienced wet-plate worker had taken it.

Very often an architect's plan has to be photographed on a reduced scale. To one not thoroughly at home with the work it is no easy matter to produce a negative that will give black lines in a pure white ground, even if the negative be intensified with mercury. If a process plate be used, such a negative will be obtained without any trouble with a very wide latitude of exposure.

Let us take the case of an old faded MS., the writing scarcely visible on the yellow paper, and ask what are the capabilities of the ordinary dry plate for securing even a fair printing negative? With a process plate it is possible to get a negative, not perhaps dense enough, but infinitely more so than even an isochromatic plate will give. If, then, a transparency by contact be obtained from this by a process plate, and in turn used for making a second negative, one that will give a brilliant print is easily produced, the chief point to note in this kind of work being to arrest the development before the blacks get clouded. We recently saw an excellent negative of a MS., which gave quite clear, pure whites that had been reproduced this way on account of stain in the original negative. Without any intensification, the portion of the film representing the white paper had been brought to such a depth of blackness that, though the stain was, no doubt, discernible, the writing printed out black before the stain had a chance to print. Again, in enlarging from a transparency in the camera, some workers find some difficulty in getting a plucky negative, such as they would easily have obtained years ago. If those who experience such difficulties will but change their ordinary for a process plate, all their troubles will shrink.

These few detailed examples give only a tithe of the cases where such plates may be used with ease and advantage, but they are sufficient for the purpose, and we may conclude by again repeating that process plates are slow, but are capable of giving a combination of softness with density that can only be likened to wet-plate effects, to which, moreover, are superior by reason of the readiness with which density may be obtained.

A Proposed Photographic Museum.—The paper read at the meeting, on November 24, of the Royal Photographic Society, by Mr. R. Child Bayley, once more raises the question of the formation.

of an Historical Photographic Museum. It is really a matter for surprise that the leading Photographic Society of Great Britain has, for so long, allowed the matter to be in abeyance. "In abeyance,' we say, because the Society did, some years ago, get together a pretty complete collection of historical subjects in connexion with photography. There is no question that a museum of early photography and photographic appliances would be highly interesting, and at the same time instructive, even now as well as in the future, as showing what was accomplished in the early days of the art, and by what means. It would also often show that modern inventions were really old ones that had become forgotten. Mr. Bayley's paper shows that the Royal has at present a small, very small, nucleus of a collection in the form of early examples of photography. Some other societies have collections, though unfortunately they are seldom seen. The Photographic Club, for example, has some very early apparatus, and a very fine collection of ceramic photographs done by Lafon de Carmarsae, and, we believe, by Joubert, between thirty and forty years ago; also many fine Daguerreotypes and glass positives of about the same age and older.

A Museum Desirable.—There cannot be a divided opinion that a museum is desirable, and that no time should be lost in its formation. Photography has passed its jubilee, and the number of the earliest workers who can explain the old processes and apparatus is becoming fewer and fewer year by year. Even now some strange notions exist amongst modern writers as to the early photographic processes. For example, a writer in one of our contemporaries some time back glibly described the Daguerreotype as a picture developed on a silver plate, "and intensified with bichloride of mercury." The calotype and the wax-paper processes are frequently confounded by modern writers as being the same. So with the old compound toning and fixing bath and the sel-d'or bath. These and other perhaps more flagrant errors may, unless checked, be handed down to posterity, and accepted as facts. Again, how many of the present generation of photographers would know an iodising and bromising box, or a mercury box, if they saw it, to say nothing of its use? There is yet another reason why no time should be lost in the formation of a permanent museum. Early apparatus is getting scarcer and scarcer every day. It is too often treated as useless lumber, and for that reason is frequently destroyed or converted to other purposes. We know of an instance of a Johnson's pantoscopic camera being destroyed because some of its parts could be made useful for something else. That a permanent museum is desirable is incontestable; and where shall it be? Have the Royal accommodation for it in its present rooms? We put these questions for the following reasons.

Examples at South Kensington.—It may be new to the majority of our readers that an excellent and representative collection is, or was, in existence. The past tense is included because, as we shall presently explain, we are in doubt on the subject. At the Inventions Exhibition, 1885, the Photographic Society got together a very interesting loan collection, illustrating photography from the earliest period. From what we remember, it included bitumen pictures, by Niépce, on metal plates; Daguerreotypes and apparatus for their production; Talbotypes; the first book illustrated by photography; a model of Swan's original machine for making carbon tissue; the first photographic lens made by the late Andrew Ross, which antedated Petzval's calculations; Archer's fluid lens; Sutton's panoramic lens and camera, &c. At the close of the Exhibition the whole of this collection, with two or three exceptions, was transferred, presumably on loan, to the Science and Art Department of the South Kensington Museum. There it was—we had nearly written stowed away—deposited in a glass case in a corner of one of the topmost galleries of the buildings, which no one seemed to visit—but there it was for some years. Where the collection is now we cannot say, for on our last visit to the Museum we could not find it—evidently it had been removed. Although we made inquiries of several of the police attendants, we could not learn its whereabouts, or even if it were still in existence. This is a matter that the Royal, that got the collection together, might do well to inquire about. Perhaps, as it was not alluded to the other night, it has become quite forgotten. If the collection is still in existence—and we sincerely hope it is—it seems quite lost to photographers where it is; therefore, as it is, for the most part, on loan, the lenders would probably prefer it to be transferred to some more central place, where it can be the better seen and appreciated.

A Collection of Portraits.—Among the suggestions made at the Royal was that a collection of portraits of the pioneers of photography was also desirable. There used to be shown at the South Kensington Museum several dozen whole-plate portraits of scientific men, taken thirty years and upwards ago. Amongst them were a number of the chief pioneers of photography. On more than one occasion in the past we have called attention to this collection and its then state, though so old, and suggested their reproduction, as some few showed signs of decay. On our last visit the portraits had disappeared, and we could not learn what had become of them. It may be that we were not energetic enough in our search for them, as well as the other collection; but one thing was made evident to us, namely, that South Kensington is not the place for a photographic museum.

JOTTINGS.

ACETYLENE is the topic of the moment among practical photographers. Probably the generators that have so far made their appearance on the market are but the forerunners of more effective forms of apparatus which experience alone can suggest. It is, however, already clear that the generation of the gas within the gas-holder itself is not the best system to adopt, for, not to mention other though minor, disadvantages of using such forms of generators, it is impossible to recharge with the carbide while the acetylene is burning. I fully anticipate that, when the light becomes better known and understood, the presence of a quantity of acetylene in holders having the capacity of several hours' or nights' supply will be a feature of every photographic establishment. Acetylene is as simple and harmless in use as house gas; it is made as easily as was oxygen in the old gas-bag days, while, as an illuminant for optical lantern, enlarging, and portrait purposes, it perhaps in itself combines most of the good qualities of the electric arc, the oxyhydrogen, and the oil lights. I strongly recommend my professional readers not to be dissuaded by the timidity of the insurance companies from giving the light a trial.

The Photographic Salon and the Linked Ring have lately come in for some severe, but just, criticism, both with regard to the manner in which the Piccadilly Exhibition is conducted and the literary performances of some of the younger Links, by which, if they are wise, those most concerned will endeavour to profit. Mr. Henry W. Bennett goes to the very foundation of the reason why the Salon and the Ring are regarded with such extensive disfavour when he twits the members with an "assumed superiority over all photographic workers so frequently and so aggressively asserted." Photographic Podsnappery it might be termed, for Mr. Podsnap, you may remember, was a very superior person. I see that Mr. H. P. Robinson affectionately refers to the Salon as his own pet child,—an adopted one of dubious parentage, by the way—and is pleased to think that it is imitated in outward dress. I am confident Mr. Robinson will join me in the hope and the belief that in future the honesty and good sense of photographers generally will assure the Linked Ring and the Salon the unassailed possession of those features which have made both institutions what they appear to be in the eyes of observant outsiders.

Mr. Bennett's scathing indictment of the Linked Ring and the Salon has brought no official reply. It is a formidable letter to answer, and possibly therefore Mr. Maskell is wise in keeping silence. You see, it is so easy not to write letters to the papers when, metaphorically speaking, your critics have left you without a leg to stand on. However, during the bad time that he has been

having lately, Mr. Maskell has, doubtless, consoled himself by the thought that ridicule, hard knocks, and unappreciatedness fall to the lot of most pioneers. I conclude my references to the Salon for the year 1896 by quoting the following passage from the London correspondence of the *Indian Photographic Society's Journal*. The writer's contributions are invariably marked by knowledge, discrimination, and thoughtfulness: "If only the Linked Ring will give up its rather undignified appeals for flattery and commendation, all biassed critical feeling must very soon disappear in the presence of such broad and masterly art-work as it has this year brought together for public appreciation and guidance." Very good advice. Take it, gentlemen of the Ring!

The publication in these pages, a week or two back, of the conditions under which the Council of the Royal Photographic Society makes an award of the Society's Progress Medal is a reminder of the circumstance that this more or less coveted distinction will shortly come before the Council for disposal. I am not about to discuss its probable destination, though I may say that I should not at all grudge its bestowal on Mr. H. P. Robinson in recognition of the progress he has been instrumental in imparting to the Society during the last five years. This, however, by the way. In glancing down the list of recipients, it appears that Abney (twice), Willis, Warnerke, Woodbury, Eder, Waterhouse, Emerson, and Dallmeyer figure upon it. I remark that the Society appears entirely to have overlooked the valuable optical work of Rudolph, Von Hoegh, Schroeder, Dennis Taylor, and others during the last seven or eight years. Surely the solitary award made for photographic optics is an under-estimate of the advances recently achieved in this branch of photographic science?

Some of the new movements in photography, or rather the photographic world, have a progressive character not always found associated with undertakings promoted by bodies of photographers, whose reputation for conservatism is only too well deserved. The Convention Council has created a noteworthy precedent in resolving to endow rssearch work. I have little doubt that, carried out with care and deliberation, the scheme is one calculated to be of benefit to photography. Certainly, the Council do not lack admonition and advice from persons who, while themselves incapable of initiating ideas of a progressive nature, are ready and eager to pour cold water on the suggestions of others. The research scheme of the Convention has been subjected to a great deal of uncalled-for carping. I see no reason for supposing that the Convention money is more likely to find its way into the wrong channels than are the guineas of the Affiliation Committee, which just now appear to be lavishly expended on lectures that can scarcely be admitted to have more than a very restricted beneficial scope.

With regard to the proposed technical Exhibition no hostile criticisms or objections appear to be forthcoming. The field awaiting occupation by the Royal Photographic Society has been lying fallow for years, for, since the Crystal Palace display of (I think) 1890, no representative Exhibition devoted to apparatus, or to the illustration of processes, &c., has been held in London. To be successful, the proposed Exhibition must be organized on broad and comprehensive lines, and the participation of those engaged in the various industries and sciences upon which photography relies for its well-being frankly sought for. The suggestion thrown out in these columns that the collection should be retrospective to the extent of, say, five years, is an excellent one, in view of the fact that, during that period, no adequate opportunity has been provided for completely showing the actual position of photography in its industrial, scientific, and commercial aspects. I hope that, when the Society has got over its internecine troubles, the subject will be taken in hand.

It is seldom that a number of this JOURNAL does not appear without it contains the expression of a professional photographer's grievance against such irritating forms of competition as free or excessively cheap portrait schemes—the coupon system in one of its many disguises; attempts to induce photographers to take photographs for nothing, and so forth. I am aware that some prosperous members of the profession affect to doubt the wisdom of photographers seeking publicity in these and similar matters, and are sceptical that any good result ensues; but I am very much mistaken if a careful perusal of these pages for the last six months would not reveal instances where the publicity given to some of these doubtful schemes has not prevented many photographers availing themselves of them, and deprived their originators of much of the illicit profit they were striving for. Affluent persons who sneer at their less fortunate brethren for "writing to the papers" do not realise that to many a struggling little man the friendly columns of a representative paper are the only means he can find for making his voice heard against attempted injustiee, swindles, and knavish tricks of trade.

By the time my next batch of "Jottings" appears in these pages a new year will have opened. It is rarely that an anonymous writer in a journal can say that among its readers in all parts of the world he has, despite his anonymity, accumulated innumerable friends; yet this is the pleasant experience of the author of these lines. To those friends—and, indeed, to all—I beg to be allowed to wish every prosperity in the year 1897.

COSMOS.

FOREIGN NEWS AND NOTES.

Mechanical Intensification.—It was recently pointed out before the Société Française de Photographie that, if a film be treated with formaline after development, and then washed and placed in alcohol, it will contract more or less according to the strength of the alcohol and the duration of the immersion, and that by this contraction the negative is intensified. It is suggested that ninety-five per cent. of alcohol be used, to which forty per cent. of glycerine has been added. If the contracted film be placed in water, it will absorb the same, and extend to its original size and intensity. It has, of course, long been known that a film which has been allowed to expand in stripping with hydrofluoric acid gets thinner, but this is the first time that a contraction and intensification has been observed.

Mercury Toning.—Mercier pointed out in, in his well-known work, *Virages et Fixages*, that gelatine and collodio-chloride prints can be partially toned with mercuric chloride with success. A writer in the *Bulletin de la Société de Bourgogne* now points out that such a toning process is extremely useful when the lights are slightly yellowed. If the prints have been toned with gold to a purple, they turn to a fine carmine. The procedure is merely to immerse the print, well washed after toning and fixing, in a bath composed of—

Mercuric chloride	1 grain.
Salt	20 grains.
Water	8 ounces.

It is stated that the results thus attained are quite stable after washing without any fixing.

Artigue's Paper.—Herr Watzek points out in the *Wiener Photographische Blätter* that, instead of using gum arabic in the Artigue process, gelatine may be employed, if it is used in a liquid state. The image can be obtained of a finer grain and adheres more firmly. As a suitable formula is recommended:—

Gelatine	40 grains.
Chloral hydrate	25 ,,
Water	100 minims.

By using this, the developer may be employed cold, and hastened by the addition of a little carbonate of potash, and it is only necessary to use sawdust to clear up the whites should they show at all dirty. The surface of the paper, seeme to have no effect when gelatine is used, and the paper is more sensitive and keeps better than that prepared with gum. It might be possible to replace chloral hydrate with glacial acetic acid or some other solvent of gelatine.

Aluminium as a Support for Collotype Plates.—In the current number of the *Photographische Correspondenz*, A

Albert suggests the following method of working:—New sheets of aluminium should be cleaned with a mixture of ammonia, 1 part; water, 3 parts; and then well dried with a cloth. If they have been previously used for collotype, they should be freed from the gelatine film by treatment with dilute sulphuric acid 1:30, well washed with water, and then treated with ammonia and water, as suggested above. The best substratum is waterglass and beer, without any caustic potash. To coat the plates with gelatine, the aluminium should be laid on plate glass and then coated. It is much easier to print on aluminium plates than with glass, as the metal can be turned back like paper, and it requires less printing. For damping these plates in printing, a mixture of glycerine and water only must be used; no ammonia or hypo should be used, as these attack the metal. Printing from these plates is much easier than from glass, as the ink shows up much better, particularly by artificial light, than on glass.

Toning of Bromide Prints.—According to Valenta the following procedure will give any desired colour on bromide paper, developed with any of the alkaline developers. Ferrous oxalate must not be used. The print should be soaked in water in a flat dish till soft, then drain off the water and apply the following solutions as directed.

Solution A.

Uranium nitrate	5 grains.
Water	1 ounce.

Solution B.

Potassium ferridcyanide	4 grains.
Water	1 ounce.

Solution C.

Ferric chloride	4 grains.
Water	1 ounce.

For sepia brown tones, mix 9 parts of *A* with 1 part of *B*, and the toning should be allowed to continue for from six to ten minutes. The tones range through black to sepia, bistre, dark sepia, and vandyke brown. For brownish red tones mix *A* and *B* in equal parts and tone for six to eight minutes. For orange red tones, mix 35 parts *A* and 75 parts *B*.

For bluish-green mix *A* and *B* in equal parts, and tone till one image is a dark sepia brown, and then wash well, and then treat with a mixture of the part of *C* with 5 parts of water. Toning will take from two to four minutes and the print should then be washed and dried.

For blue tones the print should be treated with equal quantities of *A* and *B* till a brownish-red colour is obtained, and then washed and treated with *C*, when in about three minutes the desired tone will be reached.

Blue Tones on Celloidin Paper.—Lainer describes the following method of preparing a bath to give blue tones on celloidin paper, which would, doubtless, also answer for gelatine and collodio-chloride paper. Two grains of ammonium sulphocyanide are dissolved in 10 c. c. of water, and heated almost to boiling point, and then 30 c. c. of a one per cent. solution of neutral gold chloride should be added, in quantities of 3 or 4 c. c. at a time, and, after each addition, the solution heated till the red colour first formed disappears. The solution should be allowed to cool and filtered, and kept for stock. To every 100 parts of a five per cent. solution of ammonium sulphocyanide five parts of this solution should be added. In this bath a print will assume a pure, soft blue tone in four or five minutes, and this can be seen on examining the print by transmitted light as usual. The use of a fixing bath with some sulphite in it will tend to give pure whites.

THE THEORY OF DEVELOPMENT.

III.

So much for what goes on during and after exposure. On the application of the developer, the first result is the decomposition of the nitrate of silver adhering to that contained in the film, and, whether the developer be pyro, or iron, or gallic acid, this involves oxidation of the developing agent, reduction of the silver to the metallic state, and possibly, as suggested by Brande and Taylor, liberation of hydrogen. When this process commences, the liberated hydrogen commences its reducing action in different directions; it combines with the remaining atom of iodine or bromine in the sub-salt which is reduced; also probably attacks the newly formed iodide or bromide of silver on the surface of the film, which, being comparatively unprotected, suffers easy reduction, and it will also reduce the silver nitrate, with which the developer now becomes mixed. The process is not an instantaneous, but a continuous one, and, as the different substances—the iodide, sub-iodide, and nitrate of silver—are respectively reduced, the liberated iodine combines with the fresh silver from the developer so long as any remains unreduced.

Then, as fast as the sub-haloid is reduced, the halogen recombines with fresh silver before it can escape out of the film, or, if it reach the surface, it is reformed into iodide or bromide, to be again reduced, and so *ad infinitum*. What becomes of the nitric acid I will not venture to say with certainty; but, as the action of the developer gets weaker as it proceeds even though fresh silver be added, it is set free to act as a gradually increasing restrainer.

If we imagine some such interchange of elements to proceed, it is not difficult to see how the reduced silver is found in the exposed part of the film without the necessity for supposing it to be attracted there by electrical means. On the contrary, my hypothesis is, that it is not deposited from the developing solution in the metallic state, as usually supposed, but is attracted to the surface of the film *in the form of iodide or bromide* by the hydrodic or hydrobromic acid derived from the decomposed haloids, and is then, in consequence of its unprotected condition, reduced by another portion of the developer. Meanwhile, the exposed and reduced haloids undergo reformation, and so the film retains its original formation.

The upholders of the molecule theory will, no doubt, argue on the basis of Carey Lea's experiments quoted a few weeks ago by Mr. A. D. Pretzl, that this chemical explanation does not fit in with observed facts, notably with the persistence of the latent or developable image; but I shall try and show that the two are by no means antagonistic. The experiments referred to have to do with the removal of the developed image by acid nitrate of mercury or nitric acid when the film is found to be entirely unaltered in constitution, and, what is more, is capable of having the image reproduced by a second, and third, and fourth application of the developer. This is held to prove the physical character of the action of light; in other words, that the latent image consists only of particles of silver in a state of molecular excitement.

My own view of these successive redevelopments is that they are not due to any action of light at all, but simply and purely to chemical causes. For instance, take a plate developed with alkaline pyro and treat it with nitric acid to remove the image. The result will be, not a restoration of the film to its primitive condition, but a reverse of the original image in which the picture is formed in bromide of silver. Now wash this well, and apply a developer of acid pyro and silver, and *the image will be restored in all its original gradations*. In other words, the more complete the absence of silver, the more transparent the film, the greater the quantity of silver deposited there. Can this be considered the result of particles of silver in a state of molecular excitement?

Has any one—I do not recollect to have seen such an experiment recorded—tried the experiment of treating an exposed and undeveloped plate with nitric acid and *then* developing an image? I think in such a case the result would be entirely negative. I see on p. 726 (November 13) an experiment of Dr. Reissig's is quoted by Mr. Pretzl, which bears out this view. An exposed plate treated with iodine prior to development gives no image. Captain Abney, twenty years ago, showed that oxidising agents, generally nitric acid among the number, destroy the latent image and prevent development. How, then, does it happen that in Carey Lea's experiment the image is reproducible? Can it be that there is a physical as well as a chemical action, and that the physical image is not so removable? I do not think so.

Let any one try the following experiment, and I think it will throw a little light on the cause. Take a wet-bath plate and wash it well, not too thoroughly, but sufficiently to remove the free silver; or, better still, take a collodion-emulsion film which has no free silver in it, and drop two or three drops of solution of silver nitrate on different parts of the surface, and then wash again, this, of course, in the dark room. Now apply a developer of acid pyro with or without silver, and it will be found that wherever the silver has been dropped, a deposit will be produced, weak if no silver be added to the developer, but reaching any strength if silver be employed.

The bearing of this upon the question is just this: In Carey Lea's experiments, and in the one I quoted of the removal and reproduction of a chemically developed image, the development is, I believe, entirely due to what I may term silver stain. The portions of the film where the image has been removed are, in the very act of removal, submitted to the

action of free silver; the collodion is, in fact, partly impregnated with it, and this suffices to set up development with acid pyro and silver in just the same way that a dirty plate will reproduce all the streaks and smears it bears. But, surely, no one would set down that result to molecules of silver in a state of excitement. In the case of the reproduction of the chemically developed image, the denser proportion of the original image will, of course, be subjected to the action of stronger solution of silver when the image is dissolved out, and, indeed, the same holds goods of the physical image; and this accounts for the reproduction of a stronger image or deposit on those parts.

If, instead of simple nitric acid, a mixture of that acid with a soluble bromide be used, or hydrobromic acid, chromic acid, and a soluble bromide, or, indeed, any reagent or combination that will destroy the organic compound of silver and convert it into bromide, then no reproduction of the image can occur. Is this treatment to be supposed to allay the "molecular excitement?" If so, why?

Over a quarter of a century ago I upheld the electrical theory, but during that period there is plenty of time to think things over, and possibly to recant. I have done so, and this must be my explanation.

W. B. Bolton.

PHOTOGRAPHIC WORKERS AT WORK.

XII.—Messrs. G. W. Wilson & Co. at Aberdeen.

The good ship, *Ban Righ*, landed us recently in the granite city of the North, after thirty-eight hours of delightful separation from the turmoil of London life. Passing through the city on our way to St. Swithin-street, where Messrs. Wilson's works are situate, we could not but admire the magnificent pile of municipal buildings with its graceful spire and the long vista of Union-street flanked with massive granite structures, broken in its severity by the beautiful public gardens in Denburn Dell.

Upon arrival at the works, we were received most cordially by Mr. Louis Wilson, the managing director, and, seated in his office, he gave some account and many interesting particulars of the growth of this business, which now enjoys a world-wide reputation for its photographs and lantern slides. The firm originated early in the fifties, when Mr. G. W. Wilson, a portrait-photographer, turned his attention to landscape work. His first publications were stereoscopic slides. These were followed by *carte-de-visite* views, which for a time enjoyed great popularity, but in turn they have had to make way for the more attractive unmounted print. Still more recently opalines have been first favourites, but fashion in photographs, as supplied by the publishing firms, is now transferred to goods mounted in plush. Two or three years ago there was a temporary revival of stereoscopic pictures. The demand came from America, and the boom was of short duration.

In answer to our question, Mr. Wilson remarked: "Our business grows more complex year by year. It may seem incredible, but we can supply a photograph in two hundred different styles. Such variety would, of course, necessitate an unmanageable stock. Our customers are sometimes unwittingly exacting, and think we should have stock of anything they may require, but with over forty thousand subjects it is an impossibility. This is our catalogue for 1871, a small volume, $3\frac{1}{2} \times 5\frac{1}{2}$ inches, containing forty-six pages. Our present catalogue comprises twelve octave volumes of 120 pages each. The landscapes are mostly English and Scotch, but we have sent operators to Australia, and one has just returned from South Africa. In addition to photographic prints, we do a fair volume of business in lantern slides. We do not publish religious, temperance, or comic series, although these command the largest sale. Our subjects comprise landscape and educational series, such as geology, trees, and historical portraits. This letter is an acknowledgment from the Birmingham School Board, for whom we have just completed an order.

"You inquire about prices. Of course they have fallen, as there are now so many competitors. I should estimate prices now at about one-third of what they were in the early years of the business. Reverting to those times reminds me that the first medal taken by my father was for improvements in calotype."

We then passed into the store-rooms, and found a most varied stock of mounted and unmounted photographs, and tiers of drawers filled with lantern slides. We inquired if the public had shown any desire to be supplied with pictures of the art type seen in these latter days at our Exhibitions.

"No, none whatever. I must say we are simply photographers, and my experience is that most dealers care little or nothing for the merits of a photograph. They look at size and price, and, if one picture is a little larger than another, no matter what its quality as a photograph, the larger picture will secure the order. We once tried to introduce a series of pictures of a much higher order, but the venture was an absolute failure."

Returning to the business aspect, we inquired if subjects had frequently to be renewed.

"Some pictures soon get out of date owing to changes in landmarks and alterations in buildings. Look at this photograph of a seaside resort. In the distance you will see a small wreck, of no moment as a factor in the picture; but the wreck is gone, and we have had to send an operator a long distance to make a fresh negative, because that wreck in the old photograph makes it out of date. You will think it incredible, but we have had to take fresh negatives, for no other reason than the change of a shop sign or other trivial alteration."

Leaving the store-rooms, we entered the works, and were introduced to Mr. Belton, the able manager of the printing department.

The works are divided into two sections, separated by a lane, one side being reserved for the Scotch views. We first entered a building of considerable length and some breadth. This provides accommodation for the storage of negatives and apparatus, the filling of printing frames, and rooms for washing, toning, fixing, and drying prints, and the sensitising and drying of albumenised paper. In front of this building is a glass structure for printing, when the weather is unfavourable, and beyond this glass lean-to is a large space fitted with frame stands, where most of the printing is done. We were especially impressed with the systematic arrangements for the control of waste.

Each printer is kept in touch with his work until it reaches the stock-rooms, and in this way an interest is created in the production of good work. To obtain an idea of the organization of the work, we selected a subject in the catalogue at random. Within two minutes the negative was brought to us from its place on the grooved shelves at the back of the building. It is then sent to the printer with an order form. The printer keeps a daily record of his work, the quantity of paper received, the number of prints made, and the number rejected. The prints then pass into other hands for toning, fixing, washing, and drying. Each printer's work is kept separate, and the number rejected at each stage is recorded. The figures are tabulated, and a monthly abstract of the waste at each step is made. This system permits of the loss being localised with ease and certainty. As a testimony of its efficiency, we may say that the percentage of waste from all causes is low down in the units.

The arrangements for washing after fixing are also very interesting. A frame resembling an inverted Chinese umbrella, of exceptionally large size, forms the support for the prints, the ribs being interlaced with twine. A pipe, perforated with numerous holes, traverses the diameter of the frame at some distance above the prints, and throws a continual spray of water upon them. The frame is kept in rotation mechanically, and the time of washing for each batch of prints is fifteen minutes. The prints are thus subjected to a constant stream of running water, and we were struck by the harmony of the practical experience of a large firm like Messrs. Wilson's, with the experiments recently made by Messrs. Haddon and Grundy concerning the washing of prints. At the end of fifteen minutes no trace of hyposulphite of soda is discoverable in the washing water.

The greater part of Messrs. Wilson's prints are on albumenised paper, but platinotypes and carbon prints are also produced. Outside the building are eight large tubs, into which all waste solutions are run for recovery of the precious metals. These are a valuable asset, and the return from the refiners is about fifty-five per cent. of the residues.

In the drying-rooms on the first floor provision is made for the supply of artificial heat when required. The mounting-rooms also are on this floor, and we see tanks of gelatine in solution, at which workers are deftly mounting prints in optical contact with glass, this being now an important feature in the Company's business. The rooms for the production of lantern slides adjoin. Only the wet-collodion process is used, and all the slides are toned with gold to the peacock-blue characteristic of the firm's work. Some beautiful specimens were exposed and developed in our presence, and revived lingering regrets for the days of old, when wet collodion reigned supreme. This department is under the supervision of Mr. Charles Wilson. The firm still continues the old-established portrait business in Crown-street, where Mr. John Wilson has charge of the management.

PRODUCING PHOTOGRAPHS IN RELIEF.

Mr. T. C. Marceau has patented certain improvements in the art of finishing and mounting photographs after they have been taken, and the

invention is especially designed to throw certain parts of the picture up into relief above the plain surface.

It consists in certain details of construction which are more fully explained by reference to the accompanying drawings upon, which

Fig. 1 is a view showing the manner of outlining the picture upon the surface in which the corresponding intaglio is to be produced.

Fig. 2 is a view showing the means for registering the pictures which are to be afterwards thrown up into relief.

Fig. 3 is a vertical section through the mould.

The object of the invention is to simplify the methods of making relief pictures, so that any number of such pictures may be made to accurately coincide and correspond with each other.

"In carrying out my process," says Mr. Marcean, "I first prepare a photographic negative in the usual manner. The pictures are then taken from the negative upon films of sensitised paper, and the outline of those portions which it is designed to show in relief is cut out from one of these sheets, and pasted upon a surface of glass as shown at A.

"The paper upon which the pictures are taken is all cut of a certain size, and the negative is marked, so that this paper is always laid in the same position upon the negative for printing each picture. The pictures are therefore all in identically the same relative position upon the paper, and they all correspond with the one from which the outline was cut for the purpose of making the intaglio block.

"The exterior portion of the paper from which the outline has been cut now serves as a pattern for the exact registry of each of the pictures

Fig 1.

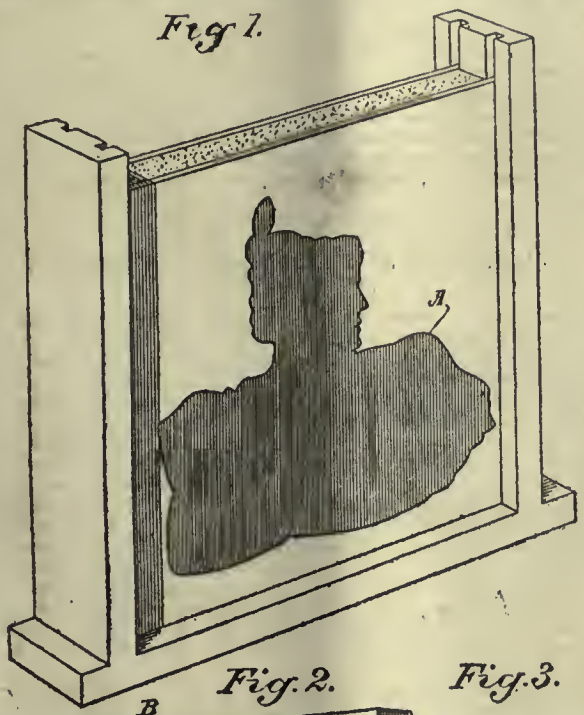


Fig. 2.



Fig. 3.



which are to be thrown up into relief, and is afterwards used for this purpose as will be hereafter more fully explained.

"The surface, A, upon which the figure is pasted, as previously described, forms one side of a mould, the space between the two sides being sufficient to provide a necessary thickness, and the sides being also connected by edge strips so as to form an enclosure, as shown in fig. 1.

"Into this enclosure I pour plaster of Paris or other plastic material which will afterwards set and become hard, filling the space within the mould.

"The plastic material flows around the figure which has been pasted upon the glass, and this figure, projecting the thickness of the paper above the surface of the glass, will form a corresponding indentation in the material with which the mould is filled, and which indentation remains after it has set.

"The mould is then opened, and the hardened material is taken out, the outline or figure is removed from the face of the plaster, if it has adhered thereto, and the perfect outline remains upon the surface.

"The surface of the block is now excavated or engraved out in the usual manner for producing intaglios, so as to form the various features of the picture to greater or less depth, as the shade or contour of the picture demands and the taste of the artist shows to be proper.

"When this is completed, it is in readiness to receive the pictures which are to be thrown up into a relief corresponding with the depth of the intaglio which has thus been formed.

"The part, B, from which the figure was cut to form the outline upon the block, is now pasted, or otherwise attached, to the block, forming an accurate peripheral outline around the intaglio, and, as all the pictures are in exactly the same relative position upon the printed sheets, it is only necessary to register the edges of each sheet with that upon the block, to register each picture with the intaglio. The picture is wetted, and then pressed into the block by any of the usual or well-known means for producing raised surfaces, and those parts of the picture which are designed to be thrown up into relief will be correspondingly forced into the various depressions of the intaglio in the block, remaining there under pressure until dried, after which they can be removed, and the pictures mounted in any usual or well-known style for mounting such pictures.

"If preferred, any suitably prepared block may be used, and the outline within which the engraving or intaglio is to be made may be marked upon the surface of the block, by laying the cut-out figure thereon and outlining it, and afterwards engraving the block.

"A convenient method for effecting this is to lay the picture to be produced in relief upon a supplemental sheet, which is properly proportioned to the block, and then to cut the outline of the picture, and at the same time cut through the supplemental sheet beneath, the two sheets being secured together so as to remain in the same relative position until the cut has been completed.

"The supplemental sheet may be made of any suitable material. I have found that collodion in thin sheets makes a very satisfactory substance for the purpose, but it will be manifest that other materials may be used without departing from my invention. This supplemental sheet is then laid upon the block, to which it is temporarily fixed by pins or clamps, and the outline which is to be engraved in the block is marked by following the outline of the cut. The sheet may then be removed and the engraving of the block completed. The pictures to be thrown into relief are then fitted to the opening in the supplemental sheet, and the picture and sheet are placed upon the block, the face of the picture coinciding with the intaglio which has been cut in the block, as in fig. 2.

"This registration is ensured by passing pins through the holes already made in the supplemental sheet and through the picture, these pins entering the holes previously made in the block, and after this is effected the pressure is applied to throw the picture up into relief by pressing the parts of it into the intaglio in the block.

"The claims are for:—

"1. The method of forming photographic pictures in relief, consisting in cutting out one of a set of pictures and outlining it upon a block formed by hardening a plastic mass within a mould, engraving an intaglio upon the block to correspond with said outline, then registering the other pictures upon the block, and pressing the portions coincident with the engraved surface thereinto.

"2. The method of forming pictures in relief, consisting in cutting the outline of one of the pictures and a supplemental sheet upon which it is overlaid, indicating said outline upon a block, and engraving an intaglio in said block corresponding with the outline, fitting the pictures successively to the opening in the supplemental sheet, inverting them and the sheet over the engraved surface, and retaining the pictures in register with said surface, while they are pressed thereinto by uniting the pictures and the supplemental sheet and entering corresponding holes in the block.

PHOTOGRAPHIC CHEMISTS AND PHOTOGRAPHERS.*

As things are at present, it is by no means a fancy picture to say that, so busy is a modern pharmacist with goods foreign to his actual profession that, when, by chance a prescription does come in, it is looked upon as an unqualified nuisance, I have felt that way myself scores of times; while as to *poisons* the less said the better; for my part, I run no risks; and, therefore, considering this state of things, what possible action can the Pharmaceutical Society take against the "Company Pharmacy?" So much is written by devoted adherents of the Pharmaceutical Society against the "Company" Pharmacy of a totally misleading character that it is really a kindness to put things

* Concluded from page 778.

sometimes in a clearer light. They judge these matters from an outside view and by hearsay only. It is quite a mistake to say that the founders of these big companies know nothing whatever of pharmacy; my experience is, they know everything that is to be known, their business aptitude is marvellous. I refer, of course, to those who have initiated their own gigantic systems, and, with their own and other people's money, established these big concerns. I can speak personally of one of the largest. I know that every shop has its own qualified manager, that there is a "relief" staff of qualified men in case of illness or holidays, that all *dispensing* is done by qualified men, that all the shops are most completely equipped, that the drugs sold, selected, and prepared by and under the immediate direction of specially qualified men are in many cases greatly superior to those sold by ordinary chemists. I know one firm of chemists whose tinctures are mostly under proof, and whose "faking" is simply monstrous. I know one town where the "Society" could get convictions in shoals; but it is plain that is not what the "Society" cares to do against their own adherents. It does not *pay* (to put it on a low ground) the "Company Pharmacy" to "fake" and do contrary to law; it would be impossible, there are too many people about, too many "spies" on the watch; but no one watches the ordinary chemist, *he* may keep his "spirits of nitre" until the ethyl nitrite is almost a vanished quantity; but woe betide the store or company! The ordinary chemist may "improve" his "spermaceti or *simple* ointment" until it becomes "lard," but not so the Company.

Of course, what is said of "covering" is mostly nonsense. In *one* large shop may be *twenty* employees; I know three such, in different towns. There are two qualified men at the drug counter and two juniors; there is another qualified man in the dispensary; the remainder are lads, cashiers, and ladies at the various toilet and fancy counters; this is in a Company Pharmacy. Where is the "covering?" Does it require a qualified man to sell a comb or hair brush? What about the ordinary chemist's *apprentice*, who sells daily for his master "white precipitate" in penny packets and suchlike scheduled pennyworths? The ordinary chemist often "covers" a round dozen of juniors and apprentices, and breaks the law hourly.

As regards payment, your readers interested in their boys' future need pay little attention to the 90*l.* statement. The three qualified men above referred to share between them 600*l.* a year. I don't know one who makes less than 120*l.*, and commissions will often make this 140*l.*; the man is an idiot who takes less.

The drug trade is, no doubt, from a series of mischances, in a parlous state; there has been legislation, and examinations stiffer year by year, as if ours was a high-class profession, and we were all to be—well, dispensing chemists; the adjective is, for the most part, a farce.

The "poor chemist," it will be seen, has a lot to put up with, take it all round. It is as if a lad pays a premium and at great cost serves a long series of years with a firm of photographers, passes a stiff examination in chemistry, anatomy, and the higher branches of photography, then finds his work mostly confined to the *framing of pictures!*

But, after all, there is money in the drug trade yet. I mean, of course that branch of industry which is called the drug trade. As times go, the qualified chemist can get as good, or better, living as any one else; it is quite his own fault if he does not. But naturally, if he seldom has a chance of exercising his profession, it is only to be expected that he will forget things and get rusty: his botany and chemistry will, for the most part, "go by the board." All "medicos" are not clever by a very long way, and only a few know anything of pharmacy, although they think they do.

It must be easily understood why it is difficulties are often put in the way of sales of certain photographic chemicals. We are, for the most part, in dread of the bullying coroner, and when it comes to the point, and you are asked by a stranger for a little "bichloride," you don't care to risk it, although you may be pretty certain that his application is quite *bonâ fide*. It might suffice for the touring amateur to show a membership badge or card of his favourite society. It is a well-known fact that purchasers are often obstinately reticent when asking for these goods; they forget or do not know that the chemist must be certain of his customer, and then the "stranger" clause is difficult to get over. The purchaser *must be known* to the seller. It is a troublesome thing all round. My own rule is to stick closely to the Act, but make an offer of my dark room and chemicals, and very often this cuts the knot and leads to better business. Undoubtedly the *seller* ought to be protected; having done his duty laid down for him by law, any fatal result, by no means *his* fault, should not render him liable to abuse in open court. It is only fair to say coroners are not all alike in this matter, and I know for a fact that some of them, having ascertained by private inquiry that the sale has been in form and legal, do not trouble to call the vendor; they understand perfectly well that poisons *can't* be procured in small quantities if not in large, not from one, but twenty different chemists.

One is almost forced to conclude that some remedy must be found for a state of things which threatens to become intolerable. Would a revival of the old "Assistants" examination and qualification do any good (providing larger numbers of trained men for the retailing of certain scheduled goods)? But really the assimilation of an assortment of scientific subjects does not give a man the most important acquirement in the vending of poisons—*discretion*. D. D.

PHOTOGRAPHIC COPYRIGHT IN NEW ZEALAND.

Mr. A. Martin, photographer, of Wanganui, New Zealand, kindly forwards us a copy of the Photographic Copyright Act, 1896, of New Zealand, which we append. It is entitled "An Act to Protect Certain Photographs."

"1. The short title of this Act is 'The Photographic Copyright Act, 1896.'

"2. The protection of the copyright law shall, in respect of photographs other than portraits of persons or of groups of persons, or photographs of any subject, for the taking of which valuable consideration has been given, apply in all respects as if such photographs had been duly registered and protected under such law in favour of the person or firm taking and producing such photographs, for a period of five years from the date of the first taking the same, if the word 'Protected,' followed by the name of the person or firm taking such photographs, and the true date of such taking, are made part of the original plate, and clearly appear in each reproduction thereof.

"3. Any person publishing any copy of such photograph without the authority of the person or firm protected under this Act shall be liable, on conviction, to a penalty, in respect of each copy so published without authority, not exceeding 20*s.*, and all copies so published without authority may be ordered to be destroyed. Proceedings under this section may be by way of summary procedure before any two Justices of the Peace.

"4. Any person who shall inscribe on the original plate, or publish on any reproduction thereof, the particulars intended to confer protection under the second section of this Act in respect of any portrait or photograph excepted from the protection conferred by that section, and also any person who shall in any way reproduce or publish the portrait of an individual or individuals, or a photograph for the taking of which valuable consideration has been given, without the authority in writing of the individual or individuals whose portrait or portraits have been taken, or from whom valuable consideration for photographs has been received, shall, on conviction, be liable to a penalty not exceeding 5*l.* for each offence."

SOME RECENT PHOTOGRAPHIC INVENTIONS.

[Croydon Camera Club.]

I propose taking three subjects this evening, in the following order: (1) Moving pictures upon a screen; (2) Printing by photography on both sides of the paper; (3) Röntgen rays. I shall first of all get through the demonstrations as briefly as possible, for, as you all know, there is enough in a part of any of the subjects to occupy months instead of an evening; but it is not my aim this evening to go very deeply into any of the subjects. I do not want to weary you with minute detail of what would be uninteresting at the present time; I want you to look at the three demonstrations in a very broad light, to let them suggest by themselves the possibilities of our very fascinating and instructive art—Photography; but, should we have time after the three subjects are finished to do some more demonstrations, it shall be from that one which most of you desire. If you prefer moving pictures upon a screen, I will run some more films through the lantern. If printing by photography on both sides of the paper, we can easily run another long band through the machine, and perhaps some of you could supply fresh negatives, so that you can see your own pictures printing and developed at a rapid rate. If it should be the Röntgen rays, then we can have a few more bands done, or any articles you may wish to try. I may say each subject is deeply interesting to me, and I shall be pleased to answer any question you might ask to the best of my ability.

We must remember that not one of us can have the absolute knowledge of any one subject; for instance, how could one explain a straight line if he had not a crooked one for contrast? The same with imagination. If we were to imagine all the world in this room, or, still further, all the suns, planets, stars, systems, there will be still something beyond, which imagination cannot grasp. This brings me to what I want to impress upon you. While the moving picture is upon the screen, and the printing of both sides of the paper is going on, also the shadows taken by the Röntgen rays, I want you just to have a wide hemisphere of thought and try to imagine the marvels of light, chemistry, and electricity going on between, that is to say, the light-impression upon the retina of the eye, conducted by the optic nerve to the brain, thereby leading to imagination and contrast; and, while the pictures are being developed, the latent image, the electrical energy of the developer, and a host of other chemical problems, also the marvels of electricity connected with the Röntgen rays; think of the vibrations of light of various kinds, ranging from 400 millions of millions per second, the rods and cones of the retina of the eye with half a million points within a square whose sides are only a tenth of an inch in length. There are various other matters connected with the perception of light which are of great importance to our well-being and to our enjoyment, which, of course, I will not venture to touch upon, especially the two eyes, which enable us to obtain a single vision notwithstanding that the two eyes are at work. I shall have a lot to say about this at some future demonstration, also that we can distinguish one light from another light by its colour, not by its intensity only; and we must not forget that present knowledge is only built on past experience,

therefore we must always recognise what is due to our worthy predecessors, and to others who are working at the present time to advance knowledge of any kind.

Very few know the difficulty and expense in perfecting new inventions, for what one throws away is enormous; it is like many who take photographs, they show us splendid negatives, but never say how many they have spoilt to obtain them. I think I can safely say that those who have, and those who are (and there are many in this room to-night) experimenting with apparatus for showing moving objects upon a screen, are not an exception to this rule; indeed, one would hardly think a simple apparatus like this would require the patience that it does, and yet, when you go into it and think, we can imagine why it does. First, to make the celluloid free from blemishes, that is no easy task, I can assure you, then coat it with rapid emulsion, also free from blemishes, perforating with extreme accuracy; then, to make the apparatus for taking the pictures at a rapid rate, say, twenty or thirty a second, to move the film intermittently forward exactly the same space each time, the stop for exposure, to move it on again, all this is necessary for a good set of negatives; then the developing the whole band (seventy to eighty feet) with more than 1000 pictures upon it, this must be done in one operation, for you want all the pictures to be equally good; then the printing the transparency and developing, then adjusting the same to the projecting apparatus, and see that each picture pauses in front of the lantern aperture just sufficiently long to appear momentarily on the screen and in its proper place. As each picture differs slightly from the one preceding, you obtain the lifelike effects; usually, a shutter is used to cut off the light while the film is moving, because the film usually moves half and half during each intermittent motion; but, if you make the apparatus so that the film moves one-seventh and is stationary seven-eighths during the intermittent motion, no shutter is required, therefore you have *more light and no flicker*. Here is a point where theory helps practice to obtain the desired end, for we are aware that an impression depends on the rate of excitation propagated along the optic nerve. Taking advantage of this short period, we obtain the impression of continuous motion. Instantaneous photography gives us something akin to this; yet, if we look at one picture, the movement does not seem natural, but put a lot of them through the apparatus at a rapid rate and they appear true to nature, because it is the impression which is made up of different views rapidly presented during several minute intervals of time, whereas the ordinary snap-shot photograph gives only what takes place during one of these small intervals.

I may add that sight is eminently far in advance of all our senses, and now the unaided eye sees but little compared to the hidden world which lenses and photography have brought before us, one feels he would like to shake hands with Baptiste Porta, the inventor of the camera obscura, and others who have helped our knowledge in this direction since his time. No doubt, those who were ignorant as to how the camera obscura pictures was formed, thought it was formed by some magic art—hence the name of magic lanterns—and those who worked it magicians, who were supposed to have intercourse with evil spirits. Then there is the man who invented the zoetrope, or wheel of life; then there is Muybridge, and now we have Anschutz, Edison, Birt Acres, Lumière, Paul, and a host of others, and we must give all due praise for helping (not only those in our country, but those in other countries as well) to enhance pleasure to the community, and increase their liking for science.

Printing by Photography on both sides of the Paper.

The construction and operation of the machine is based upon the proper timing, relatively to each other, of the three movements; that is to say, the intermittent movement of the sensitised paper, the up-and-down movement of the pressing plates, and the movements of the shutters. The speed depends upon your light, your negatives, your sensitised paper, and of developer; of course, you can print by reflected light or direct light.

Röntgen Rays.

No doubt, this is one of the most important discoveries of the century. It is a new form of energy, and to discover that is no small matter. Could Wedgewood, Nicéphore Niépce, or Daguerre ever have imagined that the present-day development of photography was possible?

The probability is that all Röntgen rays are not alike, and whether the wave forms are transverse, longitudinal, or resemble the circular polarisation of light, there is, doubtless, among them a considerable range of frequency. We have much to learn yet, and still have to find a tube to give us perfect definition and inteneity, and by that time some other marvel connected with it will be discovered.

W. Friese-Greene.

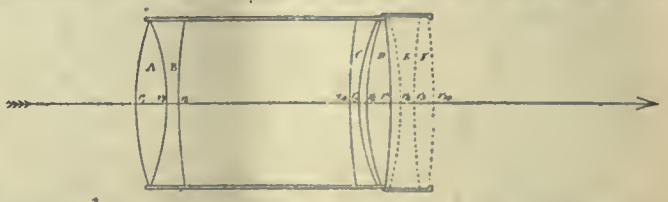
DALLMEYER'S IMPROVEMENTS IN PHOTOGRAPHIC LENSES: AN "ASTIGMATIC CORRECTOR."

Mr. T. R. Dallmeyer says:—

"In older types of lenses, especially portrait lenses, in which the character of the glasses employed necessitated a higher dispersive power to accompany a higher refractive index (a condition no longer necessarily existing since the invention of the Jena glasses), flatness of field always involved astigmatic aberration; or, if the astigmatic error was practically eliminated, the curvature of field was considerable. The construction of the best forms of the older types has been the most skilful compromise between these errors.

"The object of this invention is to remedy this defect by an astigmatic corrector, which eliminates the residual errors (of astigmatism and curvature of field) of the older forms of positive lenses, largely increasing their covering power at the expense of an inconsiderable lengthening of the focus.

"For this purpose I place behind any particular form of the old types of lenses, after having determined the residual errors referred to, my astigmatic corrector, which is calculated to eliminate these errors. The



form necessary to do this in the case of Petzval's construction consists of a negative combination consisting of a double concave lens, cemented to a double convex lens of greater dispersive material and higher refractive index.

"This reversal of material applies in every case, but the shapes of the lenses may be varied for some of the older types of lenses.

"The drawing shows my invention applied to the well-known Petzval lens made up of four lenses—A, B, C, and D.

"The lenses, E and F, shown in dotted lines, form my astigmatic corrector.

"The radii of curvature of the lenses are as follows:—

r^1 = 4·725 inches	}	A and B
r^2 = 3·735 ,,		
r^3 = 34·5 ,,		
r^4 = 9·85 ,,	}	C
r^5 = 3·405 ,,		
r^6 = 4·25 ,,	}	D
r^7 = 13·155 ,,		
r^8 = 6·95 ,,	}	E and F
r^9 = 8·85 ,,		
r^{10} = 27·5 ,,		

"The indices of refraction are:—

	μ for D line	μ for H γ line
A	1·5151	1·5267
B	1·5738	1·5919
C	1 5738	1·5919
D	1·5179	1·5288
E	1·5179	1·5288
F	1·5738	1·5919

"The claims are:—

"1. The combination with the older forms of positive lenses of a negative compound lens, consisting of a negative lens and a positive lens of greater dispersive material and higher refractive index.

"2. The combination with the older forms of positive lenses of a negative compound lens consisting of a double-concave lens, and a lens of greater dispersive material and higher refractive index."

THE "AUTO" ACETYLENE GAS-GENERATOR.

The Scottish Acetylene Gas Co., Glasgow.

The chief advantages claimed for this, the latest form of apparatus for generating acetylene for photographic illumination purposes, are that the gas is cooled in the generator itself, and is therefore delivered into the gas-holder *quite dry* and ready for use; there is thus no trouble by the pipes choking with condensed moisture. There is ample storage capacity, and no gas is lost. The supply of gas is regulated to a *nicety* by the automatic regulator, exactly in proportion to the quantity of gas consumed. The supply of gas and light can be kept up continuously, as the generator can be recharged while the lights are burning. There is no danger, as the pressure in no part of the machine ever exceeds four inches of water. The method of using the Auto generator may be understood from the following directions:—

The generator is packed inside the gas-holder. Fix the generator on to the cocks on the bottom of the container by the screwed couplings, and see that the catch at the bottom of generator faces out. Place the gas-holder in the container and ship the guide rods into their sockets. The regulating rod must be pushed up through the eye on regulating lever and secured to the bracket on top of gas-holder by the nut. Fill the container with water till it is just level with the top of gas-holder when

quite down. Fill the water jacket. Fill seal can up to the inside with water. Shut all cocks. Place the charge of carbide, broken to about the size of a hazel nut, in the carbide box, and push it up into generator, securing it by a turn to the right. Lift up seal can and hook it on. Open the middle cock. Unhook the regulating lever and press it down. The machine will now make gas and regulate itself. When the charge of carbide is exhausted, the machine may be recharged as at first, taking care to shut the middle cock, and hook up the regulating lever. Should the machine be left set up at any time, hook up the lever till it is again wanted for use. To adjust the regulator, should the machine not be making gas fast enough, bend the spring on end of regulating lever inwards a little; if too much gas is being made, bend the spring outwards a little.



We have inspected the Auto generator, and it appears to us well adapted for projection and illuminating purposes in photography. The separation of the generator from the gas-holder, and the advantage of being able to recharge while the gas is being consumed are two of the strongest points in its favour. The Auto has been well thought out, is simple to use, and should be appreciated by those adopting the new illuminant.

THE LATE R. KENNETT.

One of the band of workers to whom modern gelatine dry-plate photography is so much indebted has passed away in the person of Mr. R. Kennett, who died on Friday, December 4, aged 79. For many years past Mr. Kennett had not taken any active part in photographic matters, and latterly had been in failing health, but at one time, through the medium of Kennett's pellicle and plates, his was a prominent personality in the photographic world.

It was in the year 1874, when the gelatino-bromide process was in the experimental stage, that Mr. Kennett, on June 9, read a paper before the London Photographic Society, in which he fully described his mode of preparing gelatino-bromide pellicle, from which we make the following abstract:—

"One pound of Nelson's gelatine is placed in a porcelain dish with one hundred ounces of distilled water, and after soaking for three hours is dissolved by heat. While still hot, eight and a quarter ounces of bromide of potassium are thoroughly incorporated with the gelatine, and afterwards eleven and a quarter ounces of silver nitrate (dissolved in a small quantity of water) are added and well mixed. Directions were then given for the subsequent treatment of the emulsion for the removal of the excess of bromide and the decomposition salts. This Mr. Kennett effected by pouring the emulsion into a dish to the depth of about a quarter of an inch, and, after allowing it to set, washing it in several changes of water or in a continuous stream. The emulsion was then ready to be redissolved and used at once for coating plates, if only a small quantity had been prepared. If, however, a large quantity had been made for stock, the emulsion was placed in dishes and evaporated to the consistency of thick paste, and, after being allowed to cool, the drying was completed on suitable frames. When dry, it could be cut up into convenient pieces for storage."

This latter operation was the portion of the process which formed the subject of Mr. Kennett's patent, now lapsed. There can be very little doubt that to Mr. Kennett's energy in thus bringing gelatino-bromide pellicle before the public in a practical and easily obtainable form, much of the subsequent success of the process was due; for, up to this period (1874), the number of those who had ventured into original research in this direction might be numbered easily upon the fingers.

Mr. Kennett leaves two sons and a widow, but it will, we are sure, be known with regret that the deceased gentleman did not die in affluent circumstances.

The Inquirer.

Action of Salt.—Cum Grano writes: "A friend of mine makes a practice of placing his negatives in a bath of common salt between development, and fixing for the purpose, as he says, of removing stain and preventing frilling. In fact, he claims that this bath plays the same part as alum without the disadvantages of the latter. Is this correct?"

Sulphite of Soda.—J. B. asks: "Is there any advantage in the use of sulphite of soda in the developer for collodion emulsion beyond that of preserving the pyro solutions? I have been told that it has an effect upon the colour of the image, but, so far as I can ascertain, such is not the case to any extent. Have the bisulphites or metabisulphite of potash any different action?"

Quicklime.—J. Hastings writes: "I have some quicklime that has been kept for two or three years in a stoppered bottle, and presents the appearance of powdery cubes that are easily crumbled to dust, whereas originally they were firm and hard. also, when moistened, they give off very little heat and undergo little or no change. Am I right in assuming that such a sample is useless for purposes where lime or its hydrate are required; as for instance, in rendering carbonate of soda caustic? I have great difficulty in obtaining small quantities of out-of-the-way chemicals, of which quicklime appears to be one. Is there any reliable way of keeping it in the 'quick' condition?"

News and Notes.

Vevers' Second-hand List.—Mr. C. C. Vevers, of 163, Briggate, Leeds, forwards us his price-list of second-hand photographic and lantern apparatus, shop-soiled stock, &c. It contains numerous bargains. Seekers after such should obtain the list.

Royal Photographic Society.—Photo-mechanical Meeting, Tuesday, December 15, at eight p.m., at 12, Hanover-square, W. *Some Probable Causes of Trouble in Photo-engraving*, with demonstration of methods for their detection, by Mr. Andrew Wybraodt-Penrose.

A correspondent writes: "It may interest you to learn that acetylene, or rather carbide of calcium, has been tried as an agricultural insecticide with alleged success. A vine-grower near Lerida, in Spain, has experimented with this substance against the *phylloxera*, which has proved such a scourge to wine-growing lands. He states that the vines so treated now show no signs of the pest, and are in a specially flourishing and healthy state."

Glasgow "Evening Times" Camera Club.—The winter Exhibition of this Club will be held in the rooms at 46, Gordon-street, Glasgow. The Exhibition will open on Monday, February 1, and remain open until Saturday, February 27, 1897. The Judges are Messrs. William Crooke, George Mason, and Francis H. Newbery. Communications respecting the Exhibition should be addressed to the Secretaries, *Evening Times* Camera Club, 46, Gordon-street, Glasgow.

"The Practical Photographer."—Commencing with its January issue, our contemporary will introduce several new features. A list of well-known contributors, pictorial and literary, is published, and it is proposed month by month to give examples of the various printing processes. "Peeps at Professional Photographers," "The Critic in the Studio and in the Field," "Lantern Lectures," and subject numbers, devoted mainly to special subjects, are among the new departures contemplated. By adopting this policy, the Editor hopes to clash with no existing publications.

South London Photographic Society.—The Eighth Annual Exhibition of this Society will be held at the Public Baths, Church-street, Camberwell, S.E., on Saturday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday, March 6, 8, 9, 10, 11, 12, and 13, 1897. The following are the Open Classes:—J, Pictures which have previously received an award; K, Pictures not previously medalled; L, Lantern slides which have previously received an award (sets of six); M, Lantern slides not previously medalled (sets of six); N, Photo-micrographs and other scientific subjects; O, Stereoscopic slides not previously medalled (sets of four). The Society's medals will also be awarded for the best trade exhibit, and for the most useful novelty in photographic apparatus. Entry forms and further information respecting the Exhibition can be obtained from Mr. Charles H. Oakden (Hon. Secretary), 30, Henslowe-road, East Dulwich, S.E.

An Acetylene Explosion.—A young man named Ernest Munro Field, eighteen years of age, son of Mr. A. Field, High-street, Olney, met with his death on Wednesday, December 2, under painful circumstances. The young man had always evinced a great interest in mechanics and engineering, and has of late been experimenting with the manufacture of acetylene gas in a generator of his own manufacture, to which a pipe and burner were attached. He attended a drawing class on Wednesday evening, returning home about 8.30. There was no one at home when he returned, his father and mother being at a meeting. It is supposed that on entering the house he immediately proceeded to the cellar where the generator was, and struck a match, an explosion following, which threw him to the ground and rendered him unconscious, and, no aid being at hand, he was suffocated by the gas. On the return of his parents, no notice was taken of his non-appearance, as he often sat up till late, either at home or with some friends in the pursuit of their hobbies. Mr. and Mrs. Field went to bed, but, as he did not hear his son return, Mr. Field arose about twelve o'clock and went round the house, when he was shocked by finding his son lying dead in the cellar. The doctor was at once sent for, but pronounced life extinct.

ROYAL INSTITUTION.—The following are the lecture arrangements before Easter:—Professor Silvanus P. Thompson, six lectures (adapted to a juvenile auditory) on *Light, Visible and Invisible;* Professor Augustus D. Waller, twelve lectures on *Animal Electricity;* Professor Henry A. Miers, three lectures on *Some Secrets of Crystals;* Dr. J. W. Gregory, three lectures on *The Problems of Arctic Geology;* Professor Percy Gardner, three lectures on *Greek History and Extant Monuments;* Professor W. Boyd Dawkins, three lectures on *The Relation of Geology to History;* Mr. Carl Armbruster, three lectures on *Neglected Italian and French Composers;* Mr. Walter Frewen Lord, three lectures on *The Growth of the Mediterranean Route to the East;* and the Right Hon. Lord Rayleigh, six lectures on *Electricity and Electrical Vibrations.* The Friday evening meeting will begin on January 22, when a discourse will be given by Professor Dewar. Succeeding discourses will probably be given by the Right Rev. the Lord Bishop of London, Professor Jagadis Chunder Bose, Professor John Milne, Dr. G. Johnstone Stoney, Lieut.-Colonel C. R. Conder, R.E., Mr. Shelford Bidwell, Professor Arthur Smithells, Sir Edward Maunde Thompson, Sir William Turner, Mr. Charles T. Heycock, the Right Hon. Lord Rayleigh, and other gentlemen.

EXAMINATION OF CATHODE AND RÖNTGEN X RAYS THROUGH COLOURED SCREENS BY THE FLUOROSCOPE.—Mr. J. Carbutt, the well-known plate maker of Wayne Junction, Philadelphia, sends us the following notes on this subject:—1. The cathode rays in an excited Crookes' tube, viewed through a pale yellow screen, show increased brightness of the yellow rays. 2. Viewed through a dark violet screen, the cathode rays present a phosphorescent glow, similar to that in a low-volt lamp when held in the field of an induction coil. 3. Viewed through a green screen, the cathode rays present to the eye a light emerald-green. 4. Viewed through a dark red screen, the cathode rays present a pale red on the carmine tint. The screens are of thin, polished plate glass, 1½ mm. thick, coated with gelatine, coloured with aniline dyes such as I use in making my photochromic screens. Examination of Röntgen rays through plain glass and the afore-mentioned screens shows that both cut off or absorb fully fifty per cent. of the Röntgen rays from reaching the screen of the fluoroscope. Screens of the following colours were placed side by side with the clear glass, viz., dark violet, green, light yellow, and dark red, and when in juxtaposition it was impossible to recognise which was clear glass and which was coloured, and the eye was unable to detect any colour sensation when looking through the fluoroscope with the coloured screens in close contact. These experiments confirm me in the opinion I have held from my first dealing with the Röntgen X rays, that they are of the ultra-violet, because I find they absorb the entire spectrum, while a deep violet screen absorbs all but the red. It was early determined by Professor Röntgen that the X rays could neither be deflected nor refracted, and I am not aware of any experiments having been made to determine the absorptive powers by the X rays of the colours of the spectrum.

KEEPING PROPERTIES OF NEGATIVE BROMIDE PAPER.—Colonel Waterhouse, in the *Journal of the Photographic Society of India*, says: "When going to Europe, in March, 1886, I took with me supplies of negative paper for use in a roll-holder, and in the dark slides. A few pieces of the latter were exposed a Aden, and developed some few weeks afterward at Venice, giving very good negatives. A fresh supply of the paper was received at Suez, and a large number of negatives were taken in Egypt on it, and the paper in rolls. At Venice also a large number of exposures were made on paper, and a few developed, which turned out quite well. Further exposures were made in Austria and Switzerland, but, as I had no time to develop them in England, I brought them all back to Calcutta in November, and began developing shortly afterwards. It was then found almost impossible to bring out the images on any of the papers even with strong developers; they all seemed very much under-exposed, and on some there were only traces of an image. Thus a large number of very interesting negatives were lost, though, fortunately, many of these latter in Egypt and Venice were more or less duplicates of glass negatives which were developed in Venice satisfactorily. There is no doubt that the keeping of the paper and the action of the air on both sides of the sensitive surface had destroyed the image. I believe that Colonel St. G. Gore, R.E., had a similar experience with paper negatives which had been kept for some time before being developed. The bromide negative paper was also tried in the Surveyor-General's Office for half-tone negatives, and successfully, but it was found that, in printing on ordinary albumenised paper, the negatives soon became very badly stained and useless. This could be easily avoided by the use of bromide paper, or any kind of printing paper prepared without an excess of silver nitrate or other salt likely to deliquesce and cause stains. At the same time, I do not recollect this staining being a marked feature of working with the old wax paper and calotype paper negatives, though my experiences with them were always in the dry climate of the N.W. Provinces and Central India. Paper is certainly very convenient and cheap in comparison with celluloid films or glass plates, and has its own advantages over both. If care be taken to develop soon after exposure, excellent results can be obtained, and if the emulsion be spread upon a suitable paper, and the negative properly waxed after finishing, the grain shows very little. Nevertheless, it would seem as if paper negatives must have some radical defect (no doubt the grain) which prevents them making their way in practice, and it is doubtful whether they will ever supersede celluloid or glass."

PHOTOGRAPHIC EXHIBITION AT AINTREE.—Since their first Annual Exhibition, three years ago, in the Walton Institute, the Aintree Photographic Society, like the district, has increased and developed remarkably. The new Aintree Institute has provided the members of the Society with most convenient headquarters, and the organization, under the direction of experienced gentlemen, promises to grow still further in popularity. The Third Annual Exhibition, opened last Friday, December 4, in the Institute, showed a wonderful advance on its predecessors from all points of view. There was a much bigger display of photographic work, and an admirable collection of paintings and specimens of brass work, wood-carving, embroidery, and other things comprised under the general head of home arts and industries. The total number of exhibits was between 600 and 700, being about three times more numerous than that of last year. The competition open to professional photographers was a feature of the Exhibition, and comprised specimens of the work of men of high reputation in the country. Indeed, the quality was of such a class that the Judges were impelled to award an extra silver medal. The open amateur classes also drew competitors from all over the country, and it is pleasing to note that the first-prize winner in one class is a member of the Aintree Society. The Exhibition was formally opened by Mr. Charles Dyall (Curator, Walker Art Gallery), who congratulated the Society upon their success, and referred particularly to the merit of the *repoussée* work and wood-carving specimens exhibited. During Friday evening a string orchestra from the Walton Musical Society gave a performance, and the prize lantern slides were displayed by the Lanternist (Mr. George A. Ashley). The honorary officials of the Society, particularly Mr. C. H. Adkins (President) and Mr. D. J. Neill (Secretary), deserve credit for the commendable manner in which the Exhibition has been arranged. The Judges in the Photographic Section were Messrs. T. F. Lloyd and F. Anyon, and their awards were as follows:—Six prints under half-plate (members): silver medal, William Lockier, Aintree; certificate, C. H. Adkins, Aintree. Six lantern slides (members): silver medal, William Lockier, Aintree; bronze, G. H. Jackson Walton; certificate, C. H. Adkins, Aintree. Landscapes, four prints (amateur): silver medal, Hugo Meynell, Cheadle; bronze, W. Smedley Aston, Birmingham; certificate, Llew. Morgan, M.D., Liverpool. Hand camera, six prints (amateurs): silver medal, C. F. Inston, Liverpool; bronze, J. Kearney, jun., Liverpool; certificate, E. E. Barron, London. Enlargements (two prints (amateurs): silver medal, W. Smedley Aston, Birmingham; bronze, E. Sinnett, Liverpool. Lantern slides (amateurs): silver medal, Edgar R. Bull, London; bronze, Harry Holt, Liverpool; certificate, William Harvey, Egremont. Figure studies and portraiture (professional): silver medal, G. Layfayette, Glasgow; extra silver medal, W. J. Anckorn, Arbroath; bronze, W. M. Harrison, Falmouth; certificate, W. H. Pugh, Liverpool.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

December.	Name of Society.	Subject.
14	Bradford	*The Composition of a Picture.* H. J. Dobson, R.S.W.
14	Ealing	*Development.* H. W. Peal.
14	North Middlesex	*Pictorial Photography.* Horsley Hinton.
14	Richmond	*Making a Lantern Slide.* C. H. Davis.
15	Birmingham Photo. Society	*The Intensification and Reduction of Negatives, with Practical Hints in the After-treatment of Negatives.* Thomas Bolas, F.C.S., F.I.C.
15	Brixton and Clapham	Lantern Evening.
15	Gospel Oak	Copying and Isochromatic Work.
15	Hackney	*Practical Pictorial Photography.* A. Horsley Hinton.
15	Isle of Thanet	*Development.* A. D. Sackett.
15	Leeds Photo. Society	*Lantern Slides.* Godfrey Bingley.
15	Lewisham	Lantern-slide Making.
15	Munster	Demonstration on Acetylene Gas. K. B. Williams.—Members' Lantern Slides.
15	Newcastle-on-Tyne	*Enlarged Negatives.* J. Brown and W. Thompson.
15	Royal Photographic Society	*Some Probable Causes of Trouble in Photo-engraving.* Andrew Wybrandt-Penrose.
16	Borough Polytechnic	*At Home Subjects.* W. Thomas, F.R.P.S.
16	Croydon Camera Club	Lantern Night.
16	Halifax Camera Club	Members' Lantern Evening.
16	Leeds Camera Club	*Collotype Printing.* W. J. Wilkinson.
16	Leytonstone	*Photography as Applied to Mediæval Architecture.* F. Clarke.
16	Photographic Club	*A Chat about Lenses.* T. R. Dallmeyer.
17	Darwen	*Lantern-slide Making and Toning.* S. Mitchell.
17	Leigh	Competition: City Scene.
17	Liverpool Amateur	*The Optical Lantern, and How to Use it.* P. H. Phillips and Walter Archer.
17	London and Provincial	T. Bedding.
17	Oldham	*How to Make a Dry Plate.* J. Hall.
17	Putney	*Enlarging by Artificial Light.* C. H. Davis.
17	West Surrey	Designs Competition decided.
17	Woodford	Travellers' Night. F. G. Emler.
18	Croydon Microscopical	Lantern Evening, Members' Slides.
18	Nottingham	*Intensification and Reduction of Negatives.* Thomas Bolas, F.C.S., F.I.C.
18	Oldham	Annual Dinner.
18	West London	Members' Lantern Night.
18	Wolverhampton	Prize Slides.
19	Ashton-under-Lyne	*Flower Photography at Home.* Samuel A. Platt.

ROYAL PHOTOGRAPHIC SOCIETY.

DECEMBER 8,—Ordinary Meeting,—Mr. John Spiller in the chair.

AFFILIATION.

The HON. SECRETARY announced that the Chiswick Camera Club and the Gainsborough District Camera Club had been admitted to affiliation.

RESIGNATION OF THE PRESIDENT AND HON. SECRETARY.

The CHAIRMAN announced that Captain W. de W. Abney, the President, and Mr. H. Chapman Jones, the Hon. Secretary, had tendered their resignations of their respective offices, and that the Council had, with regret, accepted the resignations. It was also stated that, in order to fill the

vacancies thus created, the Council had elected the Right Hon. the Earl of Crawford, K.T., as President of the Society, and Mr. F. P. Cembrano as Hon. Secretary, subject to those gentlemen consenting to act, and that Mr. Chapman Jones had been elected a member of the Council, in the place of the late Mr. William England.

A hearty vote of thanks was accorded to the retiring President and Hon. Secretary for their valuable services to the Society during their period of office.

Election of Auditors.

Mr. Leslie E. Clift and Mr. Peal were unanimously elected Auditors of the accounts of the Society for the current year.

Dr. Selle's Colour Photography.

The Hon. Secretary read a paper, adapted by Mr. R. B. Roxby from a communication by Dr. Neuhaus, on *Dr. Selle's Process of Photography in Natural Colours.* The paper commenced by summarising the methods of Becquerel and Lippmann, both of which were regarded by the author as unsatisfactory, the latter being said to bear the same relation to colour photography as the Daguerreotype bore to photography proper. A practical solution of the problem of photography in colours by direct means might not be an impossible ideal; but, for some time to come at any rate, indirect or positive processes must be looked to for a solution of the problem, and all endeavours in this direction had been founded on the Young-Helmholtz theory. Amongst the various abortive systems founded on this theory, the most notable was that of Ducos du Hauron, who, in 1878, prepared papers covered respectively with yellow, blue, and red sensitive gelatine, and, when such papers were exposed, the gelatine was rendered more or less insoluble, according to the greater or lesser degree of transparency of the negative, and, the soluble parts being washed out by water, the three "stencils" thus obtained were superposed and produced a picture in colours. This method, however was of no practical value, and the difficulties encountered led to the developments of Vogel, Ullrich, Albert, Joly, Macdonough, Anderson, &c., but neither of these systems could truly be called "photography in natural colours." Dr. Selle, like his predecessors—with the solitary exception of M. Lippmau—took his departure from the theory of Young-Helmholtz, and argued that an exact reproduction of any given object must be obtained if from a white surface, absorbing no light, there were extracted equal quantities of red, blue, and green in the manner in which the object *in naturâ* extracted them from daylight. Therefore, if impressions of a subject were taken by means of three plates, each sensitive to one of the three primary colours, three images would result, which when coloured with their complementary colours and superposed, would produce a picture in natural colours. Dr. Selle used a blue-violet, a green, and a red filter for taking the negatives, from which he made positives on chromated gelatine, each being developed in a bath containing a solution of a colour complementary to that represented by the negatives; the positives were superposed when dry, and a picture in colours was produced. The exposure for the negatives was under ten seconds, and it was hoped that within a few weeks it would be possible to give instantaneous exposures. The method had been very successfully applied to colour-printing, either by heliography, lithography, or letterpress, and excellent results in these directions had been obtained by Mr. Fcisch, a Berlin lithographer. Hypercritics might say that Dr. Selle's invention was not new; but, admitting that he had not discovered a new principle, that he had levied tribute on previous researches, and that he had profited by the experience of predecessors, Dr. Neuhaus thought it could not be denied that the process was in the main original, that what had hitherto been only a possibility had been turned into an accomplished fact, and that the problem had been solved in a manner so simple as to render colour photography as easy as ordinary photography.

Several specimens of work by Dr. Selle's method were shown, including lantern slides, positives on paper, and prints by three-colour photo-mechanical processes.

A very brief discussion followed the reading of the paper, a few remarks being made by Mr. H. Snowden Ward, Mr. W. E. Debenham, and Mr. J. J. Vesey, and

Mr. E. J. Wall remarked that the author of the paper had "muzzled" everybody by declaring that any one who differed from the views put forward in the paper must be hypercritical. So far as he could see, Dr. Selle had discovered nothing new; and, in some instances at least, he could not regard the colours of the specimens as in any way true to nature.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

December 3,—Mr. H. Snowden Ward in the chair.

Mr. R. Beckett showed some examples of an application of the collotype process to the photographic decoration of Christmas and other presentation cards, produced by his son, Mr. S. J. Beckett. He also passed round some plates coated with a backing made after Mr. Haddon's process. He described it as a backing that will dry and not become tacky, and spoke very highly of it.

Mr. Bayston showed the result of an attempt at making his own carbon tissue, with the idea of developing from the front. The paper was coated with a preparation of gelatine, some water-colour paint as pigment, and bichromate, and printed by gaslight. Development was effected from the front, yielding a very presentable picture.

Mr. W. J. Mackenzie exhibited and described a new acetylene gas generator, made by the Scottish Acetylene Gas Company, of Glasgow. It was constructed with the principal view of being able to recharge without the necessity of extinguishing the light; next with a provision for the purity of the gas from the first; and, thirdly, to supply a machine which would not become heated by use; and the apparatus, it was stated, fulfilled all these conditions. The generation of the gas was brought about by water being allowed to drip upon the carbide of calcium, an automatic connexion controlling the water supply and thereby the generation, according to the quantity in the reservoir.

A discussion ensued as to the relative proportions of acetylene and air, and other conditions requisite to cause an explosion.

Mr. E. J. Wall then addressed the meeting on

Colour Screens.

Mr. Wall commenced by throwing upon the screen a beam of white light from the lantern, which by means of a prism he split up into the spectrum. He proceeded to show the action of a number of coloured screens, or filters, upon this spectrum, taking first those of commerce. Having pointed out the range of the spectrum, he said the sensitiveness of an ordinary plate lay principally in the blue and violet, but by dyeing the plate or staining the bromide of silver with some chemical we can increase the sensitiveness of the bromide of silver to the less refrangible rays; but at the same time the sensitiveness of the silver salt to the blue and violet was so great, that it was necessary to use one of the numerous colour screens to get a proper rendering of the colours of which the object is composed. He placed the lightest tint of one of the commercial screens in the path of the rays, when the violet practically disappeared; the second tint exercised the same effect, but in a stronger degree; and the third, again, cut it out still more; while the darkest of all cut out more than any of the others. The next screen, a light one, cut out very little, but at the same time was used with very good effect. All these were of a yellow colour. The next screen, which was green, curtailed the spectrum at both ends. He mentioned a screen prepared with aurantia and collodion, which cuts down the violet fairly strongly, and was much recommended, and also passed round some made in a hurry from lantern plates, fixed and washed, and then dyed, of various grades of tint. For three-colour work he used filters of different depths, and showed the part played by these upon the spectrum. A red filter was shown to cut out the whole of the spectrum but the red; a green, to cut out the majority of the red and some of the violet and blue; and a violet, which should cut out green and yellow, leaving blue and violet unaffected, and a little of the red. The sole action, then, of these screens in this work was to cut out certain colours which were not required to act. The commercial yellow screens are probably made by taking glass and stirring it with a piece of wood. The glass in a liquid state dissolves or chars some of the wood, and probably some chemical compound of carbon was formed, resulting in a dark colour in the glass, which had no other effect than that of increasing the exposure, and, if one could get pure yellow, it was quite as effective as the ordinary commercial screen, and did not appreciably increase the exposure on the other hand. In orthochromatising a plate, the sensitiveness of the plate to yellow may be increased, leaving it normal to the blue and violet. There is a difficulty with green, which is that there are very few dyes which will sensitise for this colour. Yellow, orange, and red are not so difficult to manage, but for green there are but one or two suitable agents. He mentioned a series of negatives of varying exposures on orthochromatic plates, with and without a screen, which he had shown some time ago, and it was in the longer exposures only that the greens acted anything like properly, being represented very badly in the shorter ones. Screens were not difficult to prepare. He preferred collodion, with sufficient of the dye to make a saturated solution, or rather one that just fell short of the crystallising-out stage. It was very difficult to state exactly the proportions which would fulfil this condition, it depended greatly on the dye itself and the maker of the dye. Dyes varied considerably, and he had found many foreign substances in them which, no doubt, might have their use if the dye were used for what it was intended, but they were not wanted in screen-making. Brilliant yellow was good, and naphthol yellow was one he used for pale screens, which, however, had quite as much action as the deep orange ones. Orange in a screen was a mistake, as this colour cut out the green. With reference to green screens, if it were desired to photograph the red, a green screen was a mistake. It was very difficult to sensitise for red, and, if green were used, some of it was cut out, and things made worse than before; and therefore it was false that, by using green screens in connexion with orthochromatic plates, a correct colour rendering could be obtained. Ives recommends multiple yellow for colour screens, as it cuts out the ultra-violet, but he (Mr. Wall) had found that no yellow cut out the ultra-violet completely, and in his opinion it did not matter if one did have ultra-violet coming through the screen. With orthochromatic plates a very pale screen is advisable for ordinary work, and it will not greatly increase the exposure. When you come to special work, the depth of screen can be increased, and any effect obtained you want. In photographing flowers, it was very rarely necessary to use a screen. In the case of yellow and blue flowers, you would overcorrect; the blues would be made too dark and the yellows too light. With pictures, however, it was almost essential to use screens. A pastel required a lighter screen than a water colour, and this a lighter one than an oil colour, and with some of the old masters, where you get blue and deep browns (which are simply reds with a lot of black in them), a very deep screen indeed must be used. The best way to copy an oil painting was to use two screens—a very deep yellow, with which a fairly long exposure is given, and a lighter one to finish with. He would say that it was absurd to state that with a yellow screen and an ordinary plate one could get a correct colour rendering. Matters were made worse by using a yellow screen on an ordinary plate unless one were prepared to give an exposure which was practically out of the question.

Mr. Paul Martin asked if optically worked glass should be used for screens.

Mr. Wall replied that it all depended on the work to be done. For general landscape work, where diffusion of focus was an advantage, it did not matter, but there were cases where it was undesirable. Of course, the glass may not be parallel in its sides; and, again, curved glass would act as a lens. It was best to focus with the screen in position. In three-colour work, if the lens were imperfectly achromatised, the focus with the different colour screens would be quite at variance one with another. For landscape work the screen should be either behind the lens or between the combinations, but must not be placed in front.

Borough Polytechnic Photographic Society.—December 2, Mr. W. C. CORNFORD, the Hon. Secretary, read a paper on

PAPER NEGATIVES,

describing an almost new negative paper placed on the market by Messrs. Wellington & Ward, Elstree. In the course of his remarks he explained that the only difference between it and the ordinary dry plate was, that the gelatine film was supported on paper, in the place of glass, and that it was practically unbreakable, a very great advantage, thereby obviating the trouble and annoyance of broken negatives, that has perhaps been very difficult to procure. A great benefit is also gained by lightness as compared to glass. He also explained what a great advantage it was to carbon printers, as it can be printed from either side, thereby saving a double transfer; it is also far superior to glass negatives for enlarging, &c., as it can be affixed to the enlarging board much easier. There was also another advantage that proved it to be a long way ahead of glass plates, and that was that it was absolutely halation proof, and thus the trouble and inconvenience of backing plates was overcome. Mr. Cornford then went on to explain how it was possible to greatly improve faulty negatives by working with a pencil on the back of the paper. By this method it was by no means a difficult matter for even a novice to tone down those parts of a negative that have a tendency to print too quickly. The paper is only made in one speed at present, *i.e.*, rapid, and the best results are obtained by a full exposure and full development. Some specimen negatives and prints therefrom were then passed round for inspection, and, after ably answering a few questions that were put to him, Mr. Cornford distributed among the members samples of the paper which had been sent by Messrs. Wellington & Ward; and, judging from the favourable manner in which Mr. Cornford's remarks were received, negative papers should have a big future before it.

Brixton and Clapham Camera Club.—December 1, Mr. J. W. Coade in the chair.—A lecture on *Enlarging*, by Mr. J. A. Hodges, F.R.P.S., was read by Mr. F. W. LEVATT, and very well received, the after-discussion being also of an interesting nature. Sample packets of B. J. Edwards & Company's lantern plates were given to such members as promised to use them and show results at next meeting. Prints intended for members' quarterly competition must be to hand by the 15th inst. The subject is optional, but the work must be done on bromide paper, a bronze medal being given for the best results.

Croydon Camera Club.—December 2.—MR. FRIESE-GREENE, assisted by Professor Braham and Messrs. Johnston and Nichols, gave a series of demonstrations, accompanied by a display of apparatus invented by himself. Begining with animated photographs, he described and showed various models of cameras which he had successively invented, and similarly treated of the lantern apparatus used for projecting the moving image upon the screen. A striking point was made by displaying on the lantern screen two views of the Lord Mayor's Show. The first was projected from an ancient and primitive magic lantern over a hundred years old. The pictures or slides, which were hand drawn and coloured, and which were most quaint and curious, were, it was stated, about a hundred and fifty years old. Immediately after the above, a moving photographic presentment was, by means of a new lantern, thrown on to the screen, depicting the 1896 Lord Mayor's Show, with all the figures, &c., moving in a wonderfully lifelike manner. The waiting flunkeys, the soldiery and police, the seething and expectant crowd, all were there. Then was seen the Lord Mayor's coach approaching. It drew up, the flunkeys formed up in two lines, the mace-bearer and sword-bearer alight, and pass by; finally the Lord Mayor himself is beheld striding along in his weighty robes. At this point the prolonged applause testified to the audience's deep delight. The above, it should be said, was taken by Messrs. Wrench & Sons, following which was a captivating scene depicting Van Biene in *The Broken Melody*, by Esmé Collins. An Edison film, *Buffalo Bill*, was also put through. Perhaps the finest and most perfect effects were the sea views. The one showing rough waves breaking against a sea wall was singularly lifelike, flicker and false register being notably insignificant. *A Tub Race* (in the sea) was also technically good, and also had the further merit of causing roars of laughter. The lecturer proceeded to explain how, under the auspices of Sir George Newnes, he had brought to a high state of perfection machinery for setting up and photographing type, and for printing illustrations upon both sides of photo-sensitive paper at a high rate of speed and a low rate of cost. The sensitised paper could be produced, by the lecturer's method, at as low as threepence per pound, cabinet-size prints costing, for sensitised paper, twenty-four for one penny. Mr. Friese-Greene proceeded to print, develop, and fix, by means of a small model of his full-sized machine, a long band of bromide prints, with a picture upon each side. In response to a query of one of the members, Mr. Greene also printed a similar band of paper, using two negatives which Mr. G. W. Jenkine, a member of the Club, provided. Although Mr. Greene had never, until the moment of putting them into his machine, seen the above, he had no difficulty in running a long series of prints from Mr. Jenkins's negatives, probably of better technical quality than nineteen people out of twenty can get using the greatest individual care with each print. Mr. Friese-Greene next took up the Röntgen-ray subject. He began by intimating his intention of attempting a snap-shot, which he proceeded to accomplish, developing the plate before the audience, and passing it round, the exposure having been a fraction of a second. A shadowgraph of the President's hand was similarly developed and shown round, following which a considerable proportion of the company had their hands done, others meanwhile being indulged with a look at their bones, which were rendered visible to the eye by means of the vacuum tube and fluorescent screen.

Hackney Photographic Society.—December 5, the President (Mr. T. Bedding) in the chair.—On completion of the ordinary business, a lecture on

THE EVOLUTION OF THE GELATINE PROCESS

was given by Mr. A. MACKIE, in which, starting with an account of the labours of Nicéphore de Niépce and Daguerre, he detailed the work of the different experimenters from the early times to the present, and traced in detail the stages which ended in the modern gelatine process. Amongst those mentioned special importance was given to the following:—Niépce was the first to produce permanent photographs; Daguerre discovered development of iodide of silver with mercury vapour; the Rev. J. B. Reade discovered the use of gallic acid; Fox Talbot invented the calotype; Sir John Herschel introduced the use of glass; Niépce de St. Victor used albumen to hold the silver salts; Scott Archer brought out the wet-collodion process; Sayce and Bolton prepared a collodion emulsion; then followed gelatine and methods of ripening the emulsion. In concluding the lecture, and remarking on the fact that some of the earlier experimenters seemed often to have approached the discovery of facts which were yet not found out until years afterwards, Mr. Mackie said that, although one might at first be surprised at the non-success of the early workers in these instances, yet, when the imperfect materials and data with which they had to deal were fully taken into account, the wonder then was not at their having done so little, but of their achieving so much. The lecturer showed some fine examples of Daguerreotype portraits and calotype negatives and positives. Mr. R. BECKETT said that modern photographers owed a debt of gratitude to past workers, who had, in spite of great difficulties, laboured so well for the advancement of photography. Consider the benefits of being able to get one's plates ready-made; but, in the present race after rapidity, there was danger of losing sight of the advantages in the use of slow or landscape plates.

North Middlesex Photographic Society.—December 7, Mr. Mattocks in the chair.—Mr. H. STUART showed an ounce bottle of benzole, in which he had dissolved thirty grains of white wax. Shortly afterwards, on going to use it, he found a white crystalline precipitate, which occupied apparently more space than the wax originally put in, and he wanted to know the cause. No other reason than that the cold had caused it to precipitate was forthcoming. Mr. MacIntosh showed a quarter-plate changing box and dark slide to hold twelve plates in sheaths, which was admired for its simplicity. Mr. MATTOCKS asked how stale platinotype paper could be renovated. One member said that it had been recommended to dry it in an oven for some time; also a few drops of hypochlorite of lime in the developer helped to clear away fog. Mr. MACINTOSH suggested that monthly competitions for lantern slides should be introdnced in order to encourage that department of work in the Society. After a long discussion, he was asked to bring it before the Council for consideration.

Bath Photographic Society.—November 25, the President in the chair.—Dr. Coppinger and Mr. H. M. Scott were elected members of the Society. The CHAIRMAN said it was decided to hold the annual dinner on December 21, at Fortt's, tickets 7*s.* 6*d.* as last year, and the usual *Conversazione* in conjunction with the Literary and Philosophical Association had been fixed for New-year's Day. Colonel H. H. SEALY then gave his promised lecture on

SOUTH DEVON,

which was illustrated by upwards of forty slides, both negatives and transparencies having been made by Colonel Sealy during the past season. He contended that one of the chief charms of photography was the bringing back of reminiscences of scenes and places visited. Incidents were thus made lasting. South Devon offered much attraction to photographers. There are large towns and pretty villages, also moors adjacent, so that, if one failed in finding subjects, he must be hard to please. The route illustrated started at West Buckland near, Kingsbridge, with some quaint views; going thence to Bullth and Averton Gifford; views of and around Borough Island followed, and then Thurleston; and each view proved to be a theme for some interesting anecdote of the locality. In due course Plymouth and Torquay were dealt with, and, at the close of the lecture, the CHAIRMAN complimented the lecturer on the high quality of his photographs, and expressed the appreciation of the audience.

Cardiff Photographic Society.—The report and accounts for the year just ending were presented at the Eleventh Annual General Meeting of the Society on the 4th inst. The treasurer announced that the financial position was very sound. After matters of minor importance had been disposed of, the election of officers for next year was proceeded with. The President (Mr. S. W. Allen) was unanimously re-elected, although he expressed a strong desire to vacate the office. Mr. Faulkes, who has for so long undertaken the duties of Hon. Secretary, also asked to be allowed to retire, but the members succeeded in persuading him to retain the post. Mr. E. B. Howard, who had acted as Treasurer during the year, said, in reply to a proposal for his re-election, that he would be quite prevented from devoting the necessary time to the work. Mr. C. E. Hancock was elected to the post. The officers were heartily thanked for the assistance they had rendered to the Society during the year. The following were elected on the Council for next year:—Messrs. W. J. Jenkins, Kitchin, Harris, Booth, McCall, Dighton, McKinnon, J. J. Jenkins, and F. W. Kendall.

Leigh Photographic Society.—December 3.—The PRESIDENT (Mr. M. F. Burrows) read a paper on the

HAND CAMERA,

treating the different forms of cameras, shutters, plates, films, the advantages and disadvantages over the ordinary camera, and his experiences. A discussion followed, in which Messrs. Syms, Hampson, Wragg, and others took part. The best negative with print competition was decided in favour of Mr. Robert Leigh, for the first prize for a negative of Peel Castle, and Messrs. S. J. Green and P. Seddon tied for the second place.

Sheffield Photographic Society.—December 1.—The President (Mr. Tomlinson) occupied the chair. Two new members were elected. The medals gained in the recent annual competition were then presented to Messrs. Smith and Lygo, and the negatives from which the successful pictures were made handed round for inspection. An instructive and interesting paper on

PICTORIAL PHOTOGRAPHY,

prepared by Mr. A Horsley Hinton, was read by the PRESIDENT. Some of the author's Salon pictures were exhibited and greatly admired; and lantern slides were thrown on the screen, to show more clearly the author's meaning.

Wolverhampton Photographic Society.—December 1.—A lecture was delivered by Mr. T. H. Cox, entitled,

IN THE WILDS OF NORWAY,

illustrated by a large number of lantern slides of the towns, villages, rocks, and waterfalls of a portion of Norway recently visited by him. The lecturer described the various places visited, and the manners, dress, and customs of the people, speaking highly of their simplicity and kindly disposition as experienced by himself and others. He described their communal mills, which are maintained at the public expense, by the sides of the river torrents, for the free use of the people, and the enormous water power running to waste, which is now beginning to be utilised for electric lighting. Several striking slides were exhibited showing the peculiar dresses of the people, the female dresses embroidered with beads and their starched headgear, the interior and domestic arrangements of their houses. Some remarkable houses and churches were shown, the buildings being entirely of wood without nails.

Edinburgh Photographic Society.—December 2, Mr. F. P. Moffat in the chair.—Mr. J. C. OLIPHANT, M.A., read a paper on

LONG-FOCUS AND TELEPHOTO LENSES.

Mr. Oliphant advocated the use of lenses of longer focus, in proportion to the size of plate, than were generally used. Mountain scenery especially (it was pointed out and illustrated by several slides) lost a great deal of its grandeur if lenses of even the ordinary length of focus were used. In photographing buildings, too, the lecturer showed, long-focus lenses should always be used where practicable, as in this way the roofs, which are among the most characteristic features of a building, could be shown. A lens of eight or nine-inch focus for a quarter-plate was about right. Mr. Oliphant then went on to describe the telephoto lens. He considered that the results given by these lenses were, from an artistic point of view, unsatisfactory, although very interesting from a scientific point. Mr. Haddow then, on behalf of Mr. J. Lizars, exhibited and demonstrated the Vitagraph. The Exhibition was much enjoyed.

FORTHCOMING EXHIBITIONS.

1896.

December 29–Jan. 2. Borough Polytechnic Photographic Society. P. C. Cornford, 103, Borough-road, S.E.

Dec. 1896–Jan. 1897 Bristol International. Hon. Secretary, 20, Berkeley-square Clifton, Bristol.

1897.

January 14, 15 ..... Weymouth and District Camera Club. E. C. Bennett, 10, Newberry-terrace, Weymouth.

February 1–27 ..... Glasgow *Evening Times* Camera Club. The Secretaries, *Evening Times* Camera Club, 46, Gordon-street, Glasgow.

March 6–13 ..... South London Photographic Society. Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.

Patent News.

THE following applications for Patents were made between November 25 and December 2, 1896:—

MAGAZINE HAND CAMERA. — No. 26,551. "An Improved Photographic Magazine Hand Camera." W. BULLOCH.

CAMERAS.—No. 26,604. "Improvements in Photographic Cameras." Complete specification. P. K. STERN.

BURNISHING PHOTOGRAPHS.—No. 26,626. "Improvements in Burnishing Devices for Photographs." Communicated by G. Meyer & Co. W. P. THOMPSON.

STEREOSCOPIC PROJECTION.—No. 26,682. "An Improvement on the Action of Movements of Projectors, Stereoscopic Magic Lanterns," &c. V. DE L'ISGOY.

SCREEN KINETOSCOPY. — No. 26,765. "Improvements in Apparatus for Taking and Projecting Animated Photographic Views." Complete specification. A. LAPIPE.

PHOTOGRAPHIC APPARATUS.—No. 26,857. "Improvements in Photographic Apparatus." A. C. SMITH.

EMULSION.—No. 26,891. "A New or Improved Emulsion for Photographic Printing Purposes." A. HILL and THE CRESCO-FYLMA COMPANY, LIMITED.

CINEMATOGRAPHIC CAMERAS.—No. 27,007. "Improvements in Cinematographic cameras." J. W. HOLST.

CAMERAS.—No. 27,102. "Improvements in Photographic Cameras." A. C. JACKSON

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

SUGGESTED EXHIBITION OF PRETSCH'S WORK.

To the EDITORS.

GENTLEMEN,—I was rather interested in your remarks in last week's JOURNAL about Paul Pretsch's work, as I have some eight or nine specimens of it, given me by Pretsch in 1858, and, as far as I know, it would not be easy to show anything much superior to-day. The company you refer to had, if I remember rightly, several prominent photographers as leading men in it, and it was rumoured that it was never intended to succeed.

It would be of some interest if a small exhibition of Pretsch's work could be held, say, at the rooms of the Royal Photographic Society, where they could be carefully examined by process workers, and with them could be shown permanent reproductions done by other workers at his time; there were several then well known.

I think the method of steel facing of copper-plate engraving was either not known or practised at the period referred to, and without this the number of good impressions from a copper plate was very limited.—I am, yours, &c., FRANK HAES.

28, *Bassett-road, W., December* 7, 1896.

[We commend Mr. Haes' excellent suggestion to the attention of the Royal Photographic Society. EDS.]

THE PHOTOGRAPHIC SALON.

To the EDITORS.

GENTLEMEN,—I should have preferred not to continue the discussion of the peculiarities of the Salon management, but Mr. A. Horsley Hinton's reply to my last letter renders a short comment necessary. In his previous letter he alluded to certain statements of mine as "fabrications," and, although I have been able to quote Mr. Horsley Hinton's writings as my authority for these statements, he still considers that he was "*justified in referring to them as fabrications.*" After such an expression of opinion, of what value is any attempt to answer or refute his views?

In concluding this correspondence, I would call your attention to Mr. Horsley Hinton's change of position from that taken in his first letter. The first contention in his last contribution relative to the Salon prospectus is identical with the statement in my first letter to you (*vide* THE BRITISH JOURNAL OF PHOTOGRAPHY, November 6, 1896). His second and fifth, I have endeavoured to show, are practical impossibilities, for reasons already stated. His final remark, that any views I may have expressed would have no influence, and are of no importance to any one but myself, is rather inconsistent with the trouble that he has taken to combat them.—I am, yours, &c., HENRY W. BENNETT.

December 8, 1806.

[This correspondence here terminates.—EDS.]

PHOTOGRAPHERS AND COPYRIGHTS.

To the EDITORS.

GENTLEMEN,—My attention has been drawn to the article on the above subject by Mr. G. Watmough Webster, F.C.S., F.R.P.S., in your paper of yesterday's date.

Mr. Webster admits that he "has received many scores of copyright fees," and that, "in nearly all cases, editors treat photographers with the utmost courtesy, liberality, and honesty."

Now, let me ask Mr. Webster, who is a member of the Photographic Copyright Union, and which he seems to consider it his duty to slate so unmercifully, whether he would have received all these scores of nice little fees and sweet amenities from the press had the Union never existed?

No, sir. Were it not for the Union, Mr. Webster, in common with the rest of the photographic profession, would at this moment be looked down upon, defied, and have his work filched by the press, as was the case before the formation of the Union. Of course, it is easy to pick holes in, and hurl cheap contumely on, the best of institutions.—I am, yours, &c.,

A GRATEFUL MEMBER OF THE PHOTOGRAPHIC COPYRIGHT UNION.

December 5, 1896.

To the EDITORS.

GENTLEMEN,—I am directed by the Committee of the Photographic Copyright Union to reply to Mr. Webster's article, which appears in your issue of December 4, and to answer the various statements therein *seriatim*.

In reference to the case of the Autotype Company, the infringement referred to was that of a valuable picture, and was carried through by them before the Union was fully organized, and since this action the Autotype Company have become members. As to Mr. Whitlock's case, Mr. Webster has made several blunders. In the first place, it was not a case of Mr. Whitlock's, but of Messrs. Guggenhim & Whitlock, of Wolverhampton; secondly, they did not offer the case to the Union, nor are they members of the Union; and, thirdly, Mr. Whitlock, jun., personally assured the President that they just managed to escape a loss.

Mr. Webster makes a grievance that the Union transmitted to him the offer as received from the *Christian Herald*, and that they made no further suggestion that any larger sum should be obtained. Our answer to this is, that we always transmit to the Union's members the offers made, as a matter of routine, in the form in which they are received. Mr. Webster wired his dissatisfaction at this offer. The Solicitors of the Union pressed further, and, after considerable difficulty, got the *Christian Herald* to pay 10*l.* and costs. This offer the Committee recommended Mr. Webster to accept, and the reasons which induced them to come to this conclusion were: first, Mr. Webster had, in his letter to the *Christian Herald* dated November 10, 1894, given himself completely away by stating, "I shall be pleased to permit the use of *any* of my copyright photographs for the following fees . . . . one guinea and two guineas," which letter he never recalled; and, secondly, that the *Christian Herald* has been found by the Committee to be a straightforward firm, who honestly paid for subjects when used. Mr. Webster seems to think that, because he had signed the document authorising proceedings, he had no further discretion in the matter. Now, it must be clear that, before the Union takes up a case, they must have written authorisation from the members. However, in the course of proceedings, everything is submitted to the approbation and consent of the member before any decisive action is taken. With regard to Mr. Webster's insinuation that the London members only are the recipients of large compensations, and also his desire to get answers to Nos. 1 and 2 questions, we have to say that the business matters between the Union and its members are private, but we are willing, in confidence, to submit the whole transactions of the Union from its inception to Mr. Bedding, of THE BRITISH JOURNAL OF PHOTOGRAPHY, and another Editor of a photographic publication, in order that they may judge whether country members do not get full proportionate compensation for the use of the copyright publications which they produce.

As to Mr. Webster's allusion to the President's remarks at the general meeting of the Photographic Copyright Union, here, again, he blunders. He says that the President stated that seventy-five per cent. of the compensations was obtained for provincial members. What the President really did say [see THE BRITISH JOURNAL OF PHOTOGRAPHY, October 16, 1896] was: "Perhaps many here will be surprised to learn that at present four-fifths of the the business done by the Union is for provincial members."

We must remind photographers that the object of the Photographic Copyright Union is to obtain payment for all reproductions of photographers' copyrights, and to prevent infringements of their rights, and to help those of the profession who, through ignorance of the law or other causes, are unable to get just payment for the use of their productions, but not to claim or to obtain excessive or vindictive damages.

Mr. Webster has been careful to point out to your readers that the Union take twenty-five per cent. of the compensation recovered, but carefully omits to point out that, when the case fails in a court of law, the Union pays *half* the expense. Can any member find a soliciter who will undertake a case on such liberal terms? Certainly they do not feel justified in expending their funds upon any very doubtful or exorbitant claim, which they feel could never be recovered in Court.—I am, yours, &c., HENRY GOWER, *Secretary*.

GERMAN RECIPROCITY.

To the EDITORS.

GENTLEMEN,—Dr. Kaempfer, of Voigtlander & Sohn, recently borrowed a series of slides which were in my possession, and which he has shown before a few German photographic and Shakespearean societies. The doctor says that there is a strong wish amongst many of the best workers and societies for more direct touch with British workers, and suggests that, if any of the British societies would be interested in them, he will send over here a fine set of slides of English and Spanish architecture, which can be regarded as a good representative set of best German work. As Dr. Kaempfer will wish these slides to be returned to him within reasonable time, I have suggested that they should not be sent before the end of January, in order that such societies as might wish to see them may have a chance of making arrangements. I shall be glad if any secretaries who are interested in this matter will send me, as early as possible, lists of what dates they have available in February. —I am, yours, &c., H. SNOWDEN WARD.

6, *Farringdon-avenue, London, E.C., December* 5, 1896.

SCIENTIFIC INSTRUCTION AND THE PHOTOGRAPHIC PROFESSION.

To the EDITORS.

GENTLEMEN,—It is unfortunate that Mr. D. J. O'Neill, in challenging my remarks on polytechnics and photography, should be compelled to admit his ignorance of the technical and practical side of the "rules and mysteries" of photography. The convictions I expressed have been wrought out of a lifetime of bitter experiences of commercial competitive photography, a lengthy course of polytechnic instruction, and an acquaintance with numbers of photographic workers. Obviously, then, it cannot be expected that Mr. O'Neill should be in a position to weigh the truth or falsity of my opinions. Furthermore, as a photographer, I repudiate Mr. O'Neill's claim to formulate out of his inner consciousness what scientific instruction is or is not beneficial to photographers at large. His position approaches the ridiculous when his close connexion with a National Association of Professional Photographers is observed. Could anything illustrate more completely my original contention that there exists the idea that mere knowledge of photography is thought sufficient, not only to enable a man to produce good work, but, as in this case, to dictate a policy to the photographic world? This claim I do not admit, but, on the contrary, would draw a strict line between photographers and those who possess but a knowledge of photography.

Mr. O'Neill is no less unhappy in his reference to the Birmingham technical schools. According to the Committee: "The main object is to obtain students who are already occupied in work during the day, and, in order that this class may have precedence, registration is specially kept open for them three weeks at the beginning of each session."

Again: "The objects of the tuition is to give the students a knowledge of machinery and processes outside the work in which they may be engaged during the day."

Clearly, then, if these objects are carried out, they in no way conflict with my contention that polytechnic teaching should be practical, and confined to those actually engaged in the industry. If these are the main objects, what becomes of Mr. O'Neill's scientific principles? The practical object is also the most prominent in the Photo Process School, lately established by the London County Council. This being so, perhaps Mr. O'Neill will explain the value of a knowledge of the law of error and photography, logarithms, and exposure, or Lord Ryleigh on pinholes to the ordinary photographer. To begin with, it is said, that only Lord Rayleigh and one other man can understand his abstruse studies. Yet all such subjects come within the scope of the City and Guilds Examinations.

But such limitation in teaching remote scientific principles in no way implies that they are to be neglected, nor do I think that, in quoting Huxley as attaching extreme importance to the man of genius, I perverted his meaning. Huxley had a dread of over-education, and said we do not want "exhausted book-worms," but "shrewd, handy men." He also said: "I weigh my words when I say that if the nation could purchase a potential Watt, or Davy, or Faraday at the cost of 100,000*l.* down, he would be dirt cheap at the price." Again: "Now, the most important object of all educational schemes is to catch these exceptional people, and turn them to account for the good of society." We are to "catch," and even "buy," our men of genius. What, then, becomes of Mr. O'Neill's doctrine of "discovering himself?" My experience of the present system of science teaching is that it more often enables a good man to lose himself in some immense labyrinthine polytechnic, and to be never heard of or seen again. Several that I am aware of have already perished, and are buried in these gigantic buildings.

What is or what is not technical education was not my original inquiry, but the effect of polytechnic teaching upon the economic condition of photographers, my answer being that it had been injurious because, (1) it was too theoretical; (2) it had not been confined to *bonâ-fide* workers; (3) it had sought to displace workshop training by a class system. This economic question I consider the more important, and, if polytechnic teaching of scientific principles has proved so exceedingly beneficial, perhaps Mr. O'Neill will show how it has improved wages, profits, or prices.—I am, yours, &c., JOHN A. RANDALL.

42, *Tonsley-hill, East-hill, Wandsworth, S.W., December* 5, 1896.

THE GRAND KINEMATOGRAPH.

To the EDITORS.

GENTLEMEN,—In reply to the letter in your last, from Messrs. T. J. & G. H. Harrison, calling in question an announcement made by me at the Croydon Camera Club, on October 28, I can only say that our

members, Messrs. Victor Bender and Adolphe Langfier, have always referred to the grand kinematograph as an instrument originally conceived by them at the beginning of March, and since completed under their directions and at their cost.—I am, yours, &c.,

Croydon, December 5, 1896. HECTOR MACLEAN.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street. Covent Garden, London.*

H. R. HOLMAN; A. LEVY; PERPLEXED. In our next.

HERBERT W. LEWIS.—Please send us your address.

PHOTOGRAPHIC CLUB.—Report received too late for this week's issue.

NOTICE OF DISMISSAL.—NEMO. We believe you can claim a clear week's notice.

GELATINO-CHLORIDE PAPER.—C. WARDELL. If the prints are slumed before they are fixed, the slum should be thoroughly washed out before they are put into the hyposulphite bath—that is, if permanence be a consideration.

H. H. B.—We should say that the arrangement you propose would work well; the exposure would be comparatively long. If, however, you could use two lights, and employ a large white cardboard reflector, you would probably get a more even illumination.

COLLODIO-BROMIDE.—WM. MITCHELL. A bad example of halation. Collodiobromide plates should not be used without backing, even when making transparencies from negatives, if they have such strong contrasts as those from which the examples were produced.

PERMANENCE OF ALBUMEN PRINTS.—T. A. C. asks: "What is the life of an albumenised paper print?"—This is a query that it is impossible to answer. We have seen prints that have got into a woful plight in a few months, and we have seen others that have endured for thirty or forty years without apparent change.

REDUCING RESIDUES.—T. ERWIN writes: "Will you kindly inform me if I could use a metal pot for reducing silver ashes in? If I were using a crucible, how could I get the reduced silver out without breaking the crucible?" In reply: A metal pot will not do. The reduced silver can only be got out by breaking the crucible. This will be no loss, as they will only do for one operation. Crucibles cost only a few pence each.

LEAKY ROOF.—C. A. W. The roof may not have been made perfectly watertight by the builder, but that will not account for water dropping on to the furniture when it is not raining or wet outside. The trouble is from moisture in the studio, with the heat from the stove condensing on the cold glass and then dropping off. If the roof of the studio had a higher pitch, the condensed moisture would drain down the glass to the eaves, and cause no trouble.

GELATINE.—W. BLOTT. As you say, the term gelatine is very vague. There are scores of gelatines in the market, and no two of them are identical in character; but in Continental formulæ "gelatine" is too often treated as if it were a definite and constant article. However, we should recommend you to try one of medium hardness and solubility, such, for example, as Nelson's No. 1 Flake. If that prove too hard, mix with it some of the same maker's No. 2 Soluble.

COPYING FADED PRINTS.—G. R. says: "I have a photograph sent in to copy, a silver print in a very yellow and faded condition. Is there any means of restoring the picture a little for the time being for copying purposes?"—Not temporarily. If the print be immersed in a solution of bichloride of mercury, the yellowness will be removed, but no missing detail will be restored. However, yellow prints, as they are, often copy better than might be surmised, and very much better if plates orthochromatised with cosine be employed.

FACTORY ACTS.—F. E. G. asks: "Would you kindly inform me if I am liable to prosecution inasmuch as I employ five young women and three young men (ages from sixteen to twenty-one) from nine a.m. till six p.m., or, when pressed with work, from half-past eight a.m. till seven p.m. every day of the week, of course excluding Sundays?"—No; not if the conditions of the Factory Acts are complied with as regards meal times, work-rooms, &c. These you will get, in the form of an abstract of the Acts, from the Inspector of Factories for your district.

ALBUMEN TRANSPARENCIES.—MEW writes: "I shall be much obliged if you will say whether the beautiful albumen lantern slides of the French makers are printed by contact or whether by reduction in the camera, and if it is possible to reduce by this process from large-size negatives, supposing that the more usual method is to print by contact?"—Generally they are made by contact printing, but they can as well be made in the camera, and, of course, reduced from larger negatives. The albumen is a slow process, consequently camera printing requires a long exposure.

FERROUS OXALATE.—T. R. says: "When developing negatives with the above, is it necessary to use the clearing solution as for bromide prints, or wash in plain water before fixing? Also, should I use bisulphite of soda in fixing solution? I want soft negatives—copies of photographs?"—In reply: A clearing solution is not absolutely necessary. Better use plain hypo for fixing.

POSITION OF STOPS.—T. O'CONNELL says: "I have just had given me an old portrait lens, and the stops (two) are made to slide in the front, or hood, of the lens. Is this the best position for them, as with all the portrait lenses I have hitherto seen they have been fitted between the glasses? Is the position in this case due to something different in the construction of the lens from modern ones?"—No. In the oldest portrait lenses the stops were put in front; but that was not the best position, hence it was abandoned for the present arrangement—between the lenses.

THE LATE D. O. HILL.—F. GUTEKUNST says: "In the latest issue of THE BRITISH JOURNAL OF PHOTOGRAPHY favourable mention was made of the portraits exhibited by Mr. D. O. Hill at the recent Exhibition of the Camera Club of your city. Being desirous of communicating with the gentleman in reference to the same, we beg your indulgence in the request that you kindly furnish us with his address. By doing so at your earliest convenience you will greatly oblige."—In reply: D. O. Hill has been dead some years. The Royal Photographic Society, 12, Hanover-square, London, possess some examples of his work, we believe.

MEDALS.—H. S. C. says: "Can you give me information upon the ownership of medals obtained at photographic exhibitions? If my employer is the recipient of medals gained by exhibiting work executed solely by me in my capacity as operator, &c., is he entitled to those medals, whether gold or bronze, considering he has the honour of his name in conjunction with them? What is the usual arrangement between employers and employed under the circumstances, and are there any laws recognised by the exhibiting fraternity of photographic societies?"—In reply: The medals belong to your employer. Why should they not? Presumably you are paid for your work? We know of no "usual arrangement" between employers and employed on this subject.

DAMAGED WATER-COLOUR PICTURE.—W. H. W. says: "A friend of mine has a water-colour picture which he values very much. Some years ago he sent it to be mounted and framed. The man mounted the picture on a show-card or something of the kind, and now the printed matter is beginning to show through the water colour. Can you suggest a remedy for this? By show-card I mean that the card was covered all over with printing."—In reply: It is doubtful if there is any remedy if the printed matter has affected the colours. A restorer of paintings may, however, be able to unmount the picture and remove the stains, if they proceed from the greasy matter from the ink. As the work is valued, it should not be tampered with by amateurs.

A HARDSHIP.—HARD LINES writes: "In the spring I made a verbal agreement with —— & Co. for a year certain as assistant operator. Last week I received a week's notice, politely worded, that I should not be required any longer as business was always very bad in the winter, but they would be very pleased to take me on again in the spring, if I were disengaged, as they were perfectly satisfied with me and my work. Can I compel them to keep me on till the end of the time agreed upon, or make them pay me up till then, or, at least, give me some recompense? I am told that this is a usual custom with this house."—We fear our correspondent has no remedy, as the arrangement was only verbal. If the agreement had been in writing and properly stamped, the firm would have to hold to it, instead of behaving as they are.

ELECTRIC LIGHT FOR CINEMATOGRAPH.—PHOTOGEORGOS asks: "1. Would you kindly tell me how many cells, and of what kind of battery, I might work a cinematograph ordinary-sized film, up to, say, a yard long projection, sufficiently illuminated? 2. Also, approximate cost of working? 3. Prime cost? 4. Would there be risk of grave accident in case of misadventure in handling the wires? 5. Would ordinary porous unvarnished jars—such are easily made at any tile-yard—suit for inner jars or what would be cheapest and most effective class of battery?"—1. and 3. About forty cells of either Groves or Bunsen batteries will give a good light. Forty cells of the former (if our correspondent buys the parts and puts them together himself) of suitable size will cost from about 15*l.* to 20*l.* The latter from about half that sum. 2. If economically managed, two to three shillings per hour. 4. No. 5. Get the porous jars specially made for the purpose; they are very inexpensive. In our volume for 1879 is a series of articles on batteries, and their construction, &c., for electric light for photographic purposes; their prime cost, and cost in working.

SALE OF GOODWILL.—REMBRANDT writes: "I have recently bought a business at the above address, and, in the usual way, paid a certain sum for the 'goodwill.' Knowing at the time of purchase that the photographer had branches not far from here, I asked if his name, which I will call X, went with the business? He replied by letter, 'Yes, certainly.' Now, however, I find he has filled up the usual form directing that all letters addressed to X shall be sent on to him. I think this hardly fair, and have somereason to believe that it is an infringement of 'goodwill,' because, as you will perceive, orders for groups from the country, &c., would be sent on to him. I therefore am writing for your valuable opinion on the matter."—This, if the facts be as stated, seems to be a case of sharp practice, to say the least of it. But, whether our correspondent has any legal remedy, we cannot say, as all depends upon the conditions of purchase and the wording of the agreement. If that was properly drawn up or approved of by the purchaser's solicitor, a court of law will, doubtless, give redress.

*** Several answers to correspondents, &c., unavoidably held over.

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EX CATHEDRÂ.

The resignations of Captain Abney and Mr. Chapman Jones of their respective offices of President and Hon. Secretary of the Royal Photographic Society, which we announced last week, have doubtless provoked almost general surprise. Captain Abney was a member of Council and a Vice-President of the Society for many years, and had nearly completed a second term of office as President. Mr. Chapman Jones has held the responsible office of Hon. Secretary for a period of four or five years. Both gentlemen occupy scientific positions of high standing—Captain Abney's admitted eminence being far from solely dependent upon his photographic work—and their administrative abilities have been well demonstrated in the management of the Royal Photographic Society. On those grounds the resignation of two such men is to be deplored by all friends of the Society.

* * *

The reason for Captain Abney's and Mr. Chapman Jones's resignation lies in the fact that there is a desire on the part of many of the members to revise the rules relating to the election of the Council. With the object of assuring a constant stream of "new blood" into that body, it is sought to provide that at each annual election a certain number of the outgoing Councillors shall be ineligible for re-election until a year has passed. At present there is no restriction on what is called freedom of election. Captain Abney and Mr. Chapman Jones found themselves unable to agree to the proposed alteration, and therefore resigned.

* * *

That the grounds upon which Captain Abney and Mr. Chapman Jones took the grave step of throwing up their offices are slight and insufficient, will, it is probable, be generally admitted. Nevertheless, we, at any rate, were not at all astonished at, or unprepared for, their action. Writing on this very subject of the attempt to force "new blood" into the Council, we, on January 24 last (page 49), remarked: "There are many members of the Royal Photographic Society, who are of opinion that in very recent years the enormous amount of time which the Society has passed in discussing questions of internal policy has been, if not altogether unnecessary, at any rate largely in excess of the requirements of the case." We have good grounds for believing that Captain Abney and Mr. Chapman Jones were among those to whom we referred, and that, to put the matter plainly and in words that have been used in connexion with it, their resignations are, in part, a protest against "the constant tinkering of the rules" of the Society.

* * *

The Earl of Crawford has been elected President, and Mr. F. P. Cembrano Hon. Secretary of the Society. Two men better fitted for those posts could not have been chosen, and there need be no apprehension, if they consent to serve, that the Society will deviate from the path of prosperity it struck a few years ago. We hope that no time will be lost by the members in making such alterations in the rules of the Society as may be agreed on. The interest this Journal has long and consistently taken in the affairs of the Society, is our justification for the expression of a hope that the patience of very many of its members will be no longer tried by the idle and wasteful discussions upon trivialities of detail and procedure, which have been such unfortunate features of the

Society for many years past, and which it is high time were stopped, once and for all.

* * *

Mr. J. Craig Annan's collection of photographs now on view at the Camera Club, consists of about fifty works, which, with few exceptions, have been shown at the four exhibitions of the Photographic Salon. It is, therefore, not necessary for us to make detailed references to the exhibits, among which are such works as *S. R. Crockett, Esq.; A Utrecht Pastoral; A Lady in White; James Guthrie, Esq., R.S.A.; The Church or the World; Zandvoort Beach; Sibylla; Sisters; A Veronese Vineyard*, &c., with all of which the exhibition goer and the reader of illustrated photographic literature is familiar. It is hard to say whether Mr. Craig Annan excels in portraiture, in landscape, or in narrative work with the camera. He is, perhaps, the finest exponent of all three branches of photography that we have. There is a breadth, richness, and masterliness of conception and treatment about his one-man exhibition at the Camera Club that make it well worth visiting by all students of pictorial photography.

* * *

The Selle process of stained gelatine colour photography, which formed the subject of a paper at the Royal Photographic Society on December 8, is not new, and the claims made for it by the author cannot for a moment be allowed. It has frequently been described in these pages—so recently as October last, and before that about two years ago. Mr. F. E. Ives has worked the process, and has produced excellent results with it. Dr. Selle has taken a patent for the process in this country, which in all probability is valueless. There is room for surprise that a man having so much knowledge of what has been done in experimental photography as Dr. Neuhaus, should not also have known that the process he was describing was, figuratively speaking, as old as the hills. But why was the paper read at all? Papers to be brought before the Society are supposed to be submitted to the Council. Was that done in this case? It is not the first time that a meeting of the Royal Photographic Society has been utilised for the presentation of an unsuitable paper.

* * *

Our presence in Bristol last week recalled to us an incident that took place after our visit to the Exhibition there in 1893. By one of the routes to the station from Clifton Bridge, you get a very striking and comprehensive view of Bristol city, the Cathedral making a prominent object in the foreground. At the time we mention, we were shown a print that came from America, which bore a very mystical title. It depicted a large and apparently ancient town, and had a certain amount of atmospheric effect. We were asked to believe that this photograph had been taken in America—the continent of wonders—and that the city had no actual existence there, but was simply an aerial, reflected, or mirage-like image, which the photographer was fortunate enough to see and clever enough to photograph. The alleged cloud picture, however, was simply a copy of a well-known photograph of Bristol, by, if we remember rightly, Mr. W. Harvey Barton, that had been passed off by an American photographer as the photograph of a city in the clouds, and the circumstance of our being able to recognise it as a view of Bristol was the means of arresting the further spread of the imposture in this country.

THE SEPARATION OF THE LENSES IN STEREOSCOPIC WORK.

It is generally accepted that the separation of the lenses of a stereoscopic camera should be three inches. The purpose of stereoscopic photography is to reproduce, true to nature, the relief and solidity of objects; therefore it would seem essential that we should separate the lenses by a distance equal to that separating the eyes, and this varies in most people from two and a half to two and three-quarter inches. In children, the separation of the eyes is, of course, considerably less; till about the age of sixteen it becomes just over two inches, and in old people even increases to rather more than the normal.

If we assume that, from the centre of each eye, a single line is drawn till the lines meet, we shall find that we have a triangle with the distance of separation of the eyes as the base, and it will be easy to see how much we can see round an object placed within this triangle; that is to say, we can determine exactly how much more of the left side the left eye will see, and how much more of the right side the right eye will see. If we now increase the distance of separation, or, in other words, increase the base line, we shall find, keeping the distance of vision normal, that we shall see more on each side, and, therefore, we exaggerate the roundness of the object. This is what we do in increasing the distance of separation of our lenses in the camera. If we increase the base line of our triangle, or, in other words, shift our head some inches, using only one eye, and then shift it a like amount on the other side of a given point, using the other eye, we shall, in cases of small objects, actually be able to see right round them.

It is impossible, or, at least, not practicable, to alter the separation of the lenses to suit the separation of each individual worker's eyes, and, therefore, a mean separation of three inches has been chosen, which gives a slightly exaggerated relief, which, in practice, is not found disadvantageous.

When the eyes are directed to a distant object, practically infinity, it is obvious that the axes are practically parallel, but when directed to a near object, the axes are convergent. This has led many to assume that the axes of the camera lenses should be altered in precisely the same way, but the falsity of this reasoning at once becomes evident on applying it to a building. For, if we follow out the laws of perspective, we shall find that there will be two vanishing points, and, therefore, that the two images cannot be made to correctly coincide in the stereoscope. This was pointed out by Mr. W. I. Chadwick in a lecture before the Stereoscopic Club in Manchester seven or eight years ago, in which he shows by diagrams the falsity of this reasoning, for, as he points out, if we place the lenses with convergent axes, the left lens will see the parallel lines of the house converging to the right, and the right-hand lens will see the lines convergent to the left.

In choosing three inches as the distance of separation, there is one point which has been overlooked, and that is the position of the axes of the lenses as regards the centres of the plates. Assuming that the size of the stereoscopic plate most used to be $6\frac{1}{2} \times 4\frac{1}{4}$ inches, it is obvious that the centres of the two halves will be exactly three and a quarter inches, and therefore the axes will be in each case one-eighth of an inch out of the centre, a distance which, in such small plates, will, of course, be negligeable as regards the covering power of the lenses; but, assuming that we use a whole-plate, with its longer base horizontal, it is obvious that then the axes of the lenses will be five-eighths of an inch out of centre. With most of the modern lenses this is not of very great moment as regards

covering power, as most have sufficiently extended a field to cover a circle with a diameter considerably longer than the diagonal of the plate they are advertised for, and sharpness of definition may be obtained by stopping down; but there is yet another consideration which ought to be taken into account, and that is the difference in size of objects represented on the edges of the plates, which, whilst it may be neglected for pictorial purposes, cannot be neglected in scientific work.

Whilst for all stereoscopic work with plates of six and a half inches in length, we may determine on a separation of the lenses of three inches, for larger plates the axes of the lenses should be coincident with the centres of the plates.

There is one point in connexion with stereoscopic work which is frequently overlooked by young workers, and that is the distance of objects which should be included in the picture. It is well known that the smallest difference which can be detected by the human eye is a minute of arc, and if we draw a triangle with the normal separation of the eyes as the base line, and the angle at the apex as equal to a minute of arc, it is easy to calculate that all the points which lie beyond 240 yards may be considered as infinity, as the eyes will not be able to see them in relief. But when we come to consider the making of negatives, we shall find that this distance is considerably reduced. If we assume the greatest disc of confusion to be one two-hundred-and-fiftieth of an inch, we shall find that with a lens of two-inch focus, the depth of vision—for we know no better term to employ—will be only eighty feet; with a four-inch focus lens it will be 160 feet; with an eight-inch focus lens, 320 feet. It is therefore obvious that to choose subjects for stereoscopic work, which may be described as open landscapes or panoramas, is absurd, and even should these be chosen, unless near objects are included, the results will be more or less on one plane than standing in relief. It may, in fact, be taken as an axiom in stereoscopic work, that the nearest objects should never be more than thirty feet distant, and far better results will be obtained if this is reduced by one half or even more.

Beeswax in Solution.—At a recent meeting of one of the London photographic societies, a bottle of benzol was shown in which thirty grains per ounce of white wax had been dissolved, but which had shortly afterwards crystallised out. Thirty grains of pure beeswax are not soluble in an ounce of benzol. Indeed, the wax is not entirely soluble in that menstruum, as a portion remains undissolved. Why we allude to this subject is that, for photographic purposes, white wax should be avoided, as it is so frequently adulterated with such things as paraffin, spermaceti, &c. The best yellow wax, particularly if it can be procured from a farm where bees are kept, can generally be relied upon for its purity. That is more than can be said for the more expensive white wax.

Poisoning by Cyanide of Potassium.—An inquest was held one day last week on the body of a young fellow, an amateur photographer, who died from taking cyanide of potassium. The remarkable feature about the case was that, as no one saw the poison taken, it must have been swallowed some considerable time before any ill effects were seen, and then death was almost immediate. This the medical evidence accounted for by the supposition that the cyanide had been swallowed in the lump, and that it might have taken ten minutes or more to dissolve. This is the first time we remember the cyanide being taken in the solid form; it has always been swallowed in the solution, then the effect has been almost instantaneous in all instances.

Developments of X-ray Work.—The close interest with which this subject is watched is seen in the number of references made in the science periodicals of the day. The photo-physiological aspect is perhaps less in evidence than the electrical, which still is unillumined by any definite discovery as to the nature of the rays. There seems to be a remarkable power in the Röntgen rays of leaving behind some evidence of their previous presence when the illumination of the Crookes' tube has been discontinued. Gas passed through a long tube after being subjected to the action of the rays, possesses a certain electric power for some time after the tube is extinguished, and it is thought, for example, that evidence of photographic action after the cessation of the glow has been brought about by some peculiar condition induced in the air through which the rays have passed.

Uranium Radiation.—We have on a previous occasion referred to the investigation of this subject by some members of the French Academy, and lately, M. Becquerel has presented to the Academy a further paper. He finds that the rays emitted by uranium and its salts have some properties in common with the X rays; but while no one has been able yet to prove definitely that Röntgen rays can be either reflected or refracted like light, the uranium radiations do suffer reflection. Even when the uranium or its salts (which have previously been placed in the radiating state) have been kept in total darkness for eight months, the radiation remains unchanged. Further, gas which has been exposed to this radiation, possesses the same curious electrical property referred to in the previous paragraph.

Research Photography.—The Royal College of Physicians of Edinburgh have spent ten thousand pounds in building and equipping a Research Laboratory, which was opened last month. One of the four objects kept in view in equipping the premises was "to provide a photographic department for micro-photography," and this has been done in a very complete manner. To the right of the entrance is a large, well-lighted apartment, which will be used as the general office of the laboratory, and for the examination of specimens. Opening off this apartment are two photographic rooms, the outer of which contains the micro-photographic apparatus, and an arc lamp in a lantern, while the inner is the dark room. The new laboratory, like the old, is freely open to those who desire to undertake original investigations in the medical sciences, on their giving evidence of being able to undertake such work with a prospect of success.

The late Eclipse Expedition.—At the meeting of the Royal Astronomical Society at Burlington House, on Friday last, Mr. A. A. Common in the chair, Professor Stone and Sir G. Baden-Powell gave an account of the expedition to Novaya Zembla in the latter's yacht *Otaria*. This expedition, it will be remembered, was more favoured by the weather than was the one to Vadsö, and for which more elaborate preparations were made, though it was not all that could be desired at the most critical time. Still, some very good photographs of the several phenomena were secured. These were, of course, projected on the screen in illustration of the remarks of the speakers, and excited great interest. Sir G. Baden-Powell, in his remarks, said that the sum—1200*l.*—granted for observing such an important event as a solar eclipse was strangely inadequate. So it would be if, for a larger amount, suitable climatic conditions could be ensured.

British Art at the Brussels Exhibition.—A meeting, presided over by the Lord Mayor, was held at the Mansion House on Wednesday last week, to consider the steps to be taken to raise the necessary funds for securing a proper representation of British art at the forthcoming International Exhibition at Brussels. From four to five thousand pounds were thought necessary. Sir E. J. Poynter, President of the Royal Academy, said he had written to the Chancellor of the Exchequer asking the Government to contribute 1500*l.* The opinion was expressed that if the Government would contribute that sum no difficulty would be experienced in

aising the remainder. Since then Sir E. J. Poynter has been informed that the Chancellor of the Exchequer, Sir Michael Hicks-Beach, is able to comply with his suggestion, and the 1500*l.* will be granted. It is hoped now that British art will be able to hold its own in the Brussels show.

Leonardo da Vinci's Cartoon.—Five or six weeks back we mentioned that this famous work, in the Diploma Gallery at Burlington House, had been photographed by a foreign house. It is this reproduction that is now being issued to its members by the Burlington Fine Arts Club at a guinea and a half per copy. It may well be asked why so much of the most important work in art reproduction for this country is placed in the hands of Continental houses. It is often said the light is better on the Continent than here, but the light at Burlington House and the National Gallery is the same for a foreigner as for an Englishman; so it is at Buckingham Palace and Windsor Castle. It is said that the foreign houses work cheaper than English ones; that, as a rule, is not the case, as their prices are higher. In the case of the cartoon, the price charged for the photographing of it, we are told, was higher—very much higher—than that quoted on any English firm's price list, and so with the prints. In face of these facts, the most important reproduction work goes to foreigners. Why?

Artists and Railways.—Artists evidently don't like railways, or, at least, if they pass their way. When the new railway to Manchester was first projected, the artists in St. John's Wood were up in arms against it; but the railway is being made all the same. Now a new railway to Watford is mooted, and Professor Herkomer is protesting against its passing through Bushey, where he resides. To an interviewer, the other day, he modestly (so says the interviewer) said that his presence in Bushey means 10,000*l.* a year to the place. Moreover, that the railway would destroy the rural aspect of the place, and prevent young artists settling there. That may be so, but the railway, if decided upon, will come just the same; and, possibly, the inhabitants will find that it will prove more advantage, from a business point of view, than a colony of young artists. By the way, Watford and Bushey has become quite a colony of "process" workers and photo-engravers, and it is here that we believe Professor Herkomer works the process he exploited some time ago. Increased railway facilities would surely be a great advantage to them, as well as add to the prosperity of the neighbourhood. In this utilitarian age, art and artists do not weigh much against commercial progress.

Haze.—Since the exhibition of the deservedly medalled picture, *Misty Morning on the Wear*, the production of haze effects has been courted rather than shunned, as in former days; still, for the majority of photographic work (portrait or landscape) the advent of a misty state of the atmosphere is looked upon as a disaster. Hence a few notes on the conditions governing the probability of its occurrence will be useful. At a recent meeting of the Royal Meteorological Society, the Hon. F. A. Rollo Russell read a paper bearing on the subject, from which we may gather a few valuable hints. He points out that haze is most prevalent when the wind is from the north-east, and is probably due to excess of dust, brought about by conflicting currents. The causes of fog are, to a great extent, the same as the causes of haze, although here we have to take into account radiation under differing conditions of air and ground. With regard to the conditions of visibility of objects, they are most favourable with dryness of air near the ground level, uniformity of temperature and moisture, radiation below the mean, steady and homogeneous winds, through a great depth of the atmosphere, approximation of the temperature of sea and land, and a great number of dust particles less than the mean.

Avoidance of Vibration.—Some time ago we gave a description of an apparatus which might possibly be adapted for photo-micrography, devised by Professor W. H. Julius, with the object of suspending apparatus so as to ensure freedom from vibration. The form adopted has now been improved upon by him. It consists, as described in *Nature*, of three rods placed parallel to one another in triangular form, and coupled together at their extremities by two metal hoops. This framework is suspended by three metal wires, the latter extremities of which are fixed to it at three points near their middle parts, lying in a plane between two hoops referred to above; a third hoop is placed which can slide lengthways along the three rods. It is on this that the instrument to be free from vibration is placed. To bring the whole centre of gravity to a point in the plane of the three points of suspension, the framework is suspended horizontally temporarily by one of the wires; and the balance of the apparatus, with the instrument attached, is obtained by varying the position of the three weights placed near the end of the rods for that purpose. The adjustment of the special part of the instrument which must be freed from vibration is made by placing this as near as possible at the centre of gravity. To deaden any movements of the whole apparatus, three fan-shaped appendages are fixed to the hooks to which the wires are attached, and these are intended to be immersed in paraffin.

Chemists Fined.—Some amusing evidence was given at the Brentford Petty Sessions the other day, when two pharmaceutical chemists were each fined five pounds and costs under the Foods and Drugs Act, for selling "arsenical soap" that contained no arsenic. Part of the defence was that the soap did contain arsenic, and the maker of it said that two and a half grains were included in the composition of every three hundredweight of the soap. But this homœopathic proportion could not be detected by the county analyst. This witness added that there was no honey in honey soap, no elder in elder soap, no pears in Pears' soap, or cherries in cherry tooth paste, &c. But the Chairman of the Bench remarked that when the public is induced to pay sixpence for an article worth but a halfpenny believing it to contain arsenic, and that that is good for the complexion, they expect to get it. The magistrates decided that the soap was a drug, and that decision is to be appealed against. A few years ago, in the same district, several publicans were fined for selling sodawater that contained no soda, or not in the Pharmacopœia proportion, sodawater being ruled a "drug." However, magistrates in another suburban district decided that sodawater, as sold at public houses, was not a drug, and that people who drank it did not expect it to contain soda, and would not drink it if they did, and therefore they refused to convict. In the case of the "arsenical soap," it is pretty clear that it can be vended by oilmen and grocers so far as the Poisons Act is concerned.

BY THE WAY.

THE past month has not been particularly prolific in photographic matter, which is perhaps not to be wondered at, for the closing of the annual exhibition, or, perhaps I should say exhibitions, usually marks the commencement of the dead season for most things photographic, except those immediately connected with the lantern. Still there have been one or two topics stirring to keep up an indirect interest in camera work.

But, first of all, reverting to the closing of the exhibitions, the closing of the doors and the dispersion of the pictures does not appear to have blotted out all recollection of the rival shows, for we have been treated to a good deal of what looks remarkably like "washing dirty linen in public." It is an astonishing thing that, when in art matters a small clique detaches itself from its fellow and sets up a new "school," it should emphasise its superiority by so much patting of itself on the back and calling everybody else names. We have seen this sort of thing before in connexion with splits in and secessions from the various painters' societies, and now the supporters of the Salon appear to be desirous of establishing their artistic claims by following the lead of, shall I say, their betters?

It is too late in the day to reopen a discussion of "impressionism" (small "i," please) "naturalistic photography," or "fuzziness," whichever it may be termed, but it seems pretty evident by this time

that the chief exponents of the "new school" are not all Emersons, and that they know it. Indeed, even the best of them succeed principally by their selected exhibits. While it is quite possible that an out-of-focus photograph may be an artistic picture *in spite of* its technical defects, it does not by any means follow that a thoroughly bad one must rise to artistic heights *because of* those defects.

I have in my mind's eye, as I write, an instance of an individual, an amateur photographer, with no special leaning in any direction, who exhibited a picture and took a medal. It was not his first exhibit, but it was his first success; it was an outdoor figure study, the subject a very pretty girl naturally and gracefully posed—naturally, perhaps, because *self*-posed—and, while the figure itself was fairly or sufficiently sharp, the background, consisting of shapeless masses of foliage, was out of focus enough to hide its ugliness, and to be nothing more than "suggestive," whatever that may mean. Any how the *ensemble* was very pleasing and caught the Judges' eye. Unfortunately for the exhibitor, the impressionist critics praised it, and pointed out where its beauties and its virtues lay, with the result that he has persevered in perpetrating "fuzzytypes" for some three or four years now, without, however, so far, getting within touching distance of his second medal.

When we look at the vast number who have taken up the camera within the past few years, since it became possible to produce pictures without the trouble of learning the science of photography, we need not be surprised that a great many of them avowedly look with disdain upon what they are pleased to call the mechanical part of the work. But is there no "mechanical" part in painting or in any other form of art? Does the painter, who fails to master the elementary rules of perspective and drawing and the methods of laying his colours on canvas, get himself hung on the line by howling at technique? There was a time when the production of an artistic photograph, which was also technically excellent, was a far more difficult matter than at present, and when, indeed, any specially artistic quality was allowed to hide a multitude of sins of execution. Look at Rejlander's productions, and try and imagine what he would have done without present-day facilities! But now there is not the faintest excuse for "sloppy" work, and technical excellence, both in definition and gradation of tone, should be as important an item in the qualifications of a photograph as of a painting.

I am sorry to say it is not only the new men in photography who openly flout at the scientific side. Not long ago, so high an authority as Mr. H. P. Robinson was mildly sarcastic on the subject of formulæ. Now "H. P. R." has done marvellously good work in the old days, when I presume he had to study formulæ; at any rate, he did what was the fashion in those days, he went through the drudgery and mastered *photography* before he attempted art, and I do not recollect ever to have seen a production of his that was not at least as perfect in technique as in other qualities. The modern man attempts art, but gives up photography as too difficult a task. In times past even great painters were not above descending to such mechanical tasks as grinding their own colours and preparing their own canvases, and would do so again if such firms as Winsor & Newton, Rowney, and others, dropped out of existence; but, if our plate-makers shut up shop in a body, "impressionism" and half-modern photography would die with them. Focussing glasses and guides to development are quite as cheap as plates, and much more useful in turning out *pictures*.

There was a very suggestive leader a few weeks back on the *Future of Photography*, though I think the title should have been rather the "Future of Exhibitions," for fortunately the future of photography is not dependent on the question of focussing. What is photography? Surely picture-making, whether good or bad, does not constitute the beginning and end of it? My own impression is that the technical side is the real photography, while mere picture-making is but a side show. We should not be satisfied at an electric exhibition to find it confined to, say, telegraphy. At the same time a purely technical exhibition would appeal only to a comparatively small section of even photographers themselves, and to the general public not at all, and, I fear, a separate exhibition devoted only to the purely scientific and mechanical sides, even though modern printing processes were thrown in, would prove as serious a "frost" as the unfortunate show at the Imperial Institute last year. Then, again, to have a fairly representative show of modern technical processes and apparatus would require far more room than has hitherto been at the disposal of the parent society, and it is questionable whether the additional attraction would be great enough to repay the extra expense involved, so that, all things considered, the combined show would appear to be the preferable plan.

There is no reason why such a mixed exhibition, even on a small scale, should not be extremely interesting, but it would have to be on entirely different lines to former years. The apparatus department at Pall Mall has always been a farce and a disgrace. Any one can show anything, and the specimens of incomprehensible rubbish that sometimes find their way on to the table would be hard to beat at any other exhibition I ever saw. If only really novelties were admitted, and these subjected to a rigorous examination before acceptance, a good deal of useful matter might be got into the small space, and let the same system of weeding out be applied to the pictures. Then each exhibition might make a speciality of some particular branch or department of scientific photography, orthochromatics, colour photography, half-tone process, photogravure, &c., including processes, appliances, and materials, and, if necessary, demonstrations. These need not interfere with the general or "artistic" public, while they would prove sufficiently attractive to a large section of technical workers, who would not trouble to go to see the pictures alone, to say nothing of a perhaps not insignificant number of those whose interest in photography extends beyond the capture of medals.

One of the disputed questions of the day seems to be the safety or otherwise of acetylene. Either side can be taken according to the point of view of the observer. Thus let us take it that it is safe—"as safe as ordinary gas," as one writer says. So in the abstract it is, when all is right and you know perfectly well what you are doing. But it has to be borne in mind that acetylene gas is "made on the premises," while ordinary gas is manufactured by experts in properly constructed works, and "laid on" or supplied in a comparatively harmless form to the consumer. What would be the probable state of affairs if ordinary gas were made in the kitchen fireplace and carried about the house in a portable gasometer? Oxygen, again, is perfectly safe under proper conditions, yet how many fatal accidents have occurred in the manufacture and use of that gas.

As I say, acetylene may be perfectly safe and harmless under proper conditions, and when the generating apparatus is thoroughly understood and in perfect order. But no earthly power can guarantee that the apparatus will always keep in order, any more than that an oxygen retort or a gas cylinder will not sometimes explode with disastrous results. It is not the acetylene alone that is dangerous; it seems to me that the calcium carbide is most to be feared, and if any hitch occur in the working of the generator, and the gas goes on accumulating under constantly increasing pressure, what is one to do but wait the inevitable? It is all very well to say, as Mr. John Watson does, "Do not experiment yourselves, follow out the simple instructions given for your benefit." Simple instructions cannot prevent accidents, and the sequence of the same sentence seems to point very distinctly in the direction of danger, for it seems these "instructions" have been arrived at "the cost of the brave men who have risked and sacrificed their lives for the benefit of science." Doesn't it seem just possible that, if experienced men come to grief occasionally, outsiders may stand a chance of doing the same?

I was rather interested in an article on *Cycling and Photography*, but I cannot quite understand some of the conclusions of the writer. I fully agree with him that the "three-wheeler" is out-and-out the best machine, both for convenience, safety, and comfort, for the travelling photographer, but why he places the safety bicycle last I utterly fail to see. True, he says if any of the weight is hung on the machine, it will affect the steering; but why not carry it, except

the stand, on the back? He places the "ordinary" bicycle next to the tricycle; now, an old friend of mine over twenty years ago thought very little of mounting his 56-inch "spider" with his whole-plate "kit" on back, knapsack fashion, and stand strapped to the handle bar, and doing a day's spin out and home of sixty or seventy, and on one occasion eighty-four, miles. Now, if that were possible on a 56-inch wheel, how much easier it must be on a 23 or 30-inch "safety." I am acquainted with more than one cyclist-photographer who utilises the "safety" in this manner—camera and plates on back, and stand on handle or backbone, whichever may be most convenient; or, with a fourfold stand, it also can go on the back. But personally I am getting old enough to yearn for something safer even than the "safety," and so prefer the three-wheeler.

DOGBERRY.

PHOTOGRAPHERS' COPYRIGHTS.

THERE are two letters replying to my article on this topic. I will deal with the "Grateful Member" first. He says I have "unmercifully slated" the Photographers' Copyright Union, and suggests that I have "hurled cheap contumely" on them. Save us from our friends! I have simply given a brief abstract of the facts of my connexion with the Union touching a recent incident, as they declined to permit the correspondence itself to be published. "Grateful Member" clearly shows by these descriptive words how he thinks the facts tell against the Union, for I made no comments. He asks, further, whether I would have received these scores of fees, &c., had it not been for the Union. I did receive many of such fees and annuities before ever the Union took a case into court. The Secretary to the Union furnishes a still better reply. Writing of the Autotype Company, who received exemplary damages for a piracy in a few days after legal application to the pirate, without any assistance from the Union, he says the Autotype Company "carried their case through before the Union was thoroughly organized." In the recent case of a barefaced piracy of a very valuable copyright picture belonging to me, the Union obtained the ridiculous compensation of ten guineas and costs "after considerable difficulty."

I will now deal with the Secretary's communication. I accept his correction about the Whitlock case, which I only gave on hearsay, as I stated; the Union will no doubt be pleased to have the opportunity of preventing my informant having any excuse for repeating the tale. The "seventy-five per cent." I wrote was a clerical error for eighty, but in favour of the Union. Under the excuse of privacy, he declines to reply to various very pertinent queries I put. Readers will no doubt draw their own conclusions. It must be remembered that it was not I who suggested that the Union existed for the benefit of a London clique. The President mentioned the rumour. "Qui s'excuse s'accuse," the French say. Speaking for the Union, the Secretary quotes a letter written in 1894, giving prices to the *Christian Herald* for a *special set* of portraits (*that had already been published* elsewhere), inferentially suggesting that such terms must necessarily hold good for all future copyrights of *any* subject. This is a fair example of the way the provincial photographer's interests are looked after by the Union. I content myself again with drawing attention to their methods. Comment would be superfluous.

I now come to a very grave matter, in which the honour of the Union is compromised by their officials. The Secretary writes as follows:—

"Mr. Webster had, in his letter to the *Christian Herald*, dated November 10, 1894, given himself completely away by stating, 'I shall be pleased to permit the use of *any* of my copyright photographs for the following fees . . . . one guinea and two guineas.'"

This statement of the Secretary is inaccurate. I append an exact copy of a transcript, in his own handwriting, of my letter to the *Christian Herald* (omitting names), the letter *being a reply to one of theirs*:—

"*Studio*, 33, *Bridge-street-row, Chester*,
"*November* 10, 1894.

"The Manager of the *Christian Herald*.

"DEAR SIR,—In reply to your letter, I shall be pleased to permit the use of any of my copyright photographs for the following fees, viz.:—Cabinets: Lady ——, one guinea; H.S.H. Prince ——, one guinea; both together, one and a half guineas. Panels: Lady ——, two guineas; Prince ——, two guineas. For one issue of your periodical my name to appear under the picture as photographer and owner of the copyright.

"Yours faithfully,
"(Signed.) G. WATMOUGH WEBSTER.

"Per L. Cuzner, *Secretary*."

It will be observed that there is no italicising of the word "*any*," as Mr. Gower makes it; and further, that my letter quoted prices for five distinctly specified pictures, and not, as Mr. Gower puts it, for "*any*" pictures.

G. WATMOUGH WEBSTER, F.C.S., F.R.P.S.

THE PASSING OF THE PORTRAITIST.

IT seems probable that in the immediate future, the photographic world will be involved in a controversy similar in character to that which divides certain politicians—the members in one division being known to their opponents as "Little Englanders." The controversy is already in the air, recent events tending to precipitate it in a definite form. The issue, put plainly, resolves itself into two possible courses; on the one hand, shall photography be defined by this or that limited acceptance of the word? or shall it be broadly interpreted to include the whole body of persons in any way connected with photographic processes? In short, are photographers to adopt a policy of contraction or expansion?

This is not altogether a modern dispute, though it has recently entered upon a fresh phase through the introduction of new elements. In the past the conflict was between science and art. To many photographers, science should only be introduced into photography to perfect and extend its methods the better to produce artistic work; to the men of science, art photography has been merely the appropriation to commercial ends of what should be rightly a branch of pure science. For many years the art photographer—who in practice means the portraitist—has held the field, being both in number and influence the predominant power. Thus the ethics and ideals of the portraitist have generally prevailed, these being modelled upon the customs and traditions of modern and bygone schools of art. The photographer was to be primarily an artist, producing works of art, having for his guides and masters men of the stamp of Rejlander, Adam Salomon, and H. P. Robinson; persons who did not work in this spirit, and with the same high ideals before them as these masters held in their day, had no claim to the name of photographer. The only photography was the pictorial photography.

But whilst the majority of photographers have been holding these opinions, and reducing them to practice according to individual ability, events have been rapidly progressing around them, they, meanwhile, remaining intellectually at a standstill. The portraitist, clinging to his artistic ideal, has been left stranded, and out of touch with the more recent advances of commercial photography. Ten years ago the artistic view of photography was the prevalent one, being applicable to the then existing body of photographers; since then an entirely new class of man has arisen, to whom the former ideals and artistic aspirations are unintelligible, because having no direct application to his work. This class the portraitist ignores, keeping strictly apart from its ways of business, and scarcely recognising its photographic character. The older societies and institutions take little notice of the dry-plate maker, the trade printer, the bromide enlarger, the lanternist, the view publisher, the provider of photographs for advertisements, Christmas cards, &c., the process operator, the process-block maker, the manufacturers of photographic materials, the more recent additions—the X-ray operator, the kinetographist, the three-colour process workers, and many others in minor branches of photographic work. The ideals of the portraitist cannot be applied to workers of this description, yet this class is rapidly growing, and perhaps even now equals in wealth, and will certainly soon outnumber, the artistic photographers. They will not be much longer pushed aside and ignored; but if the art ideals are to prevail, they must be classed as rude mechanics along with Abney, Bothamley, Pringle, and Co., as having no valid claim to the title of photographers. Should such an attitude of antagonism be persisted in, we shall have the spectacle of a comparatively small body of men taking up a position of lofty isolation, and alienating the more powerful and wealthier section of their own industry.

In place, therefore, of the old opposition between science and art, we have now this large and growing commercial class to consider. Meanwhile, the ascendency of the portraitist is also threatened by the increasing applications of photography to his old enemy science. Scientific men are using photography more than of old. It has almost displaced eye observations in astronomical observatories, hardly a science can be named to which it has not been applied, and it crops up in such unexpected places as the engineer's shop for gauging the dimensions of screw threads. The total commercial value of the scientific trade must now be considerable, large numbers of photographic workers gaining a livelihood in supplying the demand. Furthermore, it must be recognised that commercial and scientific photography will continue to advance by reason of new applications and discoveries, whereas portraiture has reached its maximum, and cannot now extend only in so far as wealth and population increase. With scientific and commercial photography, none can tell to what importance they may eventually reach, and it would be well not to undervalue their possibilities.

Besides these external causes which threaten the supremacy of portrait photography, there is an internal disruption, which seems destined to separate the portrait and landscape photographer, who, until recently, were regarded as one. Dr. Emerson showed what artistic work could be done in nature photography, pure and simple. His followers, upholding an even more transcendental view of nature photography, have created a

school of landscape photographers more ambitious, more cultured, though less confident of their powers, than the older workers. The portraitist called himself an artist, and claimed to be a photographer; the new man calls himself a photographer, and claims to be an artist. Not that he would identify himself with the scientific or commercial worker, but with the aim of lifting photography to art instead of bringing art down to photography. The outcome of the activities of this new school has been to limit the sphere of the portraitist, for it has raised in some degree the standard of quality of photographic views. A view must now have a pictorial beauty; more attention is required in its production, and considerable ability must be displayed if it is to be a marketable commodity.

In every direction we see growth, it being evident that in the near future, portraiture will no longer be the leading interest in photography. In absolute amount of work required there will, of course, be no decline, the change being merely one of relative importance. It is hardly possible, at this late date, for portraiture to die out. In the future it will, therefore, be unreasonable to confine the meaning of photography to its artistic aspect, and to call its exponents representative. The only alternative is that the art photographer return to the older position, and designate himself an artist without the photographer. Some such distinctive title will have to be adopted by those who adhere to the strictly artistic side of photography, if they have any fear of lowering their art status by association with the commercial reproducers and scientific workers. They might also follow the custom of painters in using the descriptive names, "artist in oils," "artist in water colours," black-and-white "artists;" in agreement with such nomenclature we should have the terms "artist in platinum," "artist in carbon," &c.. In the event of such departure, the name photographer would remain with the larger and more wealthy body about whose right to be called artists no quarrel would arise. Such a separation is, however, not desirable, the well-being of photography would be more certainly assured by a strong combination of all sections for educational and trade purposes.

The inclination to regard photography from a single point of view was evident at the last Pall Mall Exhibition, as this JOURNAL has already pointed out. An exhibition is in no way representative of an industry whilst it overlooks the more progressive sections; an exhibition being simply a means of marking progress. If the photographic profession is to prosper in the future, its commercial interests must be studied in the present, and likewise the interests of those workers who are extending its scope, and putting capital into the newer departments.

The policy of limitation has done some harm in the past, photographers having clung too long to the belief that artistic portraiture is the only legitimate and profitable application of photography. How far this opinion has stood in the way of the commercial prosperity of photographers as a body I shall not pause to inquire: one thing, however, is certain, the artistic ideal has not prevented the growth of a purely utilitarian photography. Had a more liberal view been taken of the profession in the past, we might now see the photographer engaging the process worker instead of the process worker engaging the photographic operator. Process work would then have been rightly regarded as a branch of photography, and not, as now, a branch of printing. The evolution of the process worker is not yet complete; with the cheapening of production there will be every inducement for him to supply ink portraits of large size to private individuals, and thus enter into direct competition with photographers. This would mean a loss not easily recovered.

From whatever side the question is looked at, it appears that the portraitist can no longer be regarded as the ruler of the photographic world; it only remains for him to decide whether he shall throw in his lot with the numerous other workers, or form a small clique having artistic aims and no pronounced commercial policy. To me it seems certain that in future photographic processes will come into use for the greater part of black-and-white illustration, and that three-colour photographic work will supplant much of the cheap colour work which is now done. Direct negatives will also be much in demand, this of necessity meaning the want of men who can produce artistic work with the camera. In such work the very best of artistic photographers will find employment, and so identify their interests with the most prosperous section of photography. Even now some of the leading portraitists are extending business in this direction, producing art studies and composition pictures fit for mechanical reproduction. By turning his attention to similar work, the portraitist might extend his business, and come within the scope of progressive photography. If this is not done, a class is sure to arise who will make a speciality of the work and render competition hopeless.

Those who reject these minor branches, and hope to depend solely on portraiture, will be compelled by circumstances to form themselves into a strong combination to prevent the overcrowding and severe competition which otherwise they must encounter.

JOHN A. RANDALL.

A DRUGGIST'S DILEMMA.

WHILE every one recognises that it is necessary for the safety of the public that there should be some restrictions on the sale of poisons, there are many who consider that the present state of the law of the subject is unsatisfactory. Under the present law, a class is given the monopoly of selling certain scheduled poisons, and even in their case there are formalities to be gone through, otherwise the sale becomes a punishable offence.

The Pharmaceutical Society is at present entrusted with the power of putting the law in motion against offenders, and it has been imputed to them that they have exercised their power, not with the common sense that should be exercised with regard to all laws, but sometimes rather as an instrument of persecution; not as a trust to secure the people against harm, but as the defence of a monopoly.

It has been contended that the Pharmaceutical Society is bound to prosecute in every case of infringement of the Poisons Act, and they cannot be charged with remissness when any unregistered seller is concerned, even though the poisonous material be in so small a quantity and in so diluted a state as to cease practically to be poisonous. *De minimis non curet lex* seems to be a maxim unknown to the Society, and if an unfortunate complexion specialist must be prosecuted for selling a lotion containing an almost inappreciable quantity of bichloride of mercury, what ought to be done to a registered chemist for a similar offence? What is sauce for the goose is sauce for the gander.

In connexion with the discussion of the administration of the Poisons Act which has recently taken place in THE BRITISH JOURNAL OF PHOTOGRAPHY, the following report, which is taken from the *Weekly Sun* of the 13th inst., will be interesting.

"ARSENICAL SOAP.

"A PECULIAR PROSECUTION AND AN INGENIOUS DEFENCE.

"At the Brentford Police Court yesterday, before Mr. G. G. Mackintosh (in the chair) and other magistrates, a remarkable charge under the Food and Drugs Act came on for hearing. The defendant, Mr. George Turner, a chemist, of High-road, Chiswick, was summoned for selling a quantity of 'Arsenical' soap, 'which was not of the nature and quality demanded.' Mr. Tyler, Inspector under the Act, for the Middlesex County Council, prosecuted, and Mr. Arthur Hutton, barrister, represented the defendant. Mr. Tyler stated that a tablet of 'arsenical' soap was purchased at the defendant's shop, which, on being analysed was found to contain an insignificant amount of arsenic. It was estimated that a pound of the soap would only contain the one-hundredth part of a grain of arsenic. (Laughter.) This amount, the analyst considered, was of no practical value.

"Mr. Hutton raised a technical objection to the summons on the grounds that the wrapper which contained the soap stated that the amount of arsenic used was 'small and was perfectly harmless.' The definition of the word 'arsenical' in all the standard dictionaries meant the introduction of arsenic in any quantity into the composition of an article. (Laughter.)

"Mr. Tyler stated that an expert had given it as his opinion that to be of any service to the public, arsenic to the amount of one and a half grains to the pound should be introduced.

"The Chairman: But the British Pharmacopœia has not laid down a standard.

"Mr. Hutton contended that as arsenic had been introduced into the composition of the soap, in however small a quantity, the charge must fail.

"The Chairman expressed his concurrence with this contention, and the summons was dismissed."

Most chemists sell arsenical soap for the complexion, and even advertise it. It is to be obtained as easily as "old brown Windsor." It seems evident from the context that, in this case, the necessary ceremonies for the sale of a scheduled poison were not performed, and, if so, the Pharmaceutical Society is bound to exercise its powers. It is not likely to do so, of course, against a member of its own Trade Union, but if the defendant in the case had been a grocer he would have stood a good chance of being brought to book for his heinous crime.

Between inspectors under the Food and Drugs Act and the Pharmaceutical Society, sellers of arsenical soap ought to have a merry time of it.

J. W. SIMPSON.

THE DEMENY CHRONOPHOTOGRAPH FOR MOVING PROJECTIONS.

L. Gaumont & Co., 57, Rue Saint-Roch, Paris.

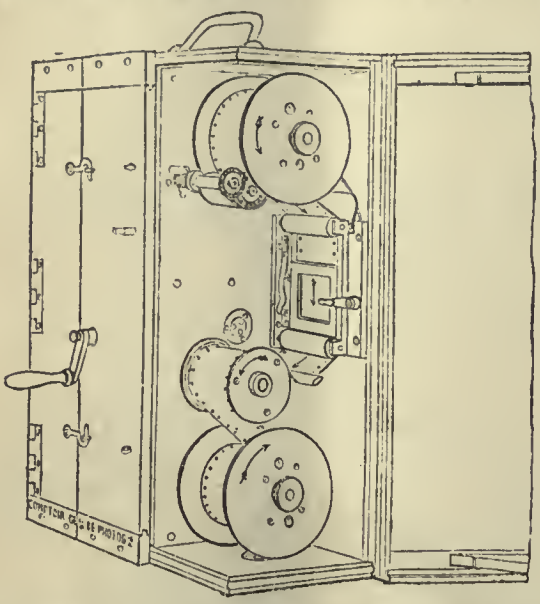
MONS. L. GAUMONT last week demonstrated the Demeny apparatus for taking and projecting "animated" photographs. We were enabled to examine some of the negatives, and prints and transparencies from them, that had been made in the camera. The pictures were beautifully defined, well exposed, and without flaws, and were the best we have hitherto seen—thus attesting both the good qualities of the Demeny camera and the film that was used in it.

The Demeny instrument takes and projects pictures, each of which gives an image having an area four times greater than animatographic pictures of the usual size. With regard to the appearance of the projected images on the screen, which were shown by means of the electric arc, they struck us as being the best, photographically and mechanically, that we have seen, making allowance for the fact that the demonstration took place in a comparatively small room. Shown on the stage of a theatre or in a large hall, we should imagine that there would be little or no perceptible movement.

It is a feature of the Demeny chronophotographic apparatus, that the camera is well adapted to form part of the projection system—the one instrument does for both purposes. The illustration shows the band of positives in process of being wound off, and the principle of the instrument will doubtless be grasped by means of the following brief descrip-

tion of the essential movements, understanding that the film works in the direction shown by the arrows:—

The bobbin upon which the pellicular band has been previously rolled by the aid of a winder is placed upon a fixed axis, and a friction-roller



drawer composed of a cylinder covered with an indiarubber casing and driven by a gearing placed in the interior of the apparatus, unrolls a given quantity of the pellicular band. This portion of the band engages itself between a guide and a friction roller along a passage, lined with velvet, in which is found a rubber frame placed opposite the window, and presenting an identical aperture to that forming the opening of this window.

This rubber frame, lined with velvet, is movable round a joint adapted to one of its sides, and when the film has passed, the frame is applied upon it, and it keeps it in gentle and continuous pressure by clasping in the spring wedge.

After having passed under the frame, the film engages itself *under* a friction roller, then also under a cam, then it is passed *upon* the dented cylinder, wherefrom it finally rolls itself upon the receptor bobbin previously placed upon the drawing axis.

It is claimed for the Demeny apparatus that it does not destroy or tear the films, and the examples shown bore out the claim. The mechanical movements appeared to us to be carefully devised and perfected, and, so far as we can judge, the Demeny apparatus is simple and certain in use, practicable, and effective. Certainly the results it has produced tell very largely in its favour.

THE BRISTOL EXHIBITION.

The International Photographic Exhibition, organized by the Bristol and West of England Photographic Association, was opened on Monday last at the galleries of the Fine Arts Academy, Clifton. It is to remain open until January 23. There are between eight hundred and nine hundred exhibits, many of them coming from abroad, so that the international character of the Exhibition is unquestioned. The energy of the Bristol Executive has been well responded to, and the result is that in the handsome galleries of the Fine Arts Academy a fine collection of works has been got together. It is not, however, representative of all phases of photographic art, inasmuch as the "Salon" element is conspicuous by its absence, although possibly this is no loss to the Bristol Exhibition.

The Awards.

Twenty-eight medals were placed at the disposal of the Judges—Messrs. Blanchard, Payne Jennings, B. Alfieri, R. Smith, and Hood Daniel—who in their report remarked: "The Judges consider that the exhibits, taken as a whole, fully sustain the artistic advance in photography, and in some cases they have felt compelled to award extra medals on account of the high standard of excellence of the work shown." As to the Champion Class, the Judges said: "In respect to this class the Judges feel that, notwithstanding the strong desire of the Association to award the medal, they could not select an exhibit that was, in their estimation, sufficiently in advance of its competitors to warrant them in making this high award."

Class I., Landscape or Seascape, half-plate or larger.—No. 14, silver medal, *An Old Hulk*, Charles Job; No. 51, silver, *The Crest of the Hill*, C. F. Tuston; No. 78, bronze, *Evening on Lago Maggiore*, M. T. Tylor; No. 22, bronze, *An Essex Homstead*, J. H. Gear.

Class II., Marine.—No. 475, silver medal, *The Harbour*, W. Norgrove; No. 476, silver, *Twixt Day and Night*, J. H. Gear; No. 460, bronze, *Twilight Grey*, W. C. Hemmona; No. 480, bronze, *Whitby*, J. Gunston; No. 469, extra bronze, *Seaside Snaps*, A. Lewis.

Class III., Landscape, 5 × 4 or under.—No. 233, silver medal, Series, C. F. Inston; Nos. 269 and 270, bronze, Thames Views, E. E. Barron.

Class IV., Architecture.—No. 302, silver medal, *Ann Hathaway's Cottage*, Harold Baker; No. 320, bronze, *A Bit of Old England*, Bulbeck & Co.

Class V., Portraits.—No. 494, silver medal, *Miss Lily Hanbury*, Harold Baker; No. 525, bronze, *Studies of Nan*, R. Ayton.

Class VI., Portraits.—No. 572, silver medal, *Study of a Head*, P. Lankester; No. 550, bronze, Portrait, O. W. Huntingdon.

Class VII., *Genre*.—No. 579, silver medal, *Chic*, B. Thornley; No. 596, bronze, *Lead Kindly Light*, R. Ayton; No. 602, bronze, *A Studio Corner*, F. P. Moffat.

Class VIII., Pictures by Artificial Light.—No. 648, silver medal, *The Miser*, H. E. Brightman; No. 658, bronze extra, *Study of Costume*, Harold Baker.

Class IX., Enlargements.—No. 369, silver medal, *Miss Lily Hanbury*, Harold Baker; No. 374, bronze, *Early Morning, Interlaken*, Rev. E. Rainbow.

Class X., Transparencies.—No. 774A, silver medal, set of eight, E. Brightman; Nos. 763 to 774, bronze extra, series, J. Phillip; Nos. 758 to 762, bronze extra, series, C. A. Brightman.

Class XI., Lantern Slides.—No. 780, silver medal, set of twelve, J. H. Gear; No. 779, bronze, set of twelve, F. Howard.

Class XII., Scientific.—Nos. 699, 700, and 707, silver medals, *Animals at the Zoo* (three sets), H. Sandland.

Class XIII., Process.—No. 719, silver medal, Three-colour Work, The Heliochrome Company; Nos. 723 and 735, silver, Collotype Reproductions, The Autotype Company.

Class XIV., Apparatus.—Silver medal, Gwyer's Improved Limelight Jet.

With a great deal of the work at Bristol we were already familiar, by reason of having seen it at various exhibitions during the past three years. The Judges appear to us to have acquitted themselves of their task with great success, for in this large display of singularly good and qualitatively even work, they must have felt no small difficulty in coming to their decisions. The award list shows that they have in many instances confirmed verdicts that have already been passed.

We think, as we thought three years ago, that the Bristol Committee adopts an unnecessarily minute classification, and that fewer classes are desirable. We have always been at a loss to understand why direct photographs should be judged according to area, *plus* quality, instead of by quality alone. We also desire to enter a friendly protest against the action of the Committee in hanging one of the exhibits. This is No. 197 in the Champion Class, *A Study*. It is a beautifully executed photograph on surface paper of a well-favoured young woman quite *in puris naturalibus*, with the exception of a piece of fabric which she holds to shield a small part of her person. We are quite sure that Mr. G. Lafayette is thoroughly sincere in regarding this exhibit as a work of art, and that the Bristol Committee are of the same opinion, but to us it appealed simply as the mere picture of a naked woman, having no other quality than that of being a good photographic record of a physical fact. Hence, we cannot think its inclusion in the Exhibition dictated by prudence or wisdom; and we repeat the hope we have often uttered in these pages, that Exhibition Executives will take the greatest care in dealing with photographs of this class. This photograph hangs in the Champion Class, in which the Judges withheld the gold medal. The class is only moderately good. We think that Champion Classes at photographic exhibitions are going out of favour, for some of the best work of the year is not now submitted to competition, so that the award, when made, by no means implies the value that once attached to it.

The Exhibits.

One result of what we may term the monotony of excellence which characterises this Exhibition, is to render the task of particularising the pictures at any length both difficult and undesirable, inasmuch as it would be hard to avoid platitudinous repetition. Let us, therefore, confine ourselves to the expansion of a few notes that we made during our survey. One is, that, since the last Exhibition here, the practice of "close-up" framing has come in for more general adoption, the result being that it is now possible to divest a wall of the spottiness and inharmony which once was a feature of most exhibitions. Again, we thought that white skies had long been relegated to neglect, but, in Class I., Mr. F. Spalding, with two views, *Waiting the Fox* and *Where Shadows Hide*, reminds us that progression in this important detail has not been so general as we imagined. He is one of several sinners in this respect We note in the class some capital Italian outdoor scenes by M. Victor Selb—a well-known Continental worker—and admirable examples by Gear, Gunston, Lintott, and many other habitual exhibitors.

The Champion Class contains such works as Alfred Werner's *Jadis*, a Reynolds-like portrait effect shown in the 1895 Salon; Bulbeck's *Ely Cathedral, Organ Staircase; The Master Hand*, by F. Moffat; a very good Portrait Head by R. S. Webster; Mr. R. J. Fry's last year's Pall Mall exhibit, *Parting Day*; Mr. Gear's *Silvery Morn*; Mr. Stieglitz's *Scurrying Home*; and many other well-known works. Lafayette, Harold Baker,

and Lankester also show fine examples of their skill in portraiture. But we thoroughly endorse the action of the Judges in withholding the gold medal, for there is nothing pre-eminently good in the class—nothing, that is to say, that has not, as the phrase runs, been done before, or can escape inclusion in the now classical Robinsonian description of "the usual thing."

Perhaps one of the strongest classes of the Exhibition is III., apparently devoted chiefly to hand-camera pictures. The forty odd exhibits are capital specimens of this class of work. Mr. Bulbeck's Thames Embankment views, printed in platinum, are little pictorial gems. These, with his other exhibits, place him quite at the head of the class. Mr. Inston and Mr. E. Evelyn Barron are also here prominent.

Architecture monopolises Class IV., among the ninety odd entries being contributions of great excellence from E. R. Bull, E. R. Ashton, Bulbeck & Co., J. T. Hopwood, Harold Baker, H. W. Bennett, Ernest Marriage, E. Brightman, and other masters of this branch of work. The class is, perhaps, one of the best collections of architectural photographs that we have seen for a long time.

In the Enlargement Class one has an opportunity of comparing the original with the enlarged picture. Mr. Harold Baker, a victorious pluralist here, and a worker of many-sided ability, shows a superb red carbon of *Miss Lily Hanbury*. The enlarged Swiss views of the Rev. E. Rainbow are exceptionally good in technique, and popular attention is sure to be arrested by the Autotype Company's well-executed enlargement from Mr. Watmough Webster's negative of Mr. Gladstone and Li Hung Chang. Mr. Harrison's seashore piece, depicting a dismantled craft *After the Storm*, also demands a word of praise. Messrs. West, F. Howard, Sandland, and T. H. Morton are also represented in the class, which is full of good examples of enlarging work.

We must own that the classes devoted to portraiture afforded us the most pleasure. To the Bristol Exhibition Committee we feel no inconsiderable gratitude for their encouragement of professional portraiture—portraiture not merely produced to gratify the whims of an individual exhibitor, out of whose hands it seldom goes, but to appeal to the public. We clearly recollect the portrait section of the 1893 Exhibition at Bristol—the "commercial" work suffered from an excess of retouching On the whole, the commercial portraiture of this Exhibition is an improvement on that of its predecessor, in that the art of the retoucher is less in evidence.

Mr. Yeo excels with several portraits of children, and of older subjects. His work manifests great improvement on past efforts. Mr. Harold Baker's contributions are marked by wonderful command over posing and lighting, and an unequalled power of infusing character into his sitters' faces. He is at home either in photographing a beautiful woman or a man with a rugged face. Mr. Lafayette has some highly finished specimens, and we welcome Mr. Byrne, who sends some charming studies of children. Three large portraits, by Mr. O. W. Huntingdon, are conspicuously good, but the exhibitor has a tendency to make the lights of his prints too hard, thus jeopardising the harmony of his effects. Lankester and Ernst Lambert also figure prominently in these classes.

The class for *genre* is well supported, and contains some undeniably clever things and some that just miss their mark. For example, Mr. R. Pratchett's boy who is unwillingly doing his *Home Lessons*, is taking the matter in a spirit of philosophy quite foreign to youths who are compelled to do as he is doing. We welcome the work of Mrs. Walter Gardiner, who shows two studies of an old rustic over his Bible on *Sunday Evening* and also over his pipe in *Quiet Enjoyment*. Such work, however, presents very little difficulty, although it is so good as to encourage us to hope that Mrs. Gardiner is capable of striking out into more original lines. Mr. C. M. Wane aims high in *Memories*. A girl has entered her father's study and is playing him a violin solo. The music evidently touches the widower's heart, for he looks sad and reflective. It is a cleverly executed bit of work, although we doubt the probability of a business man, seated at his study table and engaged with his papers, being consoled by the presence of a musical daughter. Orchardson once handled a similar theme—*Her Mother's Voice*—and the young lady, if we are not mistaken, was singing to her father in the drawing-room after dinner—a much more sensible plan than invading the poor man's study when he was writing cheques. *Lead Kindly Light*, a devotional subject, by Mr. R. Ayton, is clever of its kind. There are many other really able things in the class, particularly those by B. Thornley, Victor Selb, T. Lee Syms, F. P. Moffat, Miss Muriel Bell, and Dr. J. Griffiths, to which we wish we had space to refer in detail.

Subjects taken by artificial light occupy Class VIII. About thirty are shown, and the portraits by Mr. Baker and Mr. Lafayette betray all the softness of lighting of good daylight work. Mr. Fred Marsh has several examples of great technical excellence, depicting paper mills, gas works, &c., and a humorous study of a couple apprehending the presence of *Burglars* in the house.

The Photo-mechanical Class (XIII.) is notable for its interesting entries. Three-colour work is shown by Raithby, Lawrence, & Co. and the Heliochrome Company; half-tone by both firms; collotype by S. B. Bolas & Co. and the Autotype Company. The latter firm's collotypic reproductions on satin are of exquisitely beautiful quality. Flowers, animal studies, and the now inevitable skiographs appear in Class XII. (scientific).

With mention of the fact that the Lantern-slide Class is well supported in quality, we pass to the Transparency Class—always a strong one at Bristol. Mr. H. N. King has a series of stereoscopic transparencies, and single views from his well-known architectural subjects—quite in Mr. King's old and familiar delicate style. Mr. E. Brightman has some beautiful local views on glass, and it must be a source of satisfaction to this well-known old-time worker to find, side by side with his own pictures, two series from his sons—Mr. H. E. Brightman and Mr. C. A. Brightman, chiefly of West Country ecclesiastical architectural subjects, and quite irreproachable in execution.

Among the other contributors to the Exhibition are Messrs. W. C. Hemmons, J. Kidson Taylor, H. O. Isaac, F. H. Worsely Bennison (he shows some of his favourite sea pieces), H. Smith (some charming East Anglian landscapes), S. G. Payne, T. M. Brownrigg, Charles Job, J. H. Coath, W. Norrie, Captain H. Owen, John Warrack, &c.

The Apparatus Section.

Mr. Harold E. Brightman has a large collection of Ross, Zeiss, and Goerz lenses, Beck's Frena cameras, and Optimus apparatus, with examples of work done therewith. Mr. Henry Park's cameras, &c., are also shown by Mr. Brightman. Mr. M. W. Dunscombe has a case of lenses and cameras, and Watson's and Marion's apparatus, &c. The display of Messrs. Husbands comprises cameras of various kinds—hand and stand, lenses, shutters, enlarging cameras by Hume, projection lanterns, &c. A pretty and attractive exhibit is that of Messrs. Ferris, who have a case of specimens of chemicals used in photography tastefully displayed in an elegant show-case. Messrs. Willway show the Gwyer jet and saturator, the former of which obtained an award.

We conclude by congratulating the Bristol Executive on having got together a splendid Exhibition, and we remind them that in the year 1899 the opportunity will be theirs of closing one century and opening another with an Exhibition of photographs which, if it is as worthy of photography as is that just opened, will reflect nothing but credit upon all concerned. The Exhibition Committee consists of Messrs. H. W. Atchley, F. Bligh Bond, Edward Brightman, T. Butler, H. A. Hood Daniel, Thomas Davey, T. Taylor Gange, T. G. R. Harding, W. C. Hemmons, Sydney J. Hill, Thomas Letchford, W. Norgrove, Colonel Playfair, Geo. H. Perrin, John Phillips. Hon. Treasurer: Wm. Moline. Hon. Secretary: Martyn Lavington.

The Inquirer.

*** In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* Journal *useful and instructive.*

Quicklime.—(To J. Hastings.)—"Let this correspondent raise the 'perished' lime to red heat in a crucible or other suitable vessel, and after cooling he will find it all right."—J. Beavis.

Action of Salt.—(To Cum Grano.)—T. R. writes: "Your friend probably has an active imagination, or, if he finds salt removes stain from negatives, it is not 'good old pyro' stain, while its hardening action is *nil*. Probably he has found a 'mare's nest,' and persists in sticking to it."

Sulphite of Soda.—Collodio-Bromide writes in reply to J. B.: "Sulphite of soda, and more especially the bisulphite, and I dare say metabisulphite of potash, have undoubtedly a decided effect upon the colour of the developed image in collodion emulsion; the larger the quantity used apparently the redder the image. But in using the two last, great inconvenience arises from the uncertain quantity of ammonia required to neutralise the free acid they contain before the development can proceed. In fact, it is extremely difficult to know what is the real developing strength of the solution, and whether an image that is backward in coming up is suffering from under-exposure or over weak developer."

Toning with Mercury.—F. V. says: "I notice, in last week's Journal, reference is made to a method of toning gelatino-chloride and collodio-chloride prints by means of a solution of mercuric chloride and salt. But I gather from the paragraph that this treatment is to be preceded by toning with gold, so that there appears to be little advantage in the use of mercury. Is it not possible to utilise a very weak solution of mercuric chloride in place of gold, and in the same manner? When 'purple' tones are not desired, I think such toning is feasible, and as to permanence, I see no reason why it should not be sufficiently stable for much of the work now turned out."

Syntax also writes: "In reply to Cum Grano, although salt probably possesses no hardening action upon gelatine, it may possibly act as a preventive of frilling, and was, in fact, recommended for that purpose some years back. Its action in that direction depends upon the rapidity and ease with which it diffuses itself when in solution, a property that enables it to penetrate quickly into and out of the gelatine film. Frilling has been set down by some writers to the action of the strong hypo solution in forcing its way out of the softened gelatine film, and the action of the salt by aiding its easy diffusion, as well as by supplying a solution of higher specific gravity *outside* the film, was supposed to relieve the over-pressure from within. In a similar manner it has been used for the prevention of blisters in albumen paper. The power of salt in removing pyro stain—or, indeed, any kind of stain—is not very apparent."

"Pits" in Gelatine Films.—J. H. P. writes: "A week or two back Mr. A. L. Henderson spoke of 'pits' in gelatine negative films. I should like to know if he refers to a defect that I have recently met with in using a well-known brand of plates, though I have never experienced it with any other. I was under the impression it was purely a hot-weather trouble, but it has reappeared within the last few days, when, although the weather has not been severe, it can scarcely be called warm. The defect takes the form of small hollows or depressions in the film, which only make their appearance after the film has been developed some time. They vary in size, are cup shaped, and, in the large ones, the centre is transparent, and, of course, they show to the greatest advantage (?) in the sky of a landscape, or in a portrait negative. I should be glad if Mr. Henderson, or any other reader of these lines, could suggest a remedy, as I do not wish to relinquish that brand of plates."

Our Editorial Table.

The "Amber" Camera.

The Thornton-Pickard Manufacturing Company, Altrincham, near Manchester.

It is somewhat difficult nowadays to introduce a camera which may be allowed to possess any points of novelty, but in this task Messrs. Thornton-Pickard have, we think, succeeded. The Amber camera, which we have subjected to thorough examination and trial, is their latest introduction, and it not only embodies some useful and fresh features, but it has the further advantages of being practical and effective and extremely cheap.

The Amber is of the now familiar conical-bellows form, and is extremely light and portable. It is fitted with a turntable, and, by the simple pressure of two springs on the camera front, and the elevation of the stretchers, the front folds down into the open base-



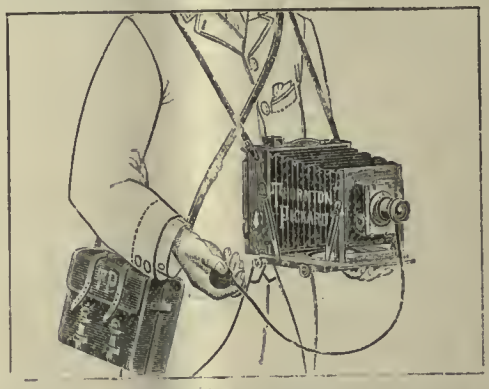
board without detaching. The front has an independent rising movement, and can be inclined to give the necessary swing that may be required. The shutter—one of the firm's well-known blind instruments—is fitted behind the lens.

By means of screw adjustments, an extension of some seventeen inches is obtainable, while, on the other hand, the instrument, when racked in, is so compact as to allow of the use of extremely short-focus lenses. The back, of course, has a swing movement, and also reverses; while other special features of the camera may be briefly indicated as self-locking stretchers, a spring-hinged detachable focussing screen, a plumb indicator, and a focussing scale for hand-camera work, thus constituting the Amber really a photographic luxury.

Perhaps the most novel feature of the camera lies in the way in which the dark slide is manipulated. The slides are of "solid" form, the plates being inserted from the front and firmly held by spring catches. The slide, as shown in the illustration, slips in from the top between the screen and the camera. No side-push is necessary, and the slide is removed by merely lifting the spring bar



at the top which holds it in position. We can testify to the fact that the movement is a very simple and effective one, working well



in practice, and when the camera is slung round the neck by means of a strap for hand-camera work is a great convenience.

There is one characteristic of Messrs. Thornton-Pickard's productions which always goes a long way towards making them popular. We allude to their "sweetness" of movement. The camera before us, in spite of its cheapness, is beautifully made and finished, and folds and unfolds, racks in and out, and generally comports itself with all the precision of the most delicately constructed scientific instrument.

The Amber camera is easy and pleasant to use. It does almost everything that a camera can do, and we have no doubt that in the coming season it will be popular among our amateur friends, for whose requirements it is well adapted.

News and Notes

The Scottish Acetylene Gas Company, of Glasgow, have now two studios in Glasgow working acetylene with their generator.

Alpine Club.—The Club is holding an Exhibition of Alpine Photographs and Old Prints at the Club-rooms, 23, Savile-row, W. The Exhibition remains open till December 31, from nine a.m. to six p.m.

The Austin-Edwards Monthly Film Negative Competition.—The Prize Camera for current month has been awarded to Mr. J. A. Wilson, Knowehead, Ballymena, Co. Antrim, for his negative, *Shoeing the Old Horse.*

Mr. Esmé Collings, of 175, New Bond-street, writes:—"In your notice of Mr. Friese-Greene's lecture, you state that the 'Lord Mayor' film was taken by Mr. Wrench. This is an error, as it was taken by Esmé Collings, of London and Brighton."

Photographic Club.—The next weekly meeting of the Club will be held in the Club room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, December 23. Mr. John McIntosh will read a paper entitled *Intensification and Reduction*, which he will illustrate with lantern slides. Visitors are welcome.

Terrible Acetylene Explosion in Berlin.—The Berlin Correspondent of the *Daily Chronicle* telegraphs:—"On Saturday afternoon, in the Moabit quarter of Berlin, a fearful explosion of acetylene gas occurred in the laboratory of Herr Georg Isaac, manufacturing chemist, which resulted in the death of Isaac and three of his assistants. The bodies were found horribly mutilated and burnt. The laboratory and its contents were wholly destroyed by the terrific force of the explosion."

The Factory Acts: A Photographer Prosecuted.—More than usual interest was taken in a case which came before the magistrates sitting at the Oldham Police Court recently, inasmuch as a lady factory and workshops inspector appeared to prosecute Joseph F. Beaumont, photographer, No. 6,

Park-road, for having committed a breach of the Factory and Workshops Act. Adelaide M. Anderson, factory inspector, stated that on Sunday, the 18th ult., about eleven o'clock in the forenoon, she called at this photographic establishment, which was a workshop within the meaning of the Act, and found a young person employed. An abstract of the Act had previously been forwarded to the firm. This Sunday work seemed to be a systematic arrangement, for they had two young persons who worked alternate Sundays. The points were not, she understood, disputed. This case had been taken more as a warning to others than anything else. Mrs. Beaumont, who appeared on behalf of her husband (the defendant), pleaded ignorance of the law. She did the business, and did not notice particularly the abstract when it was sent to her. It was entirely an error. A fine of 2*s.* 6*d.* and costs was imposed.

A Warning.—Messrs. Major & Darker, of Falmouth, write:—"We think if you insert the following particulars, you may save a brother photographer being victimised by a swindler, who is evidently going from one situation to another, leaving suddenly with all he can lay his hands on. In our case we engaged him as operator and retoucher a month ago, and on December 5 he suddenly disappeared, taking with him a complete half-plate outfit, and also a 5×4 Perken & Rayment R.R. lens, which he had been sent to do an out-door job with. From information received, he evidently left Plymouth on the fifth, and the police cannot find out his whereabouts. While he was with us, he mentioned that he had some cameras and lenses in pawn if we wanted to buy any, which, without a doubt, he obtained in the same way. The man is about 5 ft. 9 in., of a military appearance, rather fair, with long moustache only; when he was focussing or retouching, he wore eyeglasses, as he was rather short-sighted. If any of your readers have engaged a man of his appearance between the fifth and now, this will put them on their guard and perhaps save them being victimised. We may say we have a photograph of the man, which we would be willing to send to any one in doubt."

The Acetylene Explosion at Olney: Inquest.—An inquest was held at the Bull Hotel, on Friday, December 11, by Mr. J. Worley, to inquire into the circumstances attending the death of Ernest Munro Field, who was found dead in the cellar of his father's house. Mr. A. Field, father of the deceased, said his son was eighteen years old on Sunday, December 6. He last saw him alive on Wednesday evening, December 2, about 7.20, when he (deceased) was going to a drawing class. Witness did not reach home until eleven o'clock on Wednesday night. He noticed that his son's boots were not in the room, and sat up till 11.30, when he went to bed. As he did not hear his son arrive he arose about twelve, and on going into the cellar found deceased lying there dead. He called his wife, and then fetched the doctor. The deceased was very fond of engineering, and had been making acetylene gas in a generator of his own manufacture for two or three months. The generator was formerly in a shed in the yard, but had recently been taken into the cellar. Mrs. Freeman, who lives next door, said on the evening in question she heard a report as of a large gun, about 8.30. The report seemed to come from deceased's home, but as they could see nothing to cause alarm either at the back or the front of the house, no notice was taken of the matter. Dr. Grindon said he was summoned by the father of the deceased a little after twelve on the night in question. He accompanied him home, and found deceased lying on his back in the cellar quite dead. There was a severe wound on the face, the nose being cut clean through. The wound had bled profusely. There was a quantity of lime on deceased's hair and on his cap, which was on the generator. In his opinion death was caused by concussion, the effect of the blow on deceased's face. Mr. G. C. Rabin, one of the jurymen, said in his opinion deceased had gone down the cellar to recharge the generator, and on removing the lid the gas remaining in the generator exploded through coming into contact with the candle deceased was supposed to be carrying. The explosion forced the generator (an oil drum) sharply upward, striking deceased on the face, and inflicting the wound on deceased's face. A verdict of "Death by misadventure" was returned.

"Is a Portrait a Good Trade Mark?—This point," says *Invention*, "was settled in the Court of Appeal on December 2. In the case of Rowland *versus* Michell, an appeal against a decision of Mr. Justice Romer, the plaintiff was Mr. James Rowland, of Lant-street and Little Suffolk-street, Southwark, who is a manufacturer and wholesale dealer in confectionery, including certain cough-drops known as the 'Army and Navy Paregoric Tablets.' These are done up and sold in twopenny tins and penny packets. The labels on the tins and packets bear amongst certain other words those of 'Rowland's Army and Navy Paregoric Tablets,' and a mark or device of an oval ring enclosing a portrait of the plaintiff. This portrait is the substantial part of the plaintiff's trade mark, No. 155,638 (Class 42, Confectionery), which was registered in 1891. The defendant was John Michell, of Parkhouse-street, Camberwell, against whom the plaintiff commenced this action in October, 1895, to obtain an injunction to prevent infringement of the plaintiff's trade mark and imitation of his goods. The defendant, on the other hand, moved to expunge the registration of the plaintiff's trade mark. The defendant alleged that the portrait of an individual was not the proper subject of a trade mark, that it was not a 'distinctive device' within the meaning of Section 10 of the Trade Marks Act of 1888. He also alleged acquiescence on the part of the plaintiff, and that the plaintiff had in practice misrepresented the nature of his trade mark. The learned Judge held that the portrait formed a good trade mark, and overruled the other defences. He refused the motion to expunge, and granted an injunction restraining the defendant from selling his goods under three labels particularly complained of, or in any wrapper or in any manner calculated to pass his goods off, or enable other people to pass them off, as the goods of the plaintiff. The defendant appealed. The Court dismissed the appeal. The Lord Chief Justice thought that the portrait was a 'distinctive device' within the Act. The mark ought to be something capable of distinguishing the particular goods with which it was used from other goods of the same kind, and there could not well be anything more distinctive than the portrait of the manufacturer. His Lordship also held that there was no foundation for the other defences. Lord Justice Lindley and Lord Justice A. L. Smith concurred."

Patent News.

The following applications for Patents were made between December 2 and 9, 1896:—

Cameras.—No. 27,363. "Improvements in or connected with Photographic Cameras." W. E. Asquith.

Cameras.—No. 27,433. "Improvements in Photographic Cameras." B. F. S. Baden-Powell.

Screen Kinetoscopy.—No. 27,585. "Improvements in Apparatus for Taking and Exhibiting Photographs in Series." Complete specification. E. Werner and M. Werner.

Printing Frames.—No. 27,619. "Improvements in Photographic Printing Frames." H. J. Spratt, A. S. Spratt, and G. A. Spratt.

Objectives.—No. 27,635. "Improvements in Photographic Objectives." P. Rudolph.

Kodak Film Cabinet.—No. 27,647. "A New or Improved Kodak Film Cabinet for Preserving Kodak Negatives and the like." M. L. Sanders.

Frames.—No. 27,723. "Improvements in Frames for Photographs, &c." D. A. P. Anderson.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
21	Bradford	Members' Lantern-slide Competition.
21	Ealing	Discussion: *Backed Plates versus Films or Sandell Plates.*
21	North Middlesex	*General Survey of Year's Work.* H. Smith.
21	Richmond	*Finishing the Negative.* The President.
21	Southland	Instantaneous Effects.
21	Stafford Y.M.C.A.	*Intensification and Reduction of Negatives.* Mr. Cooper.
22	Birmingham Photo. Society	Members' Lantern Evening.
22	Hackney	*The Manufacture of Wall Paper.* Jno. Gardner.
22	Newcastle-on-Tyne	*Pictorial Photography.* A. H. Hinton.
22	Rotherham	Prize Slides, 1896.
23	Borough Polytechnic	Members' Open Night.
23	Leytonstone	*An Evening with the Planets.* H. W. Gould, M.B.A.A.
23	Photographic Club	*Intensification and Reduction.* John McIntosh.

ROYAL PHOTOGRAPHIC SOCIETY.

December 15,—Photo-mechanical Meeting,—Mr. Leslie E. Clift in the chair

Photo-Engraving Troubles.

Mr. Andrew Wybrandt Penrose read a paper on

Some Probable Causes of Trouble in Photo-engraving,

dealing in a simple manner with the purity or otherwise of some of the chemicals employed in process work, and demonstrating methods for the detection of impurities. Ammonium bichromate nearly always contains free chromic acid, which he had no hesitation in saying was the cause of bichromate poisoning, and the only remedy was the use of the recrystallised variety. Ammonium sulphydrate, or "stinko," was often watered down, when it merely blackened the outer surface of the silver salt in the negative, producing bad stains, and operators should only ask for and accept that of the strength known as "fort." Glacial acetic acid should have a specific gravity of 1·058, and should solidify at 50° Fahr.; if, on the addition of a few drops of a solution of $AgNO_3$, the acid remained clear, sulphates and chlorides were not present. The presence of sulphuric acid in nitric acid might be detected by the addition of a few drops of a solution of barium chloride, when a white precipitate would be formed if sulphuric acid were present. The so-called explosions of nitric acid were probably not explosions at all, but breakages of carboys, arising from accidents, or were due to NO_2 not finding room for expansion. Dragon's blood had found little favour in England, although much used in America, and this was probably due to the fact that the sources of supply were different. The American variety was drawn from a tree growing in the West Indies, and called *Pterocarpus draco*, while that met with in England came from the East Indies, and was obtained from a palm-tree called *Calamus draco*, and from other plants in Guiana and South Africa, and was always more or less adulterated. A rough test for dragon's blood consisted in igniting a small heap upon a good burning paper; it should burn readily and steadily, leaving but little ash, and giving off an agreeable odour, not unlike gum benzoin. The most suitable strength of cyanide was about thirty-five per cent., which would do its work in less time, with less staining, and would last longer than the lower grades. The specific gravity of ether should not exceed ·725; it should have no acrid smell, should be washed and redistilled at least once, and if one drop of tincture of iodine were added to one ounce of ether, the colour should not be discharged after standing for three or four hours. The use of a hydrometer or specific gravity bottle was strongly recommended. Filter-papers frequently contained impurities, the Swedish variety being the best and the Dutch the worst. Silver nitrate solution should never be filtered through paper, but should be allowed to subside and then decanted. In boiling down silver baths, the cracking of the "crock" might be obviated by covering the top of the tripod with fine copper gauze, or by placing the basin in a sand bath. The paper concluded with the expression of the opinion that the severe competition in the photo-engraving business had compelled principals to buy rather from considerations.

of cheapness than quality, and that depreciation in quality must inevitably follow when the market value of an article was reduced to the lowest point.

Mr. W. E. DEBENHAM understood Mr. Penrose to say that bichromate poisoning was caused by free chromic acid in ammonium bichromate, but he was under the impression that cases had occurred where bichromate of potash was used. He had never traced any injurious effect to filter papers, and pointed out that it was not easy to discontinue their use, because, although sediment might be got rid of by means of decanting, anything which rose to the top of a solution could not be so treated. He did not think the quality of chemicals had deteriorated with the reduction in price which had taken place in recent years.

Mr. H. CHAPMAN JONES said his experience was that the standard of purity in chemicals was well maintained.

Mr. T. BOLAS also said that when chemicals were obtained from reputable firms, they could be depended upon to be as represented.

Mr. CARL HENTSCHEL wished something had been said upon the subject of fish glue, which he thought was liable to be affected by atmospheric influences. He had noticed, also, that bichromate of potash, when mixed with other chemicals, was considerably affected by a thunderstorm. He asked whether there was any objection to filtering silver baths through the finest and purest cotton wool.

The CHAIRMAN complained of the great variation in different samples of fish glue which were supposed to be identical.

Mr. W. GAMBLE agreed that fish glue was subject to atmospheric influence, a good many difficulties arising during cold weather. Greasy spots sometimes appear, due, he thought, to the partial solidifying of the essential oil used in the preparation of the glue. He had got over this trouble by shaking up a little ether with the glue, and afterwards filtering. Temperature was at the bottom of a good many faults for which chemicals were blamed.

The CHAIRMAN'S experience was that ordinary fish glue gave better results than the clarified variety.

After further remarks by Messrs. Vincent, Gamble, Herbst, Hentschel, and the Chairman,

Mr. PENROSE replied to some of the points which had been raised. He thought the Swedish filter papers could be relied upon, but absorbent cotton wool was a very good filter, and acted rapidly. It was possible that nitric acid might explode spontaneously under some extraordinary conditions, probably due to the liberation of nitric peroxide within a confined space, and without a ready outlet, but the so-called explosions were generally caused by the fracture of a carboy. Fish glue was a subject calculated to send the student to an early grave, and any one who discovered practical methods of remedying the evils arising from its use would render a valuable service to photo-engravers.

The CHAIRMAN, in moving a vote of thanks to Mr. Penrose, invited all who were interested in process-work to attend the monthly photo-mechanical meeting of the Society, and to take part in the discussions.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 10,—Mr. T. E. H. Bullen in the chair.

The CHAIRMAN referred to a new form of permit for the reproduction of copyright pictures as suggested by Mr. Gambier Bolton in the ALMANAC, with the stipulation that after its use for the purpose agreed, the block shall be destroyed by the printer. Speaking from his own experience with engravings, the Chairman said it was hardly safe to depend on the good faith of the printer to do this. The plates, or reproductions of them, generally found their way into the market after ten years or so, and, in his opinion, the only safe course was to have the block returned after use. The form given in the trade, and used by Cassell, Routledge, and others, was in terms which gave the right of reproduction, for a certain sum, in the publications of the party, and those only, the block to be returned and not otherwise parted with or sold. A short discussion ensued.

Mr. PAUL MARTIN asked for information as to the best way of coating plates with gelatine. His idea was of making lantern slides by the carbon process, but he had been much troubled to avoid bubbles, which appeared in very minute form.

Mr. A. HADDON said the gelatine should be filtered, and recommended the use of a teapot for pouring the same. He proceeded to sketch a contrivance consisting of a tube, one end of which was covered with a muslin strainer, passing through a bung fixed in the teapot, through which the surplus of gelatine from the plate is filtered before mixing with the bulk itself.

The CHAIRMAN added that a slight addition of alcohol to the gelatine enabled the latter to flow with more ease.

PYRO-METOL DEVELOPER.

The CHAIRMAN said he had recently been experimenting with various developers, and had found very extraordinary results from the use of pyrogallic acid and metol in combination. The mixture possessed all the energetic qualities of the metol, and at the same time the density giving power of the pyro. The tests were made with a Warnerke sensitometer, to which two plates were exposed in the ordinary way. These were developed for ten minutes with a pyro-soda developer, and, at the expiration of this time, washed. He then tried to see whether they would go any further, and to one plate put a fresh pyro-soda developer, while the other was placed in a pyro-metol developer. The former seemed to have attained its utmost, however, and the second treatment had apparently no influence whatever. The second plate, however—that in the pyro-metol solution—developed up four or five more numbers on the scale; and, while the highest tint with the pyro-soda was about twenty, that of the pyro-metol reached twenty-four or twenty-five. Further experiments were made with two plates which were exposed in the same way, and developed, one with pyro-soda and the other with pyro-metol, from the commencement. This latter showed ten numbers and considerable density in the lower numbers before any image was shown by the pyro-soda, but the ultimate result was not so great, the pyro and metol having an advantage of three or four gradations. In reply to a question, he said he judged by the negatives.

PHOTOGRAPHIC CLUB.

DECEMBER 2,—Mr. Stretton in the chair.

Messrs. George Hana, Thomas Fall, and George J. Wright were elected members of the Club.

Mr. JAMES SINCLAIR gave a practical demonstration of the process of

CARBON PRINTING WITHOUT TRANSFER,

commonly known as the Artigue process. Touching lightly upon the history of the process, Mr. Sinclair said that it was the oldest of any carbon printing method. The Artigue tissue was probably coated with a gelatine substratum, upon which was spread some vehicle, perhaps albumen, containing the pigment. Only one colour, black, was available at present. The tissue is fairly translucent, and this is a factor essential to success. The demonstrator recommended the immersion of the tissue in a two per cent. bichromate bath, which might advantageously contain a small percentage of alcohol. By this addition certain troubles which might arise during the drying of the tissue if the temperature of the drying-room exceeded 65°, or during its sensitising should the temperature of the solution exceed 60° Fahr., are avoided. Five per cent. of alcohol is a suitable amount. The tissue can be sensitised by brushing a five per cent. solution of bichromate of potassium over the back, but the immersion method was preferable. The tissue should be used soon after being sensitised. The continuing action of light is slight, but success is assured by using freshly sensitised tissue and developing the pictures without unnecessary delay. The time of printing required must be first ascertained by a trial print. A sensitometer is necessary, and he preferred a strip of paper sensitised in the same bichromate bath as the tissue. This paper turns brown upon exposure to light. After exposure, the image is slightly visible by transmitted light—if very strong, over-exposure may be anticipated. Development is effected by soaking the exposed paper, first in cold water, and then in warm water—temperature 82°. This must be ascertained accurately with the aid of a thermometer. The image appears in relief in this second bath, and must subsequently be "developed" by pouring upon the tissue (which must be properly supported for the purpose) the special "sawdust soup" at a temperature of 65° to 70°. In effect, the real development depends upon the erosive action of the moist sawdust. For over-exposure a thicker "soup" is required, in order to remove, by increased friction, more of the pigment. For under-exposure the printed tissue may be placed direct into the warm-water bath—temperature 82°—without previous immersion in cold water, and this variation should be followed by the use of a thinner "soup." The image must be developed until it appears rather lighter than it is ultimately desired to be, as the print darkens in drying. When sufficiently developed, wash the print in cold clean water, and place in an alum bath. As an alternative the print may be dried before the alumming, and the development may be afterwards carried farther if desirable. It was added that a brush might be used as a substitute for, or as an assistance to, the "sawdust soup" in the development if it were desired to give a quasi-artistic appearance to the prints. Mr. Sinclair gave a successful demonstration of the process. He also showed some examples of work by it which were excellent in every way.

DECEMBER 9,—Mr. George W. Tottem in the chair.

Major Thomas was elected a member of the Club.

Mr. HEDLEY M. SMITH described the

CHRONOPHOTOGRAPHER,

a new cinematographe apparatus made by Mr. Gaumont, Paris, said Mr. Smith, was the home of the cinematographe. There were good machines and bad ones there as elsewhere. For the best machines the very highest prices were willingly paid, whilst the inferior articles could be bought as low as seventy-five francs each. Mr. Gaumont's apparatus moves the film without relying upon the dragging action of a toothed wheel, and in this differs from most other machines. The positive image upon the film occupies four times the usual area, and the instrument therefore gives a more luminous projection. Films of any length can be used in the instrument, and the electric light is to be preferred on account of its greater power.

Mr. GAUMONT demonstrated the use of his machine, and showed a succession of pictures comprising the following subjects:—Oxen ploughing, Japanese ballet, Soudanese bathers, departure of the motor cars for Marseilles, Loie Fuller in the Serpentine dance, dragoons at exercise. The instrument worked in a smooth and comparatively noiseless manner, and the steadiness of the image was noticeable. After the demonstration Mr. Gaumont showed the working parts of the instrument, and through Mr. Hedley Smith answered several questions.

Mr. DRAGE said he was sure that everybody was pleased with what had been shown, and especially pleased to see Mr. Hedley Smith. The meeting was indebted to him and to Mr. Gaumont for a very enjoyable exhibition.

Mr. SMITH returned thanks for an attentive hearing on behalf of himself and Mr. Gaumont. He was very glad to meet with his old friends again.

Mr. CHARLES WALLIS gave a short lantern lecture entitled,

MY HOLIDAY TRIP WITH THE CAMERA.

Mr. Wallis accompanied the exhibition of his slides with a running fire of characteristic humour and wit.

Hackney Photographic Society.—December 8, Mr. R. Beckett presiding.—Mr. J. H. GEAR gave a lecture on

COMBINATION PRINTING,

and showed a number of fine prints and slides to illustrate his remarks. On the question of getting clouds on the same plate as the landscape, he said that in most cases such was not desirable, because, if the clouds were secured, in all likelihood, they would not agree with the composition of the subject. No landscape or seascape should have a perfectly white sky, neither should the latter be represented of one uniform tint. It might be argued that, occasionally, this was a perfectly natural condition—that, when the view was taken, there were no clouds. To this he would reply by asking, Why should nature be portrayed in her inartistic moods, rather than be represented in a way that would appeal to the cultivated taste? The lecturer then dealt thoroughly

with the various methods of combination printing, such as the introduction of figures into landscapes, printing in skies under different conditions of subject, &c. After showing the need for, and application of, combination printing, Mr. Gear warned those who contemplated taking up the subject of the necessity of being careful in every detail, or their sins would find them out.

North Middlesex Photographic Society.—December 14, Mr. A. J. Golding in the chair.—The following gentlemen were nominated for membership:—Messrs. R. J. Wilson, J. Durston, C. S. Ball, J. Angus, Ernest Clarke, C. H. Wilkins, and Albert Lord Tyler. The CHAIRMAN read a telegram from Mr. Horsley Hinton, regretting he was unable to read his paper on

PICTORIAL PHOTOGRAPHY.

In his absence, the paper was read in a very able manner by Mr. MARCHANT. The paper provoked a great deal of discussion, in which Messrs. Child Bayley, Cox, Bennett, Golding, Goodwin, Marchant, Mattocks, and Mummery took part. A vote of thanks was passed to Mr. Horsley Hinton for his paper, and to Mr. Marchant for reading it.

Polytechnic Photographic Society.—December 9.—The HON. SECRETARY gave a demonstration with the oxy-hydrogen lantern, explaining the various parts of a lantern, jets, limes, &c., and passed some slides through illustrative of the many tones, shapes, and processes used in lantern-slide making. Special tones for special subjects called forth many opinions. The meeting closed with the addition of two new members. At the New Year there will be an exhibition of members' work.

Putney Photographic Society.—December 7, Dr. W. J. Sheppard in the chair.—Mr. JOHN A. HODGES (Vice-President) gave

HOLIDAY RAMBLES WITH A CAMERA.

A most excellent set of slides, including scenery of Devonshire, Wales, the Lake District, &c., was shown. One or two had white margins, which formed quite a pleasing variation to the usual close-masked slide. The hall (specially hired for the occasion) was well filled with an appreciative audience of members and friends.

Richmond Camera Club.—December 7, Mr. Purcell presided.—Mr. Ef DOCKREE, of the Brixton and Clapham Camera Club, gave an exhibition o, lantern slides. Mr. Dockree's work is well known in the photographic world and the slides he showed were as varied in subject as they were excellent in quality, and were described in a lucid and humorous manner. The evening was voted by common consent one of the pleasantest in the annals of the Club.

South London Photographic Society.—Mr. H. E. Farmer in the chair.—The PRESIDENT (Mr. F. W. Edwards, F.R.P.S.) gave an address on

ISOCHROMATIC PHOTOGRAPHY.

He first gave an outliue of the subject, afterwards dealing with the advances made during the last two or three years. He afterwards, by means of a lantern, projected images of various coloured objects under notice on the screen, and, by means of a second lantern, photographs of the articles taken with ordinary and the different isochromatic plates on the market, with and without colour filter, were thrown on the screen and explained. The PRESIDENT promised to give a lecture on the making of colour filters at a later date.

Woolwich Photographic Society.—December 10, Mr. H. H. Barker in the chair.—A popular lecture was delivered to about 100 members and friends by Mr. F. O. BYNOE, of Messrs. R. & J. Beck, entitled,

INSTANTANEOUS PHOTOGRAPHY,

illustrated by lantern slides taken with the celebrated Frena cameras. Mr. Bynoe gave some very practical hints as to holding a hand camera for exposure, also the use of the swing back, showing pictures taken with and without the swing back. The slides shown were of excellent quality, and quite bore out the lecturer's statement that a swing back was an absolute necessity for certain kinds of work. Mr. Bynoe also explained the use of the Frena magnifier by means of a mechanical slide, which showed clearly the means of bringing close objects in sharp focus with a fixed-focus camera. A very hearty vote of thanks was accorded Mr. Bynoe for his very interesting lecture.

Birmingham Photographic Society.—December 8, Mr. G. F. Lyndon, J.P., in the chair.—About thirty members present. Mr. P. T. Deakin Hon. Assistant Librarian) gave a One-Man Exhibition and a short account of his methods of working. The Exhibition consisted of 150 half-plate pictures printed in bromide, platinotype, and carbon, the subjects being very varied, comprising landscape, architecture (interior and exterior), cloud, flower and figure studies, and portraiture. In his remarks upon his method of working, Mr. Deakin explained his very systematic way of keeping a record of all negatives and prints. The developer used was pyro-soda, and during the last twelve months or so he had taken to printing in carbon, as, in his opinion, it was by far the best process for rendering all the delicacy of the negative. He worked entirely with home-made apparatus. A collection of views of Cannock Chase showed that Mr. Deakin knew how to make a picture from very simple surroundings. The CHAIRMAN, In proposing a vote of thanks, congratulated Mr. Deakin upon the excellence of his exhibits and the care with which they had been printed and titled. Mr. ROBINSON, in seconding the proposition, also congratulated Mr. Deakin upon the excellence of his work and the variety of the subjects selected. Messrs. UNDERWOOD and FOWLER supported the proposition.

Cardiff Photographic Society.—December 11.—Mr. HARRIS made some interesting remarks on

BROMIDE PRINTING,

handling his subject in a very scientific manner. There was a good deal of discussion upon the points raised, but Mr. Harris laid stress on there being, as a rule, too little importance attached to varying the distance from the source of light in making contact prints. Several examples were shown of prints produced under the conditions recommended. The relative speeds of the various commercial papers was mentioned in connexion with remarks upon the scale of gradation obtainable from slow and rapid kinds. Mr. Harris succeeded in showing that, in a great measure, success in bromide printing depended upon the selection of a suitable distance from the source of light as much as anything else, and that this distance depended upon the character of the negative and the result required. The acetylene light was shown by Mr. Jesse Williams, and much admired. In the club lantern it gave a well-illuminated six or seven feet disc at about twenty feet from the screen. The light was very steady and appeared likely, with ordinary care, to give no trouble.

Liverpool Amateur Photographic Association.—December 10, the Annual Meeting was held in the Artists' Club, the retiring President (Mr. J. Sirett Brown) in the chair.—Sixteen new members were balloted for and elected. Dr. J. W. Ellis, F.E.S., was elected President for the ensuing year, the Vice-Presidents being Messrs. W. Prior Christian and E. Rimbault Dibdin. The Hon. Treasurer (Mr. P. H. Phillips) and the Hon. Secretary (Mr. Fred A. Schierwater) were re-elected. The customary votes of thanks to the officers and Judges for their services, and to the Artists' Club for the use of their room in which to hold the meeting, were passed unanimously. The Judges' awards in the annual competition were then announced as follows:—Champion Class.—Challenge cup and gold medal: Dr. J. W. Ellis. Half-plate and under: silver medal, Rev. William Smith; bronze medal, Mr. J. D. Paterson. Over half-plate: silver medal, Dr. Llewellyn Morgan; bronze medal, Mr. E. R. Dibdin. Lantern Slides.—Silver medal, Dr. J. W. Ellis; bronze medal, Dr. Llewellyn Morgan. Enlargements.—Silver medal, Mr. Joseph Appleby; bronze medal, Mr. Edwin Sinnett. Stereoscopic Slides.—Silver medal, Mr. J. T. Norman-Thomas. Hand-camera Work.—Silver medal, Dr. J. W. Ellis. Portrait.—Bronze medal, Dr. Llewellyn Morgan. Ladies' Competition.—Silver medal, Mrs. Bell. Members and their friends are invited to view the pictures, which are now hung in the Society's rooms, Eberle-street, until the end of the month. The Judges were Messrs. J. Lederer, G. Watmough Webster, J. W. Wade, G. E. Thompson, and W. I. Chadwick.

Wakefield Photographic Society.—December 11.—The meeting was devoted to an exhibition of lantern slides made by members, and slides by J. Briggs, H. M. Briggs, Robson, Holmes, Wilcock, and Hon. Secretary were shown. After the exhibition, Mrs. Aspinall Addison presented to Dr. Clarke a silver medal, and to W. Holmes a bronze medal, being the first and second prizes for prints in the recent competition; also a silver medal to R. Robson, and a bronze medal to J. Briggs, jun., being first and second prizes for lantern slides.

Dundee and East of Scotland Photographic Association.—December 5.—A successful *conversazione* was held in University College, Dundee. The Council of the Association received the guests in the Botanical Class-room, after which an adjournment was made to the Mechanical Laboratory, the interior of which was converted into a tea-room for the occasion. The company then assembled in the Mathematical Lecture-room, where Professor Steggall, President of the Association, delivered an address on the progress of photography. The President was accompanied, amongst others, by Messrs. D. Ireland, Thomas Berry, V. C. Baird, W. F. Hill, G. G. Maclaren, W. H. Tittensor, and Andrew Stewart. The PRESIDENT, at the outset, in name of the Council of the Dundee and East of Scotland Photographic Association, extended a hearty welcome to the assembled guests. He then proceeded to sketch the earliest beginnings of photographic art, and passed on to deal with some of the considerations that seemed to him essential in deciding for a society like theirs not only its *locus standi*, but its actual value as an educational and refining influence in their midst. He glanced back to the earliest observations made on the effects of light in the nature of bodies. They now knew that this was the chemical action of light, and they recognised that light was inseparable from heat, even although heat might exist without light being created, as far as their only test, their sense of sight, detected. It was not easier to suppose an earlier effect of light than the growth of trees, or an earlier observation than that of the colouration of the human skin by light—what was commonly called sunburn. It was truly an astonishing fact that their vast deposits of energy in the form of coal were simply products of the tireless action of sunlight. Millions of pounds of oxygen were daily consumed by everything that breathed, by every fire that burned, by every metal that rusted, and millions of pounds of carbonic acid were thus produced. They did not always remember, however, how the atmosphere, that great storehouse of oxygen, was from day to day replenished. In the presence of light, but not otherwise, all growing vegetable matter had the power of assimilating the carbon in which its structure mainly consisted from this carbonic acid, and of delivering the oxygen pure and restorative to the exhausted air. By that action were formed the prehistoric forests that in the convulsions of the geologic infancy of their planet were crushed together to form the coal measures of later days. That great fact was never chronicled through contemporary observation, and doubtless the first recognition of the photographic action of sunlight was really afforded by its effect on the complexion. It was only in the latter part of the eighteenth century that the celebrated Priestley called attention to the wonderful powers by which Nature through light renewed the air they breathed, but from that time onwards vigorous efforts were put forth to determine accurately the nature of the chemical action that underlay the visible influence of light on certain substances, and these efforts resulted, in the years 1826 to 1829, in the practical applications of this action to the production of photographic pictures. The progress had been vast, but even after fifty or sixty years of research and knowledge as to the real action of light on the silver salts usually employed in photography, it was in such a state that they were forced still to regard these actions as in the highest degree complex and baffling. Photographers, however, could claim some credit for the progress attained during the past year or two—progress that, inspired by the claims of this art alone, had been of immense value in all the range of optical and many other sciences. The demand for transparent films had been accompanied by a vast improvement in the manufacture of celluloid, and that material had again been applied to many other practical purposes. The demand for lighter lenses had helped to teach the working of aluminium. The exigencies of the focus had stimulated the glassmaker, until glass could be produced to satisfy the most extreme requirements of the photographer, astronomer, and microscopist. The speed of plates had been gradually improved without that loss of fine texture which

used to attend rapidity. In 1844 a writer said that in good sunshine an edifice could be copied in a minute; nowadays, one hundred well-exposed views of the same subject could be taken consecutively within a second. The mechanical processes of printing were being daily improved. Advances had been made in colour printing sufficient to occasion several pretty quarrels, enshrined within the pages of the photographic press, and some of the results were fairly satisfactory. The real problem of colour printing had not progressed far, and the medium required for a simple process had yet to be found. Proceeding, he alluded to the two recent inventions of the cinematograph, and a discovery that consisted in the revelation by the camera of rays of light that did not affect the sense of sight. Alluding to the Röntgen rays, the remarked that many of the most interesting specimens of the action of these rays yet produced had been made in the laboratories of University College. Continuing, he said that a society like theirs must depend on other considerations than those of research and invention for its permanence and its success. The human interest, in which were included the love of Nature, appealed more strongly to them than any other. Appreciation of Nature was, he thought, the greatest gift to man, and the development of that appreciation was an educational power of the greatest value, and he claimed for the photographic art that its reproduction of the features of the places they had seen tended to cultivate an artistic appreciation of Nature. Before closing, Professor Steggall alluded to the aids afforded to amateur photographers through the Association, remarking that it was a historic fact that their club-rooms, with their dark room, enlargement and other apparatus, helped to draw the members together.

Capetown Photographic Club.—November 14.—The Annual Meeting of the Capetown Photographic Club was presided over by the Vice-President (Professor W. S. Logeman), and there was a large attendance of members. A number of new members were admitted, and the following report was read:—In submitting the sixth annual report, the Council have to state that, although a number of members have removed from Capetown during the year, and the roll has been cleared of several more who have not paid their subscriptions, yet there is a small increase in numbers, the roll now standing at ninety members and eight honorary members. The balance-sheet shows a balance due to the Treasurer of 3*l.* 19*s.* 6*d.*; assets, 10*l.* 18*s.* 9*d.*; liabilities, 3*l.* The attendance at monthly meetings has been good. A very successful *conversazione* was held in November, when the prints sent in for the 1895 competitions were on view, and also a number of other contributions from members. The competition slides, with a number of others, were exhibited during the evening, and light refreshments were provided, under the superintendence of a committee of ladies. The photographs were on exhibition to the public on the following day, but only some twenty-five persons visited. In consequence of the alteration in the rules, the number of prints sent in to the monthly entries have been exceedingly few, and, in fact, for the last few months none have been received. The Council much regret this, and would urge the members to remedy this matter during the forthcoming year. The value of these monthly entries, especially to the younger members, is great, and, in addition, the valuable collection of photographs is lost to the Club album. In connexion with the annual competitions, the Council have to acknowledge the kindness of Mr. E. R. Morris in having prepared and presented to the Club a number of certificates of high artistic merit for use at the annual competitions. Also to the following members for placing silver medals at their disposal for the purposes of this year's competition:—Messrs. D. C. Andrew, J. R. Wignall, Colonel Homan-Ffolliott, and Professor W. S. Logeman. The 1896 competitions were arranged with a larger number of classes than the previous year, but the number of members entering for the various classes was only twenty, one more than last year. Very few entries were made in the junior classes; in fact, in four classes there were none, in two classes there were only two, and in one class only one entry; it would therefore seem advisable to discontinue the junior classes. In the classes open to members of any photographic society of South Africa, Class XX., for general work, the competition was not so keen, eight entries only having been received against a much larger number last year. The other societies represented were the Kimberley Camera Club and the Port Elizabeth Society. It was thought advisable that all the classes "open to members of any photographic society" should be sent to England for judging, so the Council wrote to the Secretary of the Royal Society of Great Britain requesting that, if possible, he would arrange for their Judges to adjudicate on them. Mr. Charles Mills (who was just visiting England at the time) very kindly took the prints (eight sets of six) and eight sets of lantern slides with him, and delivered them to the Royal Society with our request; but, after some little delay, they were returned to him, with a letter intimating that the Judges had so much work to do in connexion with their own Exhibition that they did not feel justified in asking them to devote any more time to such matters. The Council regret that they are not yet in possession of the awards for Class XXI., stereoscopic slides, which, although sent to Mr. Chadwick, of Manchester, a week previous to the other English parcel, have not yet been reported upon by him. The most cordial relationship continues to exist between ourselves and other kindred societies in South Africa, the only club not in frequent communication being that of Natal. Some good field days have taken place, notably to Groot Constantia, to Oude Kraal, to Lourensford, the residence of Sir James Sivewright; and also in connexion with the Mountain Club, on October 5, to Tulbagh. The report having been unanimously adopted, the following gentlemen were elected as officers for the ensuing year:—*President:* Dr. David Gill, Astronomer Royal at the Cape.—*Vice-President:* Mr. A. J. Fuller.—*Council:* Messrs. T. W. Cairncross, H. E. Cope, J. P. Edwards, A. McLeod, J. Powell, E. J. Steer, J. R. Wignall, and Dr. D. J. Wood.—*Secretary and Treasurer:* Mr. E. E. Harrhy, G.P.O., Wale-street.

1896. FORTHCOMING EXHIBITIONS.

December 29-Jan. 2. Borough Polytechnic Photographic Society. P. C. Cornford, 103, Borough-road, S.E.

Dec. 1896-Jan. 1897 Bristol International. Hon. Secretary, 20, Berkeley-square, Clifton, Bristol.

1897.

January 14, 15 ..... Weymouth and District Camera Club. E. C. Bennett, 10, Newberry-terrace, Weymouth.

February 1-27 ..... Glasgow *Evening Times* Camera Club. The Secretaries, *Evening Times* Camera Club, 46, Gordon-street, Glasgow.

March 6-13 ..... South London Photographic Society. Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE ROYAL PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—It was announced at the last meeting of the Royal Photographic Society that I had resigned the Presidency. I think it due to the fellows and members of the Society that I should state the reasons which led me to take this step, so that no misconception may arise. My resignation was announced from the chair, but I am uncertain whether a correct explanation of its cause was given by the chairman.

I will now give my own statement, which is based on facts which all members of the Society must know. The Council appointed a Committee (all the Council were appointed on it) to consider the expediency of altering the Articles of Association. (This I announced from the chair in October last.) This Committee reported to the Council at its November meeting, and one of their recommendations was that the articles should be so altered as to exclude the five senior members of Council from re-election. The Council, after considering the report, adopted this recommendation, together with others to which I need not allude. On certainly two if not on three occasions within a few years, a somewhat similar proposal has been brought forward, and as lately as when the Articles of Association were drawn up, was rejected, and the present freedom of election maintained. This freedom of election, entailing as it does the eligibility of any member of the Society for a seat on the Council, I have strongly advocated ever since the "house-list" system was abolished; for it appears to me to be contrary to reason to disqualify a member for the sole cause of having faithfully served the Society for a certain number of years. The rule, if made, would place such a disqualified member in the same position as a felon or bankrupt in a parliamentary election—a position which is scarcely desirable.

When a Council has, by the rules of a Society, to submit a "house-list," there is much to be said in favour of insisting that a certain amount of fresh blood should be included in it; but where the whole Council has to be annually nominated and elected by the members at large, any disqualification to some seems to me thoroughly wrong in principle. For a member to have won the confidence of the electors for several years in succession, will be pretty much akin to the shearing of Samson's locks. He will become apart for the Philistines.

The resolution having been adopted by the Council, it must of necessity come before a special meeting of the Society for approval; and, if I were President, it would be my duty to take the chair on that occasion. In the capacity of Chairman, I should have to sit passive (which might be taken that I was acquiescent), except when necessary to act as a moderator in the discussion, and to count the votes, which could not include my own, I believe. Holding the views on this question that I do, I felt that my only course, with due regard to self-respect and to the majority of the Council, was to resign, and thus make way for some one who was more sympathetic with them. It is true I was elected by the Society and not by the Council, and it may be thought that the resolution adopted by the latter was not sufficient reason for my resignation of the important office I held. Had the Articles of Association expressly allowed voting by voting papers on changes of constitution, as it does for the election of officers and Council, I should probably have remained, for I have but little doubt that I am in harmony with the majority of the Society. As, however, any change that may be made will be made according to the views of the majority in a meeting of seventy or eighty members, who happen from circumstances of residence to be able to attend, and which is a small proportion of the Society, I felt that any obligation to remain was cancelled.

The Articles of Association may not be faultless in more directions than in that I have just indicated, but it is better to leave them as they are than to be perpetually revising them. Perpetual tinkering at rules is subversive of the proper work of any Society. Personally, I have no spare time to devote to such a waste of energy. An hour's discussion of rules means an hour withdrawn from scientific work. If there were a real necessity for the change of rule, I would say nothing as to this waste of time; but as statistics show that the infusion of new blood into the Council, which some clamour for, is automatically taking place (being very little short, I believe, of the average of five a year), I protest against it being forced on busy members of the Society. If the change be made,

the infusion will be made at the expense of probably the most efficient and experienced members, instead of through natural causes.

Perhaps some way of testing the real feeling of the whole Society on this subject might be found at the approaching annual election of officers and Council, when every member can exercise his vote regardless of distance from London. If this can be done, I shall be glad; for what is wanted is not only an expression of opinion by the London members, but also by the country members of the Royal Photographic Society.—I am, yours, &c., W. DE W. ABNEY,

Late President of the Royal Photographic Society.

December 12, 1896.

P.S.—I find that Mr. Chapman Jones, the Hon. Secretary, has also resigned his office. I should like to state emphatically that he has acted quite independently of myself, and no doubt will give his own reasons for having done so.

To the EDITORS.

GENTLEMEN,—Although I was appointed the Hon. Secretary of the Royal Photographic Society by the Council of the Society, and technically, therefore, am responsible to them, I feel that I owe a duty to the members that can only be discharged by stating publicly why I have resigned that office.

I am not opposed to having a regular number of new members of Council at each annual election, indeed, I suggested that the number now adopted by the Council should be increased; but I regret that what I consider to be a harmful method of effecting the change has been carried by a majority of the Council, and that it has become my duty to make the most emphatic protest I can against the proposed method by placing my resignation in the hands of the Council. I have been told that this is a trivial matter, and not worthy of so emphatic a protest. A small hole in the embankment of a great reservoir is a very little thing, but if the directors by a majority determined to have a little hole, if only as an experiment, what would be the duty of the engineer? I cannot consent to take part in the carrying out of a resolution that is not unlikely to prove disastrous to the Society. This is the main and decisive reason of my resignation.

But I have also expressed to the Council my feeling that it is a great pity that the time and energy of the Society and its officers should be spent in such frequent and generally unnecessary alterations of the Society's rules, instead of devoting them to the work that the Society exists to do.

I wish to thank the members for the cordial assistance and sympathy that they have extended to me during my years of office. On resigning the Secretaryship I ceased to be a member of Council. The Council, however, elected me to a vacancy that existed, so that I shall continue to do the utmost that my position will allow to help forward the best interests of the Society.—I am, yours, &c., CHAPMAN JONES.

December 11, 1896.

P.S.—I have heard a rumour to the effect that I resigned at Captain Abney's desire or suggestion. Nothing could be further from the truth than this.

A PHENOMENON IN PRINTING.

To the EDITORS.

GENTLEMEN,—Some time ago I asked you to explain the reason of a white halo around dark outlines, but I have not received any satisfactory answer as yet. Here is another experience I have had lately, which I am unable to answer for. I have some 10 × 12 inch negatives of buildings which fill the plate more or less on account of height or width of buildings, allowing on the plates next-door houses of no account. These houses I want to eliminate while printing the negatives on ferro-prussiate paper, 14 × 17 inches in size. To obtain this and a white band all around the principal subject, I acted as follows:—

I pasted all around the 10 × 12 negative double thickness of a non-actinic yellow paper, leaving only in the centre the principal building. Now I take a printing frame 14 × 17 in which I put a glass. In the centre of this I lay my negative, and on top of this I put a black paper, 14 × 17, in the centre of which I have cut out a square piece of 9 × 11 inches more or less according to the reduction of the negative to be printed from. Over this I put my 14 × 17 piece of ferro-prussiate paper, some padding, and close it all up and expose to light. When finished and washed, I expect a picture in the centre, and a clear, white band all around. Not so, however, in practice. I obtain regularly a fine picture in the centre, but (and here is the trouble) a tinted rim, exactly the reproduction of the 10 × 12 negative, and all the remainder of the paper perfectly white. Why? If the paper is left between black paper and padding, why is it not left the same when between negative, yellow, and one black paper? Does strong pressure allow light to pass more than when lying loose, or does pressure alone make a print in this case, and through three sheets of non-actinic paper?

I would add, that the print from the negative itself shows clear whites in the high lights, and good deep blue in the shadows.—I am, yours, &c.,

A LEVY.

SCIENTIFIC INSTRUCTION AND THE PHOTOGRAPHIC PROFESSION.

To the EDITORS.

GENTLEMEN,—The long letter in your issue of the 11th inst. is altogether beside the mark of what I advocated, viz., practical application of the old adage, "*Knowledge is power;*" whether it be for an artist or a mechanic, a jeweller or a brass-worker, a cloth-weaver or a photographer. Knowledge of the nature and uses of the materials he employs in his craft, must enable the man to be a more skilled worker in his daily vocation.

If I were to desire a son of mine to take a high position as a photographer, I would place him with the photographer who turned out the best work in the town; who was not wise in his own conceit, and thought there was nothing to be learnt in the profession except what he already knew; one who aimed at excellence in results, and always demanded best pay for best work.

I would cause my son to give some time to the study of chemistry, and some to the study of "Art," pure and simple.

Fortunately, we have now in Birmingham ready means at very moderate cost, for the youth of the city to acquire knowledge in each of these departments, and in almost every other relating to "arts and crafts" practised in the city.

It is useless to say the photographer requires no knowledge of chemistry, "because he can buy his chemistry, ready made, in the market." It is this ignorance of the nature and application of the "materials" of his trade, which has been a cause of injury and loss to the workers in many of the trades in our country, and, *per contra*, the study and possession of this knowledge has given foreigners an advantage over ourselves.

The absurd *dilettanti* nonsense, stated in the letter, as my views, are not my ideas or wishes, nor have I advocated in any way the manufacture of exhausted book-worms, so I need not waste your space by explaining statements which I never made.

I do not advocate "theory," but "practice." I do not want "class" to displace the studio and the workshop. I have not stated that "polytechnic teaching has proved so exceedingly beneficial," but I have lamented the absence of something higher than "rule of thumb" in the arts and crafts of this country, a state of ignorance which we have only recently set ourselves to remove.

As to "profits," I have it on the highest possible authority from professional photographers of high standing, that they have always got best prices for best work, and it is in the power of the juniors and assistants to do the same.

I do not want to make invidious selections, but Messrs. Van der Weyde, Fall, Elliott, Byrne, Whitlock, Freke, Mendelssohn, and a host of others (whose names I trust I may be pardoned for not naming), will all support the views I have expressed in my previous letter and in this one.—I am, yours, &c., D. J. O'NEILL,

Secretary of the National Association of Professional Photographers.

47, *Charlotte-road, Birmingham, December* 14, 1896.

THE OWNERSHIP OF MEDALS.

To the EDITORS.

GENTLEMEN,—In the correspondence column of your last issue, there is a reply bearing on the ownership of medals. It appears to me a subject of vital interest to the profession.

Is it a fact that artists of the brush transmit to canvas their own ideas and are the authors of their work? If that is so, what is the position of a much be-medalled photographer whose talented assistant produces work which he, personally, is wholly incapable of producing beyond, perhaps, developing the plate?

As things are, the employer is considered a hero with honours, whilst the author of the work must not, on any consideration, be mentioned, and may not breathe the truth to any one without libelling the dignified holder of the medal.

We have Linked Rings and a Convention. Would it not be well for this subject to be taken up during the winter months by some of the societies, and a committee formed from them to prepare general rules, &c., which could be adopted and made to govern the present unhealthy and loose system?

Many will agree that honour should be given where it is due. We may some day have a Royal Academy of Photography, but not until these matters are properly adjusted.

Hoping my letter may not be out of sympathy, and thanking you in anticipation for bringing it before the profession,—I am, yours, &c.,

56, *St. Mary-street, Weymouth, December* 14, 1896. H. G. STEPHENS.

THE LATE R. KENNETT.

To the EDITORS.

GENTLEMEN,—I was very sorry to see recorded in THE BRITISH JOURNAL OF PHOTOGRAPHY of last Friday, the death of my old friend Mr. R. Kennett. Not only was he an enthusiastic worker, but he also invented several useful pieces of apparatus—his tripod legs are very simple and rigid, carrying great weights. I used some of his dry plates about thirty years ago with good results.

It may interest some of the younger practitioners to read that the very first plates made by Mr. Kennett were of great rapidity; he was under the impression that they could not be as sensitive as wet collodion, although his younger son, a good photographer, was always telling him they were too rapid, and he showed me that he could print on them with four thicknesses of red fabric over the negative. At last he came to the conclusion that his son was right. At one time, he was much worried how to get rid of the unnecessary salts in the emulsion, and he told me that he thought out the method in his sleep, showing how his mind was full of the subject. He was first-rate in his own business, and a very skilful worker at the lathe; a genial, well-informed man with whom it was both pleasant and profitable to spend a couple of hours, and one to be remembered by photographers.—I am, yours, &c., FRANK HAES.

December 13, 1896.

THE REAL TRUTH.

To the EDITORS.

GENTLEMEN,—In an editorial article last week, p. 786, at the head of the second column, you speak of the "real truth." I am so bothered. My old friend, "Junius Junior," used to teach me through your pages, and now that he is dead I have to turn to you.

The "real truth." Then, is there truth which is not real! Some leading men of thought suggest that somewhere there may exist a fourth dimension. Two and two may not always make four. So many difficulties would vanish if this could only be proved. It may be that it will be found in photography. Do you think so? I do. I meet with so many difficulties which nobody can explain. "Junius Junior" tried and died—two years ago.

Does "real truth" refer to the three known dimensions, and when the adjective is omitted does it refer to the fourth, or what? I get my English from the JOURNAL.—I am, youre, &c., RICHARD.

[Possibly "Junius Junior" may at some future date resume his contributions to our pages and answer our correspondent's question. Contrary to what "Richard" supposes, "Junius Junior" is not dead.—EDS.]

THE PHOTOGRAPHIC SALON.

To the EDITORS.

GENTLEMEN,—You draw me, of course. Because I take it that an opinion expressed by "Cosmos" is equivalent to the opinion of the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, and that you, Sir, therefore consider that the letters lately published in your columns demand replies from those who are attacked.

But am I to understand that whenever letters reflecting on others, written by no matter whom, whether from persons of importance or not, are published in the newspapers, silence on the part of those against whom the attacks are directed implies, as "Cosmos" says, that their "critics have left them, metaphorically speaking, without a leg to stand on?"

I beg to say that it is in no way because the letters are unanswerable that I have not, as you seem to expect I should have done, replied to them. There are occasions when one may safely leave such things to the unprejudiced judgment of the public, and this is one of them—if, indeed, which I doubt very much, the public cares to trouble itself about such trivial word-splitting.

With all deference to yourself, Sir, and "Cosmos," I am happy to believe that the opinion of the photographic world concerning the Salon is by no means one of "extensive disfavour," as asserted in "Jottings." I know that there are those who would shrink from no device to have us believe that this is the case; but the Salon can well afford to smile at such efforts, and, as a rule, refuse to notice them. I, myself, only do so now on account of what appears to me to be a call from yourself. About the merits of the correspondence I say nothing.

May I ask those who agree with the writer of the *Indian Photographic Society's Journal*, if they can state any instance to justify the use of such a phrase as you quote, viz., "If the Linked Ring will only give up its rather undignified appeals for flattery and commendation," &c.? Does this mean anything or nothing? By whom has it been done, and when? —I am, yours, &c., ALFRED MASKELL.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Edmund Eccles, Bury, Lancashire.—*Photograph of Rev. John Mather, Bury.*

Gilbert Wilson, West House, Grange-over-Sands.—*Photograph of Yewburrow Crags from the shore, Grange-over-Sands.*

Thomas Burns, 5, West Maitland-street, Edinburgh.—*Three photographs of the Rev. Thomas Harvey, and one photograph of Mrs. Harvey.*

Wilkinson & Co., 29, Rampant Horse-street, Norwich.—*Photograph of T.R.H. Prince and Princess Charles of Denmark in "Victoria."*

H. BARTHOLOMEW.—Thanks very much for the cutting, which will suffice.

FLASH.—We believe that Perken, Son, & Rayment, Hatton-garden, supply the form of lamp mentioned.

O. C. VANSTON.—Communicate with the superintendent of police of the locality where the man resides.

MERCURY-BLEACHED NEGATIVES. TYRO asks: "Will negatives bleached with mercury fade if I do not at once blacken them?"—In reply: No; the bleached image will not fade.

GILDING.—M. DE S. & Co. We believe the advertising tablets are gilded with gold leaf, applied at the back. We are not aware of any process for depositing the gold, as silver may be deposited.

A. SQUIBBS.—1. Probably what you take to be halation in the case of the wide-angle lens may be flare. We cannot otherwise account for the phenomenon. 2. We presume it is one of the Enryscope form working at *f*-5·6 (approximate).

STEREOSCOPY.—BEGINNER sends us some examples of his work in this branch of photography, and says that, when he looks at them in the stereoscope, he gets no effect. He asks the reason.—In reply: The prints have not been transposed in mounting.

COPYRIGHT DECISION.—G. & J. HALL ask: "Can you oblige by telling us copy of JOURNAL in which appears the copyright case, Nottage *versus* Jackson?"—The reports of this case, and the appeal, will be found on pp. 380, 392, 436, 453 of the volume for 1883.

EMULSION.—PERPLEXED. The reason why the proportion of silver bromide is greater in the one formula than the other is that their authors have different ideas on the subject. The chloride is to modify the colour of the slides; the quantity is that given in the formula. Other formulæ for bromide emulsion will be found on p. 976 of the ALMANAC.

THE FACTORY ACT.—MESSRS. WELLS & CO., write: "In your answers to correspondence of December 11, we notice you tell F. E. G. he can employ young persons from 9 to 6, or 8.30 to 7, every day of the week. We think this must be a mistake, as our abstract states young persons can only be employed on Saturdays from 6 to 2, or 7 to 3, or 8 to 4."

OLD CELLOIDINE PAPER.—M. PELLECHET (Paris) says: "I have some celloidine paper yellowed by age; could I not modify the toning bath (acetate of soda and gold, with some sulphocyanide) in order to lessen the yellow tint? I am sure I have read somewhere something about it, but cannot remember."—We know of no method by which the paper can be used so as to yield prints with pure whites.

LANTERN SLIDES.—G. E. B. says: "Can you inform me where I can procure lantern slides, or, if not these, prints of photographs taken from a balloon, of 'composite' photographs, of photographs illustrating combination printing, and of the well-known photograph of some object (such as a portrait of the Queen) taken through a fly's eye?"—Probably Mr. W. I. Chadwick, of 2, St. Mary's-street, Manchester, can give our correspondent the information required.

AN INDEX QUESTION.—CYMRO LLOYD says: "1. Will you please inform me on what dates have Mr. H. P. Robinson's works appeared on the subject, *Digressions*, &c., in your paper? I should like to have his work from beginning to end. 2. Also Mr. T. N. Armstrong on his subject, *Outdoor Studio Work*."—In reply: Mr. Robinson's articles appear in the JOURNAL published on the first Friday in each month. The Index to the volume will be published on January 1, 1897; this will give you all the information you require.

COMPARATIVE EXPOSURES.—H. FURNISS. It is impossible to give any reliable information on the relative exposures required on the data given, "A fine day in June" and "A thick and hazy day in December or January." Yours and your friend's argument can only be decided by experiment. Select a day that fulfils both your ideas as to "dull and hazy," and then expose a few plates, giving different times to each—giving, say, for the first ten times that you know was required on the fine June day, and longer for the others. Then compare the results.

STAINED PRINTS.—PERPLEXED PRINTER writes: "I enclose some prints showing stains, with which I have several times been troubled during the past two months. I always work in the same way, using the same dishes, &c., which are kept exclusively for toning and fixing. Monday, Tuesday, and to-day I have used the same toning bath. Monday and to-day my prints were all right, yesterday forty, out of a batch of nearly 200, were stained like the enclosed. Can you help me to account for it?"—The stains are caused by imperfect fixation. Either the fixing bath was too weak or the time allowed too short. When the hyposulphite solution is cold, a longer time must be allowed for its action. Probably this has not been the case during the time the trouble has been met with.

PRINTING NEGATIVES IN A GROUP.—S. JAMES says: "Could you inform me the best method for printing the following? I have thirty cabinet negatives to print from, which have to be arranged into a group, of course to be copied into a 12×10 negative (they are all full-length figures)."—There are many ways of doing this. Sometimes the prints are simply cut oval and mounted on an ornamental design, at others they are combined by arranging the full-length figures, after they have been cut round their outlines, as a group, and mounting them and then introducing a suitable background in water colour. This column is too limited to give practical details of the methods. Many articles on the subject will be found in back volumes. One on p. 82 of the volume for last year, for example.

CHRISTMAS HOLIDAYS.—*Will our correspondent's note that, in consequence of Christmas Day falling on Friday of next week, we shall publish a day earlier than usual!*

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EX CATHEDRA.

THE Photographers' Benevolent Association ceased to exist some time ago, although it has a considerable sum of money standing to its credit, upon which, however, a draw cannot be made without the sanction of the Registrar of Friendly Societies. The Benevolent died through the neglect of those for whom it was instituted. A well-known gentleman in the photographic world is, nevertheless, sanguine of being able to resuscitate the Association and probably will shortly make the effort to do so. We wish him success in his enterprise. There is, unfortunately, room for the Association, and, well supported by photographers and their assistants, it might be made an excellent agency for the relief of distress, and other desirable objects.

* * *

A FURTHER stage in the history of Mr. J. W. Bennetto's alleged "discovery" of photography in natural colours has been reached. The following announcement appears in our Newquay contemporary of December 18.

* * *

"COLOUR PHOTOGRAPHY.—On Tuesday last, December 15, at the Atlantic Hotel, a financial transaction in this matter was concluded, the details of which we are not permitted to divulge, except to say that, in our opinion, never before in Newquay has such an important (both historically and financially) business been conducted. It is, of course, public property, that a saloon carriage brought from London a party of well-known and distinguished persons from America and London to Newquay, to see Mr. Bennetto's work, and the result is that Mr John Wallace Bennetto, the once derided of that photographic luminary, THE BRITISH JOURNAL OF PHOTOGRAPHY, will shortly be receiving the hearty congratulations of his fellow-townsmen, and we trust that there will be no hanging back even on the part of those who, having not seen, have not believed. We are glad to authoritatively state that Mr. Bennetto will not be leaving Newquay. Many months ago, amid the sneers of our contemporaries, we congratulated Mr. Bennetto on his work, and now we are glad to congratulate him on having reached such a successful issue of his labours."

* * *

IT would appear from the foregoing that Mr. Bennetto has profited financially by his "colour photography" work, and we congratulate him upon his good fortune as sincerely as does the amusing little publication which so valiantly shields Mr. Bennetto from our "derision." The process having become the object of a financial transaction, we may assume that in due course some examples will be submitted to public, if not to expert, scrutiny. If the result of that scrutiny is to confirm Mr. Bennetto in his claim made on November 6 in our columns, that in his process he possesses "a jewel," we, as we have all along endeavoured to make plain, shall not withhold recognition of his achievements.

* * *

WRITING on the subject of acetylene burners, a correspondent gives the following hint: "Two or three weeks ago I noticed a correspondent inquiring if the light from acetylene would not be better for projecting purposes were the burners arranged with the flames at right angles to the condenser, as in an oil lantern. No one seems to have replied to him. I therefore write to inform him that burners so arranged are unsatisfactory. I have found the most satisfactory arrangement for lantern projection is to place three burners in an equilateral triangle with burners three quarters of an inch apart, the flames of the burners forming a triangle." We may remark that we ourselves have found the placing

of the burners at right angles to each other a perfectly satisfactory arrangement.

* * *

The sympathy of our readers will, we are sure, be extended to our friend Mr. G. Watmough Webster in the death of his wife, which took place suddenly, on the 14th instant, at Brook-lane Lodge, Chester. The deceased lady was a frequent attendant at the Convention, the Photographic Society *Soirées*, and similar gatherings. Her kind and amiable disposition had won for her wide esteem in the photographic world, wherein her death will be very much regretted.

* * *

In connexion with Cruft's Dog Show, at the Agricultural Hall, Islington, N., which is to be held in February, 1897, there will be an Exhibition of Canine Photography. A similar Exhibition held in the early part of this year was very successful.

THE CROSS-LINE SCREEN FOR ORDINARY COPYING.

All who have had much to do in the way of copying photographs, a branch of business that is by no means uncommon in the majority of studios, will be aware how difficult it is in most cases to secure a perfect, or even sometimes a moderately passable, result, owing partly to the irregularities in the surface of the original, and too frequently to its deficiency in detail either in the high lights or the shadows, which combine to rob the copy of its proper gradation.

On the other hand, those who are engaged in process work, or, for that matter, all who are in the habit of examining half-tone reproductions from photographs—and who at the present day is not?—must have noticed how, in the hands of a skilled operator, the reproduction is not only quite equal both in delicacy and in vigour to the original, but not unfrequently far superior, by reason of the power the screen gives of modifying or altogether altering the gradations of the subject to be copied; besides which, the grain or dot of the screen entirely hides or suppresses any texture or surface inequalities unless these be very pronounced indeed.

Bearing these facts in mind, it occurred to us some time ago that the cross-lined screen might prove useful to the ordinary photographer whose business does not include the production of process blocks or negatives, but who may possibly have frequent occasion to execute copies of old photographs of deceased relatives; and, upon putting the matter to the test with a variety of different styles of originals, we found that in every case, so far as delicacy, vigour, and gradation are concerned, it is possible to secure reproductions at least equal to the photograph copied, and, in the case of inferior or defective ones, actually far better. So far as the presence of the mechanical grain in the reproduction is concerned, if this be objectionable, which it need not be, it can be minimised by the employment of a sufficiently fine ruling, or practically can be done away with in the manner we shall indicate.

It may be urged at the outset that the ordinary photographer is not usually the possessor of a diamond-ruled screen, and that such are costly luxuries to be kept for occasional use for chance cases of copying, to which we reply that a half or even a whole-plate, diamond-ruled screen of the very best quality is not such a very expensive article, while for the purpose in question a cheaper collodion copy will answer just as well, provided it is fairly uniform in its grain; in fact, we have obtained very satisfactory results with collodion screens, which for actual process work would be perfectly useless, owing to the insufficient opacity of the lines.

The production of a perfect process negative, *i.e.*, one that possesses the requisite qualities for the formation of a printed image that will resist the etching acid, is a very different matter from the simple process of breaking up an ordinary half-tone image into dots to form a negative of sufficient density to print upon the usual modern printing papers. In the first case, the gradation of the picture depends upon a combination of circumstances, of which absolute opacity of the deposit and as nearly perfect clearness of the intervening spaces form only two, and these not the most important; but even these two may be comparatively ignored when the object is only to print a half-tone "dot" negative on ordinary paper. The function of the screen in the two instances is entirely different, and for the purpose we have in view it is simply to mask any inequalities of surface and to enable imperfect gradations in the original to be modified. In what way it performs these offices we shall endeavour to show.

First as regards the screen, we think that no coarser ruling than 133 or 140 lines to the inch will give really satisfactory results, especially for small work. With 120 lines to the inch, unless the quality of the negative is nearly as perfect as would be required for half-tone etching, the screen effect will be too pronounced in a cabinet-sized picture, though it may pass muster for whole-plate or larger sizes; but, with the rulings we have named, very good results can be obtained, even for *carte-de-visite* size. Although, as we have already hinted, the same skill in manipulation is not necessary as for process negatives, still a certain amount of care must be given to the adjustment of the screen distance and the size of stop, so far, at least, as to avoid a harsh and "screeny" effect. Thus the employment of a small stop with the screen in contact with the sensitive plate would result in a too perfect reproduction of the lines of the screen; whereas, by setting the screen farther away, and using a larger stop, the dot formation would be secured, and, if not in a sufficiently satisfactory manner to fulfil the requirements of the etchers, the needs of mere copying will be met.

But, if the screen grain be an objection, it may be almost entirely got rid of in the high lights, at least where it is the most likely to prove undesirable, by setting the screen at a sufficient distance, or by using a sufficiently large stop to entirely close up the dots in the high lights, and then to give a supplementary exposure with a smaller stop in order to get detail in the heavy shadows in the manner well known to process workers.

Ordinary gelatine plates may be employed; indeed, for the purpose, they are preferable to any other, since wet plates would entail more or less elaborate arrangements for separating the plate and screen, and, as regards special process plates, while their particular qualities are not of importance, they would entail a greatly increased exposure without any corresponding benefit. With the usual studio plate, the screen may usually be placed in contact with it in the ordinary dark slide, either single or double, the thickness of the cover glass being sufficient separation if a moderately small stop be used. If, however, this gives a too "screeny" effect, a mask or strip of cardboard or thin millboard may be used to secure greater separation, and the proper distance can be judged by inserting a sheet of ground glass in place of the sensitive plate, and examining the effect produced at different distances and with different stops. The same arrangement answers also for

focussing, for it must be borne in mind that there will be the thickness of screen *plus* the screen distance to allow for, if the ordinary focussing glass be used.

The exposure will be four or five times longer than would be required under similar conditions without the screen, and the development will be precisely the same as for an ordinary plate. In fact, in the dark room, it will be quite impossible, with the best eyesight, to detect any signs of the screens having been used. The image is watched and judged, for density and gradation, in exactly the same manner as if the screen had not been used, and, if any difference at all is made, it will be to carry density a little farther than under every-day circumstances, since the image, being more or less broken up into dots, and not homogeneous, allows proportionately more light to pass.

A few words may be said on the treatment of different kinds of subjects. If the original is perfect in gradation, no special departure from ordinary rules will be requisite. It will be desirable to bear in mind, however, that grey tones, whether platino or bromide, have a tendency to copy proportionately flatter than black or albumen purple, and that albumen shadows generally copy rather heavier than they appear, and bromides the reverse.

In the case of a harsh under-exposed print, in order to improve the result as far as possible, give what appears to be a sufficient exposure with a moderate-sized stop, say *f*-11 or *f*-16—that is to say, give four or five times the exposure that would be judged necessary to secure the best result possible without the screen. This will render the gradations of the general image, leaving the shadows still heavy. To overcome this defect, insert a smaller stop, say *f*-32 or *f*-40, and give a further exposure, judged according to the depth or heaviness of the shadows to be lightened. The second exposure will have little or no effect on the previous one, as it only superposes smaller dots on those already formed, while it allows any dark details in the shadows to creep up. If, however, the shadows are altogether devoid of detail, although it is impossible to supply this deficiency, the heavy mass may be lightened generally, and the *ensemble* of the picture improved. The best way of effecting this will be to give a short exposure with a small stop to a surface of white paper, by which means the shadows will be filled up with a shading of minute dots, while the gradations already formed will be practically unaffected, since, as in the previous case, the dots are superposed on others larger. But this auxiliary exposure must not be carried too far, or the shadows will appear flat; what is required is simply a shading of *very faint* dots which would be entirely useless to the etcher. It is here chiefly where the difference of the screen is found in making negatives for the two purposes.

In the case of an over-exposed or flat original, or one in which the high lights are wanting in detail, as short an exposure, with a moderately large stop, should be given as will just suffice for the lighter gradations of the picture, followed by a fuller auxiliary exposure with a small stop. In fact, *under-expose* with the large stop, and make up the deficiency with the small one, thus getting all the contrast possible, for the shadows, however flat, will necessarily suffer most in the primary exposure.

We have said sufficient to indicate the manner in which the lined screen can be utilised for modifying the gradations of the original image. This power is, of course, perfectly well known to the process worker, who makes constant use of it in his daily work; but it is of even greater utility where real half-tone printing is concerned, because the faintest indications of dots, that would be entirely eaten away in etching, are faithfully reproduced on the photographic paper.

In conclusion, it may be added that prints from such negatives in platinotype or on "platino-matt" bromide paper, make most charming imitations of half-tone etchings, though with this difference, that the delicacy and gradation are far superior for the reason already mentioned, that the half-tone paper renders the faintest detail produced in the camera, which is what the etcher cannot do. Some years ago it was proposed to make photographs in this manner in imitation of photo etchings, and we cannot do better than conclude by offering this suggestion for a new style of picture.

Objectionable Photographs.—On Saturday last a bookseller was committed for trial from the Marlborough-street Police Court for selling indecent photographs. A couple of detectives first purchased some of the photographs, and afterwards a number of others and some books were seized by the police. At one time a considerable trade was done in this class of work, but now, thanks to the vigilance of the police, or a decline in prurient taste, we are pleased to learn that the traffic in obscene photographs is almost stopped—we hope for the latter rather than the former reason.

Photography in the Argentine.—At the meeting of the Photographic Club, last week, several albums of photographs produced in the Argentine by Mr. A. S. Witcomb, of Buenos Ayres, were shown, and they were very fine. They were collotypes, which process, we believe, Mr. Witcomb works largely. We have since had an opportunity of examining these pictures, also some examples of portraiture, printed in collodio-chloride, shown at the Club a few weeks before, and we have no hesitation in saying that photography in the Argentine, as exemplified by Mr. Witcomb, has nothing to learn from the best photography here; even some of our highest-class workers might take a lesson. As to the collotypes, they are equal to the very best produced here, and far above the majority of the work issued commercially. Mr. Witcomb is an Englishman, but has long been located in Buenos Ayres.

Students' Work at the National Gallery.—The students at the National Gallery have just gained an important concession. Some time ago they petitioned the Committee for a means of exposing the copies they made from the old masters for sale in the building. The Committee, after duly considering the subject, have now decided to grant them the use of a room where their works can be exhibited for the purpose of sale. This will, no doubt, prove a great boon to many needy art students, who will probably realise a much better price for their productions if sold in the building than they could possibly expect from the picture dealers. This concession is no more than might be expected, seeing that the authorities have for years past permitted the sale of photographic copies of the pictures in the building, as well as giving facilities for their production.

Poisoned by Bichromate of Potash.—A woman died recently at Crewe from poisoning by bichromate of potash. It appears that she was given a recipe for a cough mixture which contained, amongst other things, bicarbonate of potash. The husband sent to a chemist's for it—its name being written on paper—but was supplied by an assistant with bichromate of potash instead; and this he used, thinking he had the right thing. The result was that the woman died. The parcel was not labelled "poison," and at the inquest the vendor said that bichromate of potash was not a scheduled poison; but the coroner remarked that the Act said that all poisons should be labelled, and intimated that the matter should be brought before the Pharmaceutical Society. It will be interesting to see what, if any, action it may take. We doubt if any photographic dealer would

supply two-pennyworth of bichromate of potash without labelling the packet "poison."

Another Projected Balloon Expedition to the North Pole.—When M. Andrée first announced his intended expedition to reach the Pole by means of a balloon, its success was looked upon with scepticism by scientists here. After all preparations were made, however, adverse conditions prevented a start being made till next year. Now, however, another expedition of a similar character is being projected in Paris. MM. Louis Godard and Edouard Turcouf announce that they intend to explore the Polar region in a monster balloon. Both gentlemen are said to be experienced aeronauts. The balloon is to hold between ten and eleven thousand cubic metres of pure hydrogen, and will have an ascending power of twelve thousand kilogrammes. The aeronauts calculate that with this balloon they will be able to remain in the air for forty days. However, they also intend to take with them a dozen vessels of compressed hydrogen, each containing two hundred and fifty cubic metres, suspended round the car, to fill up the balloon as required. These vessels are to be of equal weight to the ascensional force of the gas they contain. It is calculated, with this supplementary supply of gas, they will be able to remain above for sixty days. After this gas has been used, it is proposed to use the metal vessels as ballast. By the way, if any of this "ballast" happens to land on polar bears, it will not certainly prove good for the animals. The project is only in embryo as yet. Its estimated cost is 225,000 francs, and the money is not yet subscribed.

Acetylene Explosions.—As we briefly announced last week, there has been another fatal accident from acetylene; this time in Berlin, where four lives were lost. The details of the catastrophe to hand are very meagre. It seems that the use of acetylene is forbidden in Germany on account of its alleged dangerous character. It appears, however, that a chemist, Herr Isaac, had for some time past been experimenting with the material to deprive it of its dangerous nature. This he thought he had succeeded in doing, and had even demonstrated its "safety" before some high officials. On the day of the accident he was preparing to give a demonstration on a larger scale than hitherto before the head of the Imperial railways when the explosion occurred, blowing him and his three assistants to pieces.

A LATER telegram says that the Emperor has directed the Home Minister to investigate the matter and report to him. Herr Isaac, it is said, was shortly to have described his method of using acetylene to the Emperor himself. As all in the place at the time were killed outright, it is a little doubtful if much really reliable information will be forthcoming as to the immediate cause of the explosion. One thing, however, seems certain, namely, that the gas was compressed in a cylinder, as was that which exploded in Paris a few weeks back when two or more were killed and others injured. It seems pretty evident that, with our present knowledge of its properties, acetylene is very erratic in its behaviour, for, when a chemist has, as he thought, rendered it perfectly harmless, it scatters death all round. During the last few months acetylene has perhaps claimed more victims than has compressed oxygen since the time it was first introduced.

RESIDUES AND THEIR COLLECTION.

IT is not too much to say that, whilst during the summer the photographer is busy making negatives and printing, the winter too often is a time of enforced inaction, and it is then that there is time to look over one's negatives, to classify them, and generally clear up after the rush of work. Whilst the summer is the time of heavy work, it is the time of heavy residues, but there is no leisure to attend to them, and the only thing that can be done is to take care that they are collected as carefully as possible. In the old days of wet collodion and albumenised paper sensitised at home, the residues were valuable, but, when dry plates came in, and albumenised paper was bought ready prepared, the value of residues dropped. At the present time, when collodion and gelatino-chloride papers are more general, the residues should be valuable.

At least sixty per cent. of the silver used in the paper can be collected in the shape of residues if care is taken. The most of the silver is in the fixing bath, but the first washing water contains a good deal. If, as is sometimes the case, the first washing is performed either in a solution of carbonate of soda or salt, the soluble salts of silver are converted into insoluble carbonate or chloride, and then the whole of the residues may be in the fixing bath; in this case it is not worth while saving the first washing water. If, on the other hand, plain water can be used, it should certainly be collected, and, in order to precipitate the silver, it should be well acidulated with nitric acid, and then some hydrochloric acid added. Acid is preferable to salt unless care is taken not to add too much, for, if this is done, some, though a small quantity, of silver chloride will be dissolved. The washing waters will be, of course, rather plentiful, and very fair-size tubs must be used in order to collect them. In order to test whether the whole of the silver is precipitated, it is advisable to test a small quantity with a little pure hydrochloric acid, and, if no precipitate is formed, the whole of the silver is down. The chloride should then be collected and well washed till quite free from hydrochloric acid. If this is then dried, it should be kept separate and not mixed with the other residues, for it is fairly easy to reduce to the metallic state.

The reduction may be effected by means of zinc or magnesium, and either by the acid or alkaline method. For the latter, the chloride of silver may be merely made strongly alkaline with strong ammonia and water, and then fine granulated or filings of zinc added, when the silver will be precipitated. Almost a better method is to dissolve the silver chloride in ammonia; but this is costly, as regards ammonia, for it requires nearly seventy parts of ammonia to dissolve one part of chloride. Preferable to zinc is the use of powdered magnesium, which is considerably purer than zinc, and therefore the reduced silver does not afterwards require so much purification. If, in a fairly large vessel, sheets or bars of zinc are placed, in the proportion of about twenty-three parts of zinc to every hundred of silver chloride, and this then covered with a mixture of one part of ammonia to two parts water, and the silver chloride be suspended in a muslin bag, so as just to touch the liquid, the chloride of silver will gradually dissolve, and, in consequence of its greater specific gravity, will fall to the bottom, and there coming into contact with the zinc or magnesium, which may be used instead, will be reduced to the metallic state, and thus be obtained with the absolute certainty of not being at least mixed with unreduced silver chloride.

Instead of using ammonia the chloride of silver may be acidified with hydrochloric acid, and the silver will be reduced with zinc, and any zinc which is not decomposed may be dissolved out with dilute sulphuric acid.

If one has a silver dish, which, I must confess, is hardly a utensil that will be found in a photographic laboratory, and if an induction coil, or one or two Leclanché, Daniell, Grove, or Bunsen cells are handy, the chloride of silver may be placed in the dish, and covered with a saturated solution of sal ammoniac; the positive pole being placed in the solution, and the negative being attached to the dish itself, the chloride will be decomposed into metallic silver.

Müller suggested some years ago placing the silver chloride in a porcelain dish, covering it with dilute sulphuric acid and placing the negative pole of a Bunsen or Grove battery in the chloride of silver, whilst the positive is merely allowed to touch the liquid, when the silver will be deposited.

Old fixing baths should, of course, be collected whether of paper or plates, and the addition of hydroxylamine hydrochloride, and caustic soda solution, which can be obtained in an impure state commercially, will soon reduce the silver. The use of liver of sulphur, as the sulphydrate of potassium is known, is to be deprecated, unless it can be done out of doors. Far preferable to this is the use of zinc or magnesium powder, as no fumes are given off, and a tub under the developing sink will be out of the way and handy when the fixing bath gets dirty.

Paper clippings should be burnt, and the best method of doing this is to place the paper in a tin baking dish and burn from the top; if burnt, as usually recommended, in a flue, the draught is so great as to carry off some of the ashes. After burning, the ashes should be heated in a porcelain dish with about ten per cent. of sulphuric acid for about half an hour. This dissolves out all the carbonates of potash, &c., and then the residue should be washed and then treated with nitric acid, strong, with a moderate amount of heat, and the solution allowed to cool, filtered, and the silver precipitated in a pure state, and again dissolved in nitric acid or gold.

When we come to the combined toning and fixing baths, we have

solutions of silver with gold, and the process is more complicated. The best method of treating these and sulphocyanide baths is certainly to evaporate to a fairly small bulk, and to add about four times the bulk of concentrated solution of sulphate of iron—boil, collect the precipitate, wash and boil with nitric acid, which will dissolve any iron and silver and leave the gold behind. The silver may be precipitated as already described, and the gold well washed and redissolved in aqua regia to form chloride of gold.

The increased use of platinotype paper and the chloro-platinite of potassium as a toning agent should induce photographers to collect the residues. The developing solution contains all the chloro-platinite that is not reduced to metal to form the image, and it is only necessary to add sufficient ferrous sulphate solution to form ferrous oxalate to precipitate the whole of the platinum. Paper clippings should be merely reduced to ashes, and then treated with sulphuric acid to dissolve out the alkaline salts: then the residue redissolved in aqua regia to form platinic chloride, which can, of course, be converted into chloro-platinite.

It may be considered that the collection of residues is a troublesome process, and one not worth the game, too, in respect of cost, but during the winter months there is considerable time to spare, and the necessary outlay is small. A. D. Pretzl.

UNTIL NEXT SUMMER.

Falling leaves with chilly nights and mornings are unfailing reminders of fast-approaching winter, and of the prevalence of choking fogs, slush, discomfort, and bad light. *The* so-called season for photography has passed; cameras, lenses, and the odds and ends of the amateur's stock in trade are usually laid by until the ensuing summer, that, with its leafy glades and sparkling streams, will lure the photographer into a dalliance with art.

I am about to advocate a discontinuance of this shelving of apparatus during the winter, and so missing some of the most glorious chances that Nature affords us for picture-making. It goes without saying that during the winter there are many days in which it would be useless to try to photograph with any probability of success; but now and then, much more frequently than might be expected, breaks in the weather occur, giving us wonderful displays of light and shade that would be vainly looked for in the more genial summer time. The sun keeps low in the heavens, in this country at any rate, consequently the shadows are longer, and, owing to haze, which is seldom altogether absent, more picturesque effects are seen than in the warmer months of the year.

With respect to haze, a very little of it goes a long way. The light in the winter weather has less actinic power; a winter haze has therefore a more obstructive effect to sunshine than a summer one, a fact that has to be considered in photographing. I believe it was Artemus Ward who said, "You should never prophesy unless you know," but one might, I think, venture to hazard an opinion that, owing to the wet autumn, we shall have more than the average amount of fog and mist during the cold months, and we may also get some unusual picturesque effects, if we keep a look out, for dense mists in frosty weather mean hoar frost, affording us, perhaps, the most charming of all winter photographs. However, under any circumstances, the best plan is to be prepared in case of unusual or exceptional effects occurring.

We may divide the winter into three photographic sections, each supplying pictures that require special treatment. When we reluctantly leave our beds in response to the awakening rap and announcement of hot water, when getting up reminds us of getting into a cold bath, when the windows are crystallised all over with fancy foliage sparkling in the morning light, when the whole landscape is covered with a snowy mantle of the purest white, when voices and sounds seem isolated and float about without seeming connexion with solid bodies, when a good breakfast has been disposed of, we are then in a condition to appreciate the beauty provided for us on a perfect winter day, and should by rights be prepared to take advantage of it. If we, according to custom, have stored our traps for the winter, the trouble of getting them together, and filling the slides, &c., if we are lucky enough to have a stock of plates, will, in all probability, occupy just the best time of the day for work, and fill us with vain regrets that we were not prepared for the emergency, as quite perfect days for photography in winter are not very plentiful. The moral is, *Always* be prepared, for there is no telling what a day may bring forth, or how long suitable conditions may last when they do happen.

The most perfect snow scenes are those taken when the snow has recently fallen and appears feathery and light, with the sun shining from the side. The direction of the strongest light is very important. The kind of treatment for a snow scene is identical with the reproduction of shallow carvings on white marble, that is, we want the greatest possible contrasts, so that every inequality may be properly rendered without sacrificing the texture; this does not mean a hard, dense negative, printing black and white, but one possessing good contrasts, combined with good gradations. Many snow scenes are represented as if the snow consisted of solid chalk instead of the feathery masses of crystals lightly laid together that form its substance; in a short time it partially melts, losing its transparency and much of its beauty, so the proper time to secure our photographs is as soon as possible after it has fallen.

There are many things to contend with in making good snow negatives. As I have already said, the direction of the light is very important, every little shadow has to be made the most of, so that we can get the idea of depth and lightness, instead of solidity and weight. An under-exposed snow scene always fails in this respect, the gradation of tint in the lights being represented by solid opacity, and in the print by white paper. Over-exposure, on the other hand, means a weak, flat negative, that gives a dirty-looking print at best, entirely destroying the sparkle and pure effect of clean snow. Correct exposure is absolutely necessary, and this, owing to the limited experience most of us have in this particular direction, is the chief difficulty. Actinometers do not seem to be of much service in the work; it is true they give the value of the light, but there is something more wanted than a mere knowledge of the power of the light to succeed with snow. A sheet of white is very misleading, and, after being accustomed to the varied colours of autumn scenery, it is hard to think the exposure is so little different to it. Under-exposure, besides destroying modelling in the lights, renders the dark portions devoid of detail, which, in contrast with the snow, gives a *silhouette* appearance to those objects possessed of soundness and solidity. The piling on of density in trying to get out detail of course exaggerates this effect. Snow negatives should be *rather* thinner than other landscape work in order to reduce this extreme contrast.

There are other conditions adverse to success in this department. Not the least is the bad light and fogs that frequently prevail in snowy weather, especially in the neighbourhood of large towns. The finest work is undoubtedly produced when the sun shines clearly on the snow. The beautiful shadows produced are well worth the most careful attention. Nothing conduces so much to make snow look like snow in the picture than well-rendered cast shadows upon it. The shaded side of an inequality in the snow is quite of a different character to a cast shadow from some opaque object. It is as well to thoroughly realise this difference by careful *study* of the snow itself before proceeding to develop.

The protection of the lens by a surrounding hood from *all* light other than that forming the image is a *very* important precaution. The neglect of this tends perhaps as much as anything to make snow pictures flat, on account of the immense amount of light reflected from all points, often more from the ground than the sky. We all know what improvement is effected in ordinary photographs by the judicious use of a sky-shade. With snow we require the sky shade *all round* the lens. A contrivance like a black funnel projecting from the front of the camera is about the best form. If a pneumatic shutter is used, working in or behind the lens, the hood may be fixed to the lens itself, and will not require to project more than five or six inches in front; but, if a cap is used, the contrivance should be larger, so that the hand can be easily inserted without touching it; under all circumstances it must be sufficiently large to avoid cutting off any of the image. This must be carefully remembered when wide-angle lenses are used alternately with lenses of narrow angle. The use of an expanding hood, constructed of wire and black silk or other material, is a great advantage at all times in outdoor work, although especially so in snow scenes.

The *highest* lights on snow should be sufficiently dense to print without a tint; a difficulty sometimes experienced is in getting the snow to print lighter than the sky, and many discussions have been held on this point, the contention being that the sky, being the source of illumination, ought to be the lightest portion of the picture. The portion of sky *that appears in a picture* is frequently far less brightly illuminated than the snow, and is practically not the source of light so far as the picture is concerned; it is, on the contrary, very much lower in tone than the light reflected from the snow, that absorbs but little when the sun is at the side or behind the camera.

A well-lighted snow scene always has a sky darker than the snow, but, if it is falling snow, the particles, being more or less opaque, look darker than the sky, which acts as a background, the surface reflecting

the light being much less noticeable in the detached flakes as they slowly fall to the earth than as they lie massed upon it.

In prosecuting all winter photography, waterproof boots and leggings, with warm stockings, are advisable. A tramp for a few miles, ankle deep in snow, is, without adequate protection, a toil of a pleasure, for there is as much standing about, selecting the views, &c., as in summer, and health demands that one should keep dry and warm about the feet under these conditions.

Hoar frost is another winter subject more fleeting than snow, and rarely lasts long; in fact, so evanescent is it that in a few minutes its beauty may be gone. A slight breeze of warmer air causes it to vanish like magic. At other times it may last a day or two; but it rarely retains its best form more than a few hours. Lucky is the photographer who happens to be on the spot at the height of its beauty if he is prepared to secure it. Owing to its reflecting less light than snow, it is more easy to photograph. A mist is always required to produce it; it is as the mist clears off that it is seen in perfection, just as crystals look best after drawing off the mother liquor from which they have been deposited. The hoar frost has been crystallised out of the mist, adhering to anything offering a support, especially to the bare, rough branches of trees and other vegetation, an unattractive clump of sedge and dead stalks becomes, under the magic touch of hoar frost, a veritable fairy garden. No particular precautions are required in photographing it other than apply to snow; but, as it reflects rather less light, it requires *rather* longer exposure. In this, as with snow, the negatives must be somewhat thin than otherwise, and the most effective pictures are undoubtedly obtained when the sun shines from the side, although without sunshine very good results are also obtainable. Hoar-frost pictures will be always popular if good, as they make excellent enlargements, and look well on the lantern screen.

Ice forms the other division into which we have arbitrarily divided winter work. Ice itself, unless in large masses, such as were seen on the Thames a few years ago during the great frost, does not offer many attractions, except as a setting for skating scenes, &c.; very pretty and attractive pictures may be made, providing the light is clear and the sun shines. Some time since, I had in my possession a *wet-collodion* negative taken with an instantaneous exposure of a skating scene in the North of England, in which all the figures, some fifty or so, were sharp and full of detail; so now, with our more rapid plates and improved appliances, there should be no difficulty in securing good results.

The crystallised ice on window panes will make attractive pictures; providing dark screens are so placed that the pattern is thrown up into the strongest relief; a rather short exposure is generally best.

EDWARD DUNMORE.

THE PYRO-METOL DEVELOPER.

[Wilson's Photographic Magazine.]

SOME weeks ago I had a call to do a little street photography. The day was very far from being suitable for snap-shot work, but it had to be done then or not at all. It had been raining, so that the atmosphere was clear, but there was very little light. The lens I used will work at *f*-4, but, in order to get better distance, I used the stop *f*-8. It was with some fear that I entered my dark room to develop the plates, but I had the satisfaction of having them turn out all right. I attribute my success to a modified pyro or pyro-metol developer, which I have employed for some time past with general satisfaction. Those who have a little time to spare, and who are fond of trying a new thing once in a while, will possibly find these few notes of interest. In the following formula No. 1 is for use when it is desired to produce a strong negative; No. 2 is a milder form of the same; No. 3 is the usual alkali solution.

No. 1.

Water	8 ounces.
Metol	18 grains.
Sulphite of sodium (crystallised)	360 ,,
Pyro	22 ,,
Bromide of potassium	4 ,,
Citric acid	24 ,,

No. 2.

Water	8 ounces.
Metol	18 grains.
Sulphite of sodium (crystallised)	360 ,,
Pyro	22 ,,

No. 3.

Water	8 ounces.
Carbonate of potassium	1 ounce.

For use, take one part of No. 1 (or No. 2, according to the kind of negative desired) to one part of No. 3, and add one part of water.

I find that the above quantity of sulphite gives a slight tint, which produces an excellent printing negative, but, if you desire a grey negative, you can get it by increasing the quantity of sulphite. I think those who try it will like it. I have had better results with this formula, both under skylight and landscape, than with any developer I have ever used. You can modify the printing qualities of your negative to almost any extent by increasing or decreasing the quantity of sulphite.

JEX BARDWELL.

X-RAY EXPERIENCES.

To the amateur who would essay a venture into the worlds of mystery and science surrounding the theory and practice of Radiography, the advice of *Punch* would, as a rule, be most appropriate.

That this new art-science has come to stop, and that it will unquestionably become of the highest value, may be taken for granted. There is, again, no doubt whatever that a field, small, certainly, but fresh, is provided for those few men who may have made themselves competent for such work. In every hospital or infirmary of any size or importance there may be, in course of time, work in plenty for those able to perform special duties in connexion with X-ray investigations.

Already much that was written in connexion with this subject early in the year reads strangely. We had, it will be remembered, promises of "special editions" as any new fact came to light. Did any one radiograph a coin through his trousers pocket, or reveal the bones of his matutinal "kipper," the fact was recorded in a "special;" and some enthusiasts went so far as to say "they never had any failures," and, what is worse almost, put their names to it in full! Coils were at a premium, or, to be exact, were not to be had fast enough. "Now," as one maker remarked to me, "you can't give them away;" which is, no doubt, true in more ways than one.

We are not quite so cock-sure nowadays, and take our successes with due modesty and an air of mild surprise, as who should say, "Look at that, now; I wonder how *that* came about!" whilst our wives look on rather pityingly, and tell the children, "He (meaning the husband) is all right now, he has got something to play with."

Seriously, we may be thankful that, for the main part, the best work has been done by men who have been actuated by no private greed, but have freely published, discussed, and exhibited their results with the ready willingness of the real amateur. It might easily have been so different!

But I must get on with what I was about to say. It cannot be too often remarked that primary batteries are a great source of trouble, are most unreliable, and most expensive. Let no one of your readers imagine he will economise by investing in primaries. He will quickly find, in his determination to get results (unless, of course, staggered by the worry and outlay), he is spending as much as would provide him with a good accumulator.

Accumulators, let it be understood, are not quite the simple, innocent things some people imagine. It is not all plain sailing with them, and it will not always follow that "all you need do is use it for so many hours, then send it away to be recharged," which sounds very simple. My advice is, Don't have an accumulator unless you can yourself see to its "charging;" test the voltage and current, &c., and see that everything is in proper working order. The man who can use the main current is, of course, in luck's way, and, his mind relieved of one care, can devote his attention, all of which will be wanted, to other matters.

Tubes are still to be improved. I am not so sure about the size, but I think they would be better if made longer, the terminals somewhat further drawn out and more completely insulated. To prevent "sparking over" the tube, I have found the following simple plan to answer: cut two short lengths of quarter-inch glass tubing, and attach these with shellac or cement to each end of the tube over and around the terminals; the wires from the "secondary" pass, therefore, down an inch or so of tube before coming to the terminal.

Occasionally one finds, particularly with primary batteries, the fluorescence uneven and "flickering." This need not imply that X rays are not being formed; but I, for one, judge the working capacity of my tubes largely by the amount and evenness of the fluorescence. I find it an advantage sometimes to attach a *short* spiral of wire to the "anode" terminal of tube. This usually *steadies* the current and evens the fluorescence.

One focus tube I had, after giving some very sharp images, failed entirely in this respect, and gave shadowgraphs greatly varying. Sometimes there would be two or three shadows outlined as if the tube had been shifted. I found on examination the square platinum plate inside tube had become loose, it quite "shook" in its socket. This caused an oscillation during a tiny radius for the whole time of the exposure, and led, no doubt, to the want of sharpness complained of. I can account for it in no other way.

A tube suddenly becomes practically useless; the sparks play about outside perhaps, but fail to go through the tube. It is unsafe to overstrain your coil, and your three-inch tube appears to have become a six-inch! Increased vacuum, no doubt. Not only that, but I have noticed what I suspect to be a deposit of platinum on the inner surface of glass, just as, after long use, incandescent lamps get smoked with carbon. A.

tube in this depraved condition can be remedied by heat. This fact does not appear to be so well known as it might be. Make the tube as hot as possible over a spirit flame—until, in fact, it is too hot to hold—then pack away in a box of cotton-wool to cool. It will be found all right at next time of using, and I think, after several heatings, I notice a diminishing of the inner coating. This latter is, of course, mainly conjecture. I haven't broken a tube in order to make a minute examination.

Temperature is of particular importance. The work-room should be *dry* and fairly warm. I suppose there are no two opinions about this in the interests of *success*, to say nothing of personal comfort.

As to plates, is there any advantage in the use of *isochromatic* plates? I used them at starting, but gave them up for the most rapid plates to be had. One brand of colour-corrected plates I have certainly found better and more sensitive to X rays than any other. I have not found them so troublesome or difficult of development as might be supposed. Amidol and sulphite of soda, the usual solution, with a trace of bromide, is used. Use the smallest amount of red light, and canary screened. Place the plate in a dish of normal developer, cover it, and leave it. I have had one in this way for over an hour, and been gratified with quite fair and passable results, developed practically in darkness.

The use of a fluorescent screen makes all the difference sometimes between a rather thin negative and one of good and easy printing density. Dissolve the contents of a tube of potassium platino-cyanide (equal to thirty grains) in a drachm or less of water, and saturate therewith a piece of blotting-paper, $6\frac{1}{2} \times 4\frac{3}{4}$. Attach this, when dry, to a piece of cardboard of the same size. This makes a very fair screen for "backing up a plate," but I do not use a screen invariably.

We have had from time to time startling announcements relative to the effects on the skin and tissues of X rays. We don't hear enough of these cases. It is not too much to ask that they be investigated and reported upon, for, if while investigating the troubles of others we lay ourselves open to attack from an insidious enemy, the game will scarcely be worth the candle; but, in the mean time, I confess to a good deal of scepticism, merely advising all operators to keep their fingers out of the developing solutions. J. P. Nott.

SIMPSON'S PRINT-WASHING APPARATUS FOR PHOTOGRAPHIC PRINTS.

Mr. W. M. Simpson's invention consists of a tank in which trays are arranged horizontally, one above another, with a suitable space between each. The trays consist of a rectangular frame, across which tape is interlaced, so as to form a suitable lattice-work on which the prints to be washed are supported. One side of the frame is made of tube, preferably brass, of suitable substance. The other sides are made of stout wire, suitably bent, and attached to the tube at a short distance from each end thereof. Such attachment may conveniently be done by forming eyes at the ends of the wire, through which the ends of the tube pass, the eyes being soldered to the tube in such a manner as to leave about half an inch of tube projecting beyond the eye at each end.

Mr. Simpson says: "In one corner of the tank I place an upright supply pipe, having a row of holes along one side of it at a suitable distance apart, and in an adjacent corner of the tank I place an upright bearing piece, pierced with holes corresponding oppositely with those in the supply pipe. This bearing piece and also the supply pipe are suitably attached to the tank. The holes form bearings into which the short ends of the tubes are inserted. The ends of the tubes bearing in the supply pipe are left open, and the opposite ends are closed. Small jet holes are bored at intervals in the tubes in the direction of the plane of the frames. I provide suitable step pieces, or feet, to support the sides of the frame opposite to the tubes, so that the trays may be parallel to each other. These feet may conveniently be made as shown in fig. 3, where D is a blank of sheet metal, of which the wings, D, D, are to be bent as shown at the dotted lines. The slot, S, may conveniently be used for attaching the ends of the tape at the corners of the frame, and the flat part behind the slot forms a support for the foot of the next frame above.

"The frames are made each one a little larger than the one immediately below it, and the tank is preferably made wider in one direction at the top than at the bottom. The trays can be turned from a horizontal to a vertical position, turning in the bearings before mentioned. The action is as follows:—The prints to be washed are placed on the trays, beginning with the lowest tray. The other trays are in the vertical position while this is being done, and are turned down successively as required. Water is then turned on to the supply pipe, and thence, traversing the jet tubes, issues from the small jet holes and gradually fills the tank. When the tank is filled, there will be a constant circulation of water between each tray of prints. I provide a suitable overflow, which is preferably of syphon form, so as to draw off the water from the bottom of the tank, and, in the case of large tanks, I place an air tap or valve at the top of bend of syphon, so that, when the tap is closed, the syphon will act so as to empty the tank, but, when the tap is left open, the water will not sink below the level of the bend. In smaller tanks it is only necessary to pierce a small hole in the top of the bend. I sometimes modify the arrangement of jets and jet tubes by placing one or more jet tubes behind the series of trays in a vertical position, the jet holes being in such pipe or pipes so as to send a stream of water between each tray of prints. In this case the frames may be made of wire only, the ends being secured as by soldering into a short sleeve of metal, the bearings on which the frames turn being then placed within the frames.

"In the accompanying drawing fig. 1 shows the tank, of which two

FIG. 1

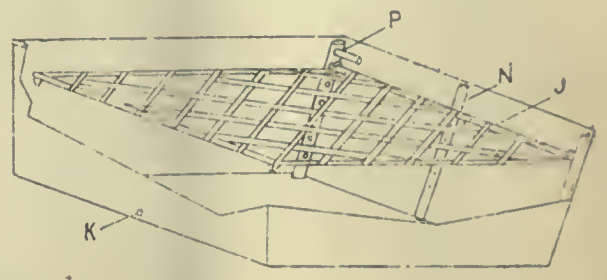


FIG 2

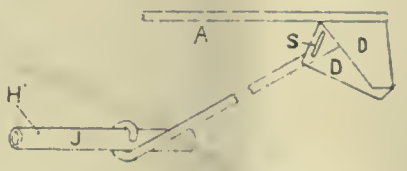
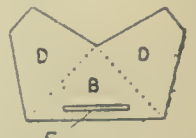


FIG 3



sides are partially cut away, with top tray in position. P is the supply pipe, J the jet tube, and N shows position of jet tube when placed behind trays, K the outlet for insertion of syphon.

"Fig. 2 shows foot attached to corner of frame, A; also attachment of frame to jet tube, J. H shows one of the jet holes.

"The claims are:—

"1. In an apparatus used for washing photographic prints, the arrangement of trays so mounted that they may be turned from a horizontal to a vertical position and *vice versâ*.

"2. The combination of jet tubes to form part of such trays.

"3. The combination of jet tubes with such trays so arranged when the jet tubes are placed behind the trays."

ELECTRIC LIGHT IN THE DARK ROOM.

It might, at first sight, seem to an outsider somewhat paradoxical that there should be any light at all in a dark room, but the intelligent amateur will immediately recognise that what is meant is the subdued red light required in the photographer's developing room, dark as regards actinic light, to enable him to see what he is about. This light, insignificant as it is, is a not by any means unimportant factor in the operator's comfort, if not in the success of his various operations, for it must be of the required quality and intensity, or it will spoil his materials, and it should be under his control, so that he may increase or diminish its brilliancy at will. It is, as regards this last qualification, that the majority of our dark-room lamps fall so far short of the ideal, for most of them will burn just as they like, high or low, or go out altogether, according as they are influenced by that mysterious something, not yet recognised by physicists, which influences the behaviour of inanimate objects. Gas is perhaps the best illuminant we possess, in this respect, but it has great disadvantages, arising chiefly from the heat it gives off, and products of combustion.

The incandescent electric lamp offers by far the most satisfactory means of supplying our developing tables with the necessary red light, in all respects but one, and that is the great difficulty there is in providing the electric power to light up the lamp, except, of course, in those cases where a beneficent vestry has provided the current, at so much per unit. But these cases are few and far between, so it falls to the lot of him who would revel in the delights of electric light in his dark room to find a means of producing his own electricity. Now, I have tried, I think, all the practicable ways of making the "subtle fluid" at home, and I have come to the conclusion that the best way of all is to buy it ready-made.

Secondary batteries, or accumulators, as they are often called, are devices which convert electrical energy into chemical action in such a manner that it is ready at a moment's notice to be converted back again into electricity. This is rather a crude explanation certainly, which probably would not bear strict examination by an electrician, but it is all right in spirit, and will serve our purpose. A secondary battery com-

posed of six cells will be the best for the purpose of the photographer, and such a battery, divided into two parts, so as to be more convenient for carrying about, can be easily procured, although, it must be confessed, at a cost considerably in excess of that usually paid for a dark-room lamp. Indeed, the expense of running an electric lamp in your red lantern being so very much in advance of the cost of paraffin or gas would be a very serious bar to its employment for the purpose, but that so very little is consumed that the extra expense which it involves cannot be weighed against its undoubted convenience and superiority.

This six-cell battery will have an electro-motive force of about twelve volts, that is to say, it will supply power enough, with a little to spare, to run a ten-volt lamp at high efficiency. A ten-volt "high efficiency battery lamp," as it is called, can be procured at about eighteen pence, and it will be as well to get two of them, so as not to be left, when the first one gives out, in the unenviable predicament in which, according to popular report, the patriarch Moses once found himself.

But it is not only as an illuminant for the red lamp that this electric light on a small scale is useful to the photographer. As a light for bromide printing, or lantern-slide making by contact, it is quite unequalled, for the ease with which it can be turned on or off at a moment's notice, coupled with the fact that, when the light is not burning, there is absolutely no glow whatever, as there is with gas that is turned low, make it invaluable for this class of work. Besides, from the moment when the newly charged battery is brought into requisition, to the time when it is so nearly exhausted that it is no longer advisable to use it further until it has been recharged, the quality of the light emitted by the lamp is practically constant, and this, it will readily be seen, is a most important factor.

One of the most attractive features of the light from the photographer's point of view is its ready amenability to any particular uses that his experience or ingenuity may suggest. Let me give an instance which will serve to suggest several similar cases in which the light will adapt itself to particular uses. I had a number of lantern slides to make by contact from various portions of rather large negatives, and I thought it would be a great convenience if I could illuminate the printing frame from below as it lay face downwards upon the table, so that I could see comfortably to place the sensitive plate in the right position upon the negative previous to exposure. I found a box that was about seven or eight inches deep, and of such a size that the printing frame, when placed upon it, fitted over it like a lid. In one side of this box a small hole was cut, in order that the battery wires could be conveniently passed through, and to these a small incandescent electric lamp was attached and wrapped up in orange-coloured paper. The printing frame rested on the top of the box, with the negative in position, and just before putting the sensitive plate in the place it was to occupy during exposure, the light was switched on for a few seconds, so that this operation could be accomplished in comfort and with accuracy.

Then, for developing, the light can be suspended from the ceiling so as to hang about a foot above the dish, and surrounded by a metal reflector that will concentrate the illumination upon the work in hand, and at the same time effectually prevent any of it reaching the eyes of the operator. Those who have been used to a red lamp placed in such a position that most of its rays stream right into their eyes can have little idea of the comfort which such an arrangement as that just described brings into the oftentimes tedious operation of developing. Not only can the process be better watched and controlled when all the light is shining upon the plate and none of it going to confuse and dazzle your eyes with its red glare, but a far greater amount of light can be used with impunity, for it need only be switched on for a second or two at first when the plate is in full possession of its sensitiveness, and can be turned out immediately that you have satisfied yourself that the developing solution is flowing evenly. Then, when the operation is reaching the critical stage, when it is of advantage to watch it carefully, and the plate is no longer so very sensitive, the light can be turned on in all its intensity until development is complete.

If it be preferred to use a weaker light during the earlier part of the development than that which is known to be harmless in the later stages, an artificial resistance can be included in the electrical circuit, which will have the effect of reducing the intensity of the light to, say, one-half, and this can be gradually shunted out as development proceeds, and the plate therefore grows less sensitive. Such a resistance is very easy to make. If the electric current that supplies the lamp be made to pass through a length of thin, tinned iron wire, such as the florists use for binding flowers into wreaths and bunches, it will be found to reduce the intensity of the light in proportion to the length of wire through which the current has to pass. The wire should be coiled up into a spiral, and that bent round into the form of a ring, so that a contact piece working from a central stud may be brought to touch it at any point, and you have a means of regulating the quantity of light to the greatest nicety. The energy which is thus prevented from transforming itself into light in the lamp will reappear as heat in this wire, but there will not be sufficient heat generated to do any damage or cause inconvenience.

The printing lamp may either be a suspended one, like that described for developing, in which case the printing frame would be laid on its back upon the table beneath it, or, if the box which I have described for lantern-slide work be adopted, a white lamp may be laid therein along side the red one, so that it is merely necessary to switch the current from one to the other after the lantern plate or bromide paper has been placed in position—a plan which has its obvious advantages, among which may be mentioned the fact that the printing frame may be made a fixture. Both these plans, however, have the disadvantage that the exposure must be made at one fixed distance from the source of light, and it is well known that it is decidedly desirable to be able to alter this printing distance according to the character and density of the negative to be printed. Hence it will perhaps be better to so arrange matters that the frame may be supported vertically at a variable distance from the lamp, and this may be well accomplished by standing the frame upon its side (to which end it might be fitted with a kind of baseboard), and fixing the lamp upright in a stand that can be placed in any required position.

It is better to have a separate switch for each lamp, and these should be placed far enough apart to obviate all risk of accidentally turning on the wrong light. A multiple switch with several contact points is not so good, because there is always the liability of placing the contact piece upon the wrong button, with the probable result of lighting up a white lamp instead of a red one, and thereby spoiling a plate. The best position for the switches and the resistance, if one be used, is just on the under side of the developing table, where they are quite out of the way, while, at the same time, they are within easy reach of the operator's hand.

With regard to the battery cells, no very special precautions are necessary, and, unless they are grossly ill-used, they will require no attention whatever until their charge of electricity is exhausted. Care must, of course, be taken that they are properly connected up in the first place, that is to say, the positive terminal of one cell must be attached to the negative terminal of the next, and so on, and they should stand upon insulating trays, so that there shall be no fear of leakage. It must be remembered that there is a supply of electricity in the battery waiting to get across from one terminal to the other, and only too glad of any opportunity to do so quickly with as little delay as possible. Consequently, great care must be observed that this opportunity is not provided, except through the legitimate channel of the lamp, for, if by accident a path through which the current can flow quickly be provided, it will immediately take full advantage of it, and, there being nothing to say it nay, as it were, it will rush across and exhaust itself in a very few minutes, doing the battery considerable, and often irreparable, damage at the same time. This is called "short-circuiting" the cells, and is usually brought about by allowing the wires from the terminals to come into contact with one another.

It is a good plan to take a hint from the electricians, who have to deal with heavier currents, and include in the circuit what they call a "fuse." This is simply a short piece of tin wire placed between one terminal of the battery and its wire connextion, and through which the current has to pass before it can by any means reach the other terminal. The tin wire is very thin, so that it will only just carry the amount of current that is wanted for the work in hand without getting hot, and, when this quantity of electricity is accidentally exceeded, the wire immediately becomes heated, melts, and drops out of its connexion, and so cuts the circuit effectually.

Secondary batteries or accumulators should never be used to complete exhaustion, as such a practice is exceedingly harmful to them, and shortens their life to a considerable extent. They should be recharged directly they show signs of weakness, that is to say, as soon as the lamps begin to yield a less brilliant light, they should be used no longer, and the battery taken to be charged before it is attempted to work from it again. The recharging only takes a few hours, and is not costly if you go to a fairly honest place, and, if care be used and the batteries taken to be charged as soon as they have arrived at that stage when it is no longer advisable to draw further current from them, they will keep for years, and work as well as when they were new. The length of time which they will run at a stretch depends entirely upon their size, and, if you say when purchasing what lamp or lamps you purpose running from them, you can buy a battery that will last for any given time before it will require recharging.

CECIL M. HEPWORTH.

IMPROVEMENTS IN PHOTOGRAPHIC DEVELOPERS.

MESSRS. LEMBACH & SCHLEICHER'S invention consists in the employment of hydrated oxy-quinolines and oxy-tolu-quinolines, and of their substitution products for developing photographic impressions in halogen silver containing media.

Heretofore, only those bodies have been known as organic developers from the aromatic series which contain in their essential structure at least two hydroxyl groups or at least two amido groups, or it may be hydroxyl and amido groups together. The substitutes are in this connexion either in the ortho or in the para position, whilst the meta-substitution products are wholly inoperative.

Of the quinoline series there have been heretofore proposed for use as photographic developers di-oxy-quinolines, di-amido-quinolines, and amido-oxy-quinolines which have, however, not till now come into general use in photographic work, because their complicated and tedious pro-

duction have rendered them too expensive, whilst their developing power is considerably less than that of the developers already in general use such as rodinal, eikenogen, methol, hydroquinone, pyrogallol, &c.

The fact, however, that hydrated oxy-quinolines have also the power of developing a photographic picture is entirely novel. It has been discovered that especially the tetra-hydro-compounds of the oxy-quinolines and oxy-tolu-quinolines, and also their "substitution" products (such, for example, as tetra-hydro-ana-bromine-o-oxy-quinoline) (O. Fischer and Renouf, *Berichte der Deutschen Chemischen Gesellschaft*, vol. xvii. p. 760); tetra-hydro-di-oxy-quinoline (Bayer and Homelke, *Berichte der Deutschen Chemischen Gesellschaft*, vol. xvi. p. 2217); tetra-hydro-ana-amido-o-oxy-quinoline; tetra-hydro-o-oxy-quinoline-ana-sulpho-acid; and tetra-hydro-o-oxy-quinoline carbo-acid (Schmidt and Engelmann, *Berichte der Deutschen Chemischen Gesellschaft*, vol. xx. p. 1219, and Heyden, *Berichte der Deutschen Chemischen Gesellschaft*, vol. xx. p. 443); are capable, by reason of their powerfully reducing properties, of furnishing photographic developers of high excellence which, even when diluted to the utmost conceivable extent, develop the latent photographic picture in a perfectly clear and extremely rapid manner and with sharpness of all details. Fogginess, such as is usually produced by over-developing, has not been observed with their use.

As compared with the substitution products of oxy-quinoline proposed by Auguste and Louis Lemière (*Jahrbuch für Photographie und Reproductions-technik*, 1892, p. 93) as photographic developers, these improved addition-products of oxy-quinoline or of oxy-tolu-quinoline have the great advantage that they possess a considerably greater developing power than the former, and that the developing solutions prepared from them are extremely durable and can be prepared in a very concentrated condition.

In addition to the aforesaid hydrated oxy-quinolines and oxy-tolu-quinolines, photographic developers of high excellence and great power are also constituted by the hydrides of the oxy-quinolines and oxy-tolu-quinolines, in substitution in quinoline-nitrogen, and also by the substances produced by the action of monochler-acetic-acid upon the hydrated oxy-quinolines and oxy-tolu-quinolines.

Of the substances coming in question in this connexion, the following may be mentioned :—

O-oxyhyro-methyl quinoline (O. Fischer, *Berichte der Deutschen Chemischen Gesellschaft*, vol. xvi. p. 714).

O-oxyhydro-ethylquinoline (O. Fischer, *Berichte der Deutschen Chemischen Gesellschaft*, vol. xvi. p. 717);

(Fischer and Renouf, *Berichte der Deutschen Chemischen Gesellschaft*, vol. xvii. p. 756.)

O-oxy-hydropropylquinoline (O. Fischer, *Berichte der Deutschen Chemischen Gesellschaft*, vol. xvi. p. 717).

O-oxy-hydro-butyl-quinoline (O. Fischer, *Berichte der Deutschen Chemischen Gesellschaft*, vol. xvi. p. 717).

O-oxyhydro-amyl-quinoline (O. Fischer, *Berichte der Deutschen Chemischen Gesellschaft*, vol. xvi. p. 717).

O-oxy-hydro-benzyl-quinoline (O. Fischer, *Berichte der Deutschen Chemischen Gesellschaft*, vol. xvi. p. 717).

O-oxy-hydro-phenyl-quinoline.

O-oxy-hydro-acetyl-quinoline.

O-oxy-hydro-benzoyl-quinoline.

O-oxy-hydro-methyl-quinoline-carbo-acid.

(Schmidt and Engelmann, *Berichte der Deutschen Chemischen Gesellschaft*, vol xx. p. 1219.)

Furthermore, the corresponding compounds of p-oxy-quinoline hydride and of the oxy-tolu-quinoline hydrides; and also the products of reaction of mono-chlor-acetic acid upon o-oxy-quinoline hydride (Kairocoll O. Fischer, *Berichte der Deutschen Chemischen Gesellschaft*, vol. xvi. p. 719); p-oxy-quinoline hydride and oxy-tolu-quinoline hydrides.

In order to prepare the developing solution from the aforesaid compounds, proceed as follows :—

Twenty-five grammes of neutral sodium sulphite and four grammes of caustic potash are dissolved with the aid of heat in 100 grammes of water, and to this are added ten grammes of tetra-hydro-o-oxy-quinoline or a corresponding amount of another of the aforesaid substances.

The claims are : 1. The use of hydrated oxy-quinolines and oxy-tolu-quinolines and also of their substitution products, in particular of the hydrides thereof in substitution in quinoline nitrogen, and also of the substances produced by the action of mono-chlor-acetic-acid upon the hydrated oxy-quinolines and oxy-tolu-quinolines for developing photographic pictures in halogen silver containing media.

2. A developer for photographic pictures which is prepared with the use of the substances mentioned in Claim 1, consisting of a solution of tetra-hydro-o-oxy-quinoline or of another of the before-mentioned substances, in an aqueous solution of neutral sodium sulphite and caustic potash, the concentrated durable solution thus produced being diluted with water before use.

STEREOSCOPIC PHOTOGRAPHS WITH TWO CAMERAS HAVING LENSES OF DIFFERENT TYPE AND FOCAL LENGTH.

[The Shashin Sowa.]

PERHAPS your readers have not all even heard of the very remarkable ice caves at Shoji, Yamanashi-ken, that is to say at the foot of Fuji-san on the side diametrically opposite Hakone. These caves, one of enormous size, are floored with ice, summer and winter, of such a depth that it has never yet been fathomed. During winter, water, dropping from the roof, produces wonderful and beautiful stalactitic and stalagmitic ice formations, which glisten and sparkle in the presence of any artificial light, no ray of daylight ever penetrating more than a little beyond the mouth of the great cave.

Photographs of the lower end of the cave, showing these strange ice shapes, have been made, using magnesium ribbon light, by myself and by several others, but single photographs, for some reason, fail utterly to give any impression of the remarkable effect produced on the eye.

I have frequently visited the ice caves, and have several times photographed the interior of the great cave, with varying success, but I soon recognised that any photograph, to give an idea of the place, must be stereoscopic. Last year Mr. Sydney Keith, an ardent amateur photographer, made stereoscopic exposures, but with what result I do not know, as he took his plates undeveloped back to England. I made an attempt myself with an inferior make of stereoscopic camera, but will not trouble your readers with a description of the reasons why the results were failures.

Early this year I was at Shoji with a friend, each of us having a hand camera. The cameras differed in type, and had lenses differing both in type and in focal length. One lens was an anastigmatic of five-and-a-half-inches focus, the other a rectilinear of four-and-three-quarters-inches focus. The former with a maximum aperture of *f*·6·3, the latter *f*-8. The only thing in common, so far as the two cameras were concerned, was that they were both for quarter-plates.

This gear—different cameras, different lenses of different focal lengths, each for a plate larger than stereoscopic size—could not be called very hopeful for stereoscopic work, and it was, indeed, only after some hesitation that we decided to attempt, with this very unpromising machinery, a stereoscopic effect. The supplement to coming number will, however, show that we met with a fair amount of success. The following is an exact description of the method used. The cameras were placed side by side, as nearly level as circumstances would permit, and, the lenses being stopped down to the same aperture (*f*-11), a large quantity of magnesium ribbon was burned at points behind, and at one side of, the cameras; ribbon to the length of about thirty yards, platted into torches, was burned for each exposure, of which three altogether were made. Development showed that one-third the quantity of ribbon would have been sufficient; but such moderate over-exposure could, of course, be easily rectified in development.

After the plates were developed, fixed, &c., the best one from each camera was selected, that from the camera with the longest focus lens was taken, certain fairly prominent points near each of the four edges were selected, and, lines being drawn through these, the limit of the picture was determined. The lines were drawn (actually scratched with a needle point) parallel to the edges, because it was known that the camera had not been canted sideways to any appreciable extent. The next thing was to draw a *corresponding* base line on the negatives taken with the shorter focus lens, which was, of course, on a smaller scale. This was a little difficult, as the camera with the shorter focus lens had been canted a little. It was necessary to select *two* points on the base line of the first negative, to find corresponding points on the second, and to draw a line through them. It was then easy to draw the top line, it being, of course, parallel with the bottom line, and through a corresponding point.

The side lines present a complication. In a pair of prints mounted for the stereoscope, that to be seen by the *right eye* should show a little more subject at the *left* side than at the right, and *vice versâ* as regards the *right side*, and as regards the print to be seen by the *left eye*. The object is to give the impression of an opening in the mount *through* which the object is seen. The amount of difference might be calculated mathematically were all factors, such as distances of objects, focal length of lenses (both of the camera and of the stereoscopic), &c., known, but it is usually determined empirically. About one-eighth of an inch will be found to give a good effect. In the case in question, allowance was made on the negatives, *right side* being substituted for the *left side* given above, and *vice versâ*, and the allowances were made proportionate to the sizes of the images.

Transparencies were now made in the camera from each of the two negatives, the size being reduced to stereoscopic size, and the greatest care being taken, using a pair of hair dividers, to observe that the transparencies, from negatives of different scales were reduced to precisely the same scale, and that the transparencies were of the same density (though the negatives were not). The transparencies were then mounted on a sheet of patent plate, taking care that that representing the right-hand image was to the right, that representing the left-hand image to the left. From this double transparency there was then made, by contact, a double negative, from which prints could be made direct. The half-tones have suffered somewhat from the repeated operation of negative to positive, positive to negative, and once more negative to positive, but it will be seen that the stereoscopic effect is perfectly retained. Indeed, it is somewhat exaggerated, because the axes of the cameras could not be get nearer to each other than four and a half inches, whereas, for true stereoscopic effect, they should not be more than about two and three-quarters of an inch apart.

It might be supposed that reducing the size of the negatives as described would counteract this exaggeration, but this is not the case. The distance apart of the cameras, when the negatives are first taken, absolutely fixes the amount of "stereoscoposity" (if the word will pass), no after alteration in size having any power to alter it.

W. K. Burton.

[With such a slight difference in the foci of the lenses of the two cameras employed, we should expect passably good results to be obtained; but the use of *one* camera moved laterally the requisite distance would have given perfect results.—Ed.]

PHOTOGRAPHY IN RELATION TO ART.

[Dulwich Photographic Society.]

The subject about which I venture to address you to-night is one of unquestionable interest. It should be of interest, in the first place, to all who follow the cult of the camera, but especially to those who have acquired, by study and practice, a knowledge of its manipulation. More particularly is this so as respects those who have acquired a competent acquaintance with those theoretic and scientific developments which have done so much to place photography in the advanced position to which it has now admittedly attained. It has been urged by some that photography is rather mechanical than artistic; that the potentialities of light—not always that evolved by the direct action of the sun—have been simply utilised by mechanical contrivances, supplemented by chemical accessories, and that the picture produced upon the plate is the result of mere skill, such as may be and is habitually employed in connexion with many industrial avocations. Indeed, it has been said that it requires as much aptitude or skill to make a good glass-blower as to make a good photographer. No doubt, there is a substratum of truth in this contention.

No one, I take it, will dispute as to the fact that all that is necessary to obtain a picture by means of the photographic camera is the possession by the operator of a mastery of certain practical details, and of facility in their use. Given this, he is able to effect a more or less truthful reproduction of such object or objects as he may desire to make the subject of his portraiture. But, granting this, if the operator has no higher qualifications, he is nothing more than a neophyte, he is nothing more than a waiter at the gates opening to a nobler and more august interior, in which the brighter trophies of photography are enshrined. It is when photography is associated with art that a spirit of life and divinity is, so to speak, infused, which enhances its beauty, and invests it with a power to seize upon the richest faculties of our nature. If you will allow me, I would compare photography to a marble statue—lovely in its immobility, but it breathes not, it moves not, it is without a soul, and its stillness is almost oppressive. Now comes Art, with its glorious baptism. Behold, it breathes, it moves, it is no longer without a soul.

For a marvellous change has taken place, and so evident is this that no one can fail to observe it. Let the work of an operator, who has no knowledge or care for the artistic, be compared—even where the same subject is in question—with that of a photographer who has, as it were, combined the illumination of art with the light of day, and the merest tyro cannot fail to discern, though he may not be in terms able to explain, the subtle difference that recommends the contribution of the atter to his preference. The reason for this is not far to seek. It is because the first appeals only to the eye, whereas the second appeals to the heart as well as to the eye.

I will go so far as to assert that, where the artistic appreciation is absent, the photographic operator can never produce really superior or truly meritorious results. Of course, all men are not endowed equally by Nature with what I have described as artistic appreciation, and only a few have it in the higher degrees; but most people have it in some modified sense, and no operator should, in my opinion, bring his camera into requisition without recognising the importance of its application in everything that he does.

It may be asked: "How and in what way may such artistic appreciation be expected to manifest itself in the practical use of the camera?" Obviously, the first consideration has respect to the selection of the subject. A photographer, with the slightest artistic appreciation, would, for instance, refrain from wasting his time or his plates upon the reproduction of some of the objects and subjects which, with apparent expectation of praise, are occasionally submitted for our critical approbation, with no better claim than that the outlines of the picture are sharply defined, the toning excellent, and the surface as exquisitely glazed as a newly starched and carefully ironed shirt-front. As specimens of mechanical photography, such productions may, and, in fact, do, attribute manipulative merit to the operator, nor is it my design to undervalue the importance of proficiency in execution; without such proficiency artistic appreciation would be of no avail. Without extraordinary and facile skill in the use of his paints and his pigments, his pencil and his brush, and the other instrumentalities of his grand craft, not all the powers of a Rubens or a Michael Angelo could have given to mankind the magnificent creations of his transcendant genius. And so no one, without proficiency in the use of his camera, and with a perfect knowledge of all the accessory processes, though the flame of art may burn brightly within him, can hope to excel in photography, or offer anything to the public worthy of taking a conspicuous place in the gallery of its proudest achievements. I do not, however, agree with some who have gone farther, and have insisted that the photographer should make himself quite familiar with the scientific value of all the elements brought into service in connexion with the production of the photographic picture. To begin with, it would be to place too heavy a burden upon the shoulders of the photographer, because light is essential, to require from him a solution of problems with regard to that substance—by the way, is it a substance?—which are yet undetermined, and may remain so for centuries to come. Nevertheless, it is desirable, though not absolutely necessary, that the photographer should know, not only the effects produced by the elements he employs, but also some of the reasons why such effects are brought about.

But to return. I repeat that the initial link which binds photography in its relation to art is in the selection of a suitable subject—that is to say, a subject which presents those features which please the eye and content the mind—features that, as with a seraph's finger, strike the golden strings in our inmost being, and awaken to exquisite vibration the poetical and artistic emotions of the soul. At the recent Exhibition of our Society I noticed a number of very admirable photographs, the subjects of which, in my opinion, testify to the existence of much artistic appreciation in their selection.

The experienced photographer, when he goes afield with his camera, fully equipped, is like a veteran soldier when in action, who does not waste his ammunition. In like manner, he uses his camera with cautious discrimination, and patiently holds himself in reserve for something worth taking. Nothing should escape his vigilant observation, and, when he meets—as he not unfrequently does, quite unexpectedly—with some choice "bit" of scenery, or with some attractive and pretty phase of rural or urban life, he loses no time in adding it to his collection.

Here, again, artistic appreciation is of consequence. A subject may have artistic value, but much will depend on the point of view from which it is regarded. Many a truly artistic subject has been virtually despoiled of its beauty by lack of artistic appreciation or inattention to this primary, I had almost said elementary, precaution. The best point of view is by no means evident at a mere casual glance. I am speaking in the presence of experienced photographers, and I am sure that they will not dissent from this. Another matter is material, namely, to exclude, as much as possible, from the picture all inartistic surroundings.

We have now a subject artistically selected, taken from its most artistic and effective point of view. But the relation of art to photography is not ended here. It follows the evolution of the picture throughout all its progressive stages until completion, and a comparison of the perfected production with the first print from the negative will often show us in how large a degree the technique of photography has been made subservient to artistic requisition. A good photograph should be well mounted and framed. The artistic temperament finds further opportunity of demonstration in the choice of materials harmonising in colour, and form, and decoration with the character of the subject. This is not so insignificant a thing as some people might imagine. There would be, for example, evident incongruity in placing a picture representing some scene associated with solemn and sombre memories in a brightly gilded frame.

I have not attempted to institute any comparison between the photographer and the painter. This has already been done by Mr. A. C. Payne, in an interesting paper read by him before this Society some time ago. The photographer and the painter move in their several orbits, and, without desiring to provoke controversy, I may be permitted to add, that each can claim for his own art points of superior excellence. In painting much is left to the imagination. Much is suggested rather than expressed. In photography, on the contrary, there is a microscopic fidelity to detail which leaves little to the imagination, and the only allocation of emphasis is that which, within narrow limits, can be procured by focal adjustments. The photographer is chained in fetters—but fetters of light—to the physical and the visible. Not so the painter. His thoughts may soar, on the wings of inspiration, into realms beyond the faculty of vision, and his greatest triumphs are often the intangible and ethereal creation of his own genius.

From an artistic point of view photography suffers from the absence of colour. The forms of Nature can be reproduced and fixed in the photographic picture, but the varied tints which grace and beautify them are wanting. Here the painter has an advantage, the importance and value of which it would be difficult to exaggerate. Whether it will be allowed to remain only time can determine. Certain it is that efforts have been made, and are still being made, to endow the photographic picture with the very colours and tints of the original. Something in this direction has been already accomplished, and several of the cardinal colours have, I understand, been reproduced, but it is objected that they soon fade and become obliterated. Nevertheless, so persistent are the investigations and experiments to achieve this object that, if attainable, this grand result will eventually be compassed. In such case, photography will prefer a new claim upon mankind. As a sort of make-shift—though a very good one—the crystoleum process has been invented, by

means of which coloured photographs are produced, some of them of highly meritorious character. At our recent Exhibition several most excellent examples were shown, though not for competition, and attracted considerable attention. Here we have "photography in relation to art" more closely united than previously had been possible, and it must be conceded that, in the development and application of this system, there is wider scope for the utilisation of the artistic faculties. A crystoleum photograph, when well and carefully—above all, when artistically executed—affords the nearest approach we yet have to a reproduction of the effects of Nature as she is, dight in the varied hues that make us love her so.

It has not been my purpose to-night to make a long discourse, or to burden what I had to say to you by technical details. Rather, it has been my object to submit to you the views of one who, without claiming himself to have deeply studied the science of photography, has a genuine admiration of the grand work it has achieved, with a sincere conviction that it has before it a noble future. I knew of no occupation which presents so many attractions to the lover of the open country. The practice of photography invites its votaries to health-giving and agreeable excursions from smoke-begrimed cities and towns into those more pleasant and brighter scenes, where the air is pure, and the eye is refreshed by the thousand-and-one aspects of loveliness which speak so softly and woolingly to the heart and the enthusiasm of the lover of Nature. In search of the picturesque and beautiful, with his camera as a companion, the photographer enjoys communion with her, not only where she submits herself to the gaze of every casual observer, but in those places where she seeks retirement from the common inspection, and not unfrequently presents herself arrayed in her choicest charms. Rightly regarded, photography is undoubtedly one of the most innocent, refining, and salutary of pursuits, and, when it is invested with the halo of art, it may fairly claim to receive the recognition and approval of the whole world.

CHARLES DUNLOP.

The Inquirer.

**** *In this column we from time to time print questions that may be addressed to individual contributors to our pages, or such as are sent to us with the view of eliciting information from a variety of sources. We invite the co-operation of our readers in rendering this feature of the* JOURNAL *useful and instructive.*

PITS.—A. LEVY writes: "In answer to Inquirer, 'Pits in Gelatine Films,' p. 810: They can be very easily cured (see last paragraph, p. 654 in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1897). It is the quickest and safest remedy, and cheapest."

WARM-TONED LANTERN SLIDES.—An experiment of my own seems to afford evidence that the deposit produced by the usual process of prolonged exposure and slow development with a developer containing ammonium chloride is, even after fixation, *still sensitive to light*. A red-toned slide, during prolonged exposure to daylight, changed first to a lilac tone, and finally to purple; it behaved, in fact, very similarly to an image formed in chloride of silver. Can any one throw any light upon this subject, or give references to the researches of any well-known authorities?—C. W. P.

ACTION OF SALT. (To "Cum Grano").—With regard to the action of a bath of salt in removing stain, if the so-called stain is really surface fog, due either to the use of an unsafe light during development or to the employment of too powerful a developer, then I see no reason to doubt the inaccuracy of your friend's statement. If a little developer is retained in the film, such fog is removed to a great extent by a bath of bromide applied before fixation (though at the expense of some of the finer shadow details), and also by a solution of iodide; a chloride probably has a similar effect, though I have not tried it. If hydrochloric acid is added to sodium sulphite, sodium chloride is formed, and, if the mixture is added to the hypo solution, a fixing bath is produced, which acts as a powerful reducer of density, and also removes surface fog. A plain solution of salt added to the hypo will probably have the same effect, and so also may a solution of bromide. Iodide has a powerful effect. The explanation is probably as follows: Metallic silver is reduced from a subhaloid salt of silver, either by the developer, or by the fixing bath. If a bath of a haloid salt is applied before fixation, the slight amount of developer retained in the film continues to reduce metal, which, by interacting with the soluble haloid while in a nascent state, is converted into an irreducible normal haloid silver salt, soluble in hypo. If the soluble haloid is added to the hypo, a similar effect takes place, the nascent silver being in this case produced by the action of the hypo. Stain, if co-existent with surface fog, may possibly be rendered colourless, or perhaps removed, by interaction with the alkali produced by the decomposition of the soluble haloid.

THE effect of salt in hardening the gelatine is probably more apparent than real. Possibly it prevents frilling, but the manner in which it does so cannot be satisfactorily explained. As is well known, it prevents the appearance of blisters in albumen paper. I have used bromides for removing surface fog before fixation, but cannot recommend them, excepting under special circumstances, as they undoubtedly have a deleterious effect on the details. Chlorides may be less objectionable in this respect. —C. WELBORNE PIPER.

Our Editorial Table.

PHOTOGRAPHIC MOSAICS, 1897.

Edited by E. L. WILSON. New York: Edward & Wilson.

Mosaics for 1897 does Mr. Wilson very great credit in several respects. It is beautifully printed, and the illustrations, of which there are nearly forty, are mostly half-tone blocks of good quality, made from good originals. American portraiture of the commercial kind would appear, from the examples here reproduced, to be quite the equal of British work. The Editor prefaces the book with an able and lengthy review of practical photography in 1896, and there are many original articles by, among others, Falk, Dr. J. Nicol, W. H. Sherman, Victor Schumann, Dresser, Eder, Jas. F. Ryder, C. W. Motes, G. L. Hurd, and W. T. Wilkinson. We have turned over the pages of *Photographic Mosaics* with genuine pleasure. It is an elegant book.

WYNNE'S INFALLIBLE PRINT METER.

The Infallible Exposure Meter Company, Wrexham.

THIS little instrument utilises the principle that a series of numerals graduated in density can be used in conjunction with sensitive silver paper to arrive at the time requisite to produce prints by the carbon, platinum, and other processes. It consists of a neat little metal case glazed with opal, at the back of which is a plate on which the numerals and letters are impressed. Contact is made with a piece of print-out paper, which is placed in the back of the meter. It is a handy system for arriving at the exact time of printing required in carbon, platinum, and ferro-prussiate paper work. The Infallible Print Meter should be found in the printing room of the amateur and professional.

THE "TEAR-OFF" TOURISTS' CALENDARS.

T. C. König & Ebhardt, 14, Billiter-street, E.C.

MESSRS. KÖNIG have sent us specimens of their daily "tear-off" tourists' calendars. Each leaf, besides the date, bears a pleasing view in half-tone. Being attractively got up, the calendars are ornamental as well as useful, and are therefore assured of a double welcome.

RÖNTGEN RAYS AND PHENOMENA OF THE ANODE AND CATHODE.

By E. P. THOMPSON, M.E. London: E. & F. N. Spon, 125, Strand.

DR. THOMPSON, in his preface to this painstaking volume, thus outlines its objects: "In addition to the illustrated feature for exhibiting the nature and practical application of the X rays, and for simplifying the descriptions, the book involves the disclosure of the facts and principles relating to the phenomena occurring between and around charged electrodes, separated by different gaseous media at various pressures. The specific aim is the treatment of the radiant energy developed within and from a discharge tube, the only source of X rays." The first six chapters of the work detail what was known of these interesting phenomena prior to the publication of Röntgen's paper. The subsequent record of experimental work published in the scientific papers since January last is very complete. Terseness characterises the compilation, which is in paragraphic form, with cross references. There are many excellent illustrations. The book is perhaps the most trustworthy record of the phenomena of anode and cathode rays that has appeared, and its value will, doubtless, be admitted by scientific men.

Convention Photographs.

By A. W. Westrop, Camden Lodge, Bridgnorth.

Many of our readers, who are also frequenters of the Convention meetings, are kind enough from time to time to send us photographic mementoes of these pleasant annual reunions. Naturally, we attach a special value to them. The most recent addition to this pleasing list is Mr. A. W. Westrop, a very able stereoscopic worker, who is good enough to send us some binocular photographs taken at Shrewsbury and Leeds. Some fine hoar-frost studies are also included. Mr. Westrop is *facile princeps* in this branch of work.

News and Notes.

Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, December 30. Travellers' Night. The subject will be *Woodland Studies*, with lantern illustrations by Mr. Fred H. Evans. Visitors are welcome.

The Camera in the Camp.—In the course of a speech delivered to officers of the Royal West Surrey Regiment, on the 12th inst., Mr. Hector Maclean dwelt upon the growing utility of the camera in military reconnaissance, and suggested that a short lecture, followed by a brief course of instruction, directed, not to enabling them to amuse themselves with a camera, but teaching them to apply photography to their military duties connected with reconnoitring, would be advantageous. The suggestion elicited loud applause, and there is considerable chance that early in the new year some such a course of study as above sketched will be initiated.

Borough Polytechnic Photographic Society.—The Second Annual Exhibition will he held at the Borough Polytechnic Institute, 103, Borough-road, S.E., on Tuesday, Wednesday, Thursday, Friday, and Saturday, December 29, 30, 31, 1896, and January 1 and 2, 1897, from 7 to 10.30 p.m. Lantern entertainments every evening at 8.30 o'clock. Tuesday, "English Lakes," Mr. John A. Hodges, F.R.P.S.; Wednesday, "Some Applications of Photography," Mr. E. J. Wall, F.R.P.S.; Thursday, a set of slides from negatives taken by members of the Society during the last summer outings; Friday, "Under the Broad Skies," Lieut.-Col. J. Gale; Saturday, a set of slides illustrating "Jameson's Dash to the Transvaal." Animated photographs and demonstrations of Radiography (Röntgen's X rays) will also be shown each evening.

The Salon.—The following extract from the *Journal of the Photographic Society of India* is not without interest in connexion with recent correspondence in our pages:—"The most noticeable and least pleasant feature of the catalogues, however, is the egotism of the 'Ring.' Just observe these figures, and consider which institution, by its modesty and patriotism combined, deserves to be the National Society. At the Royal Photographic Society there are 354 frames altogether. These are made up of: 338 frames sent in by 143 British exhibitors; 18 frames sent in by 18 foreign exhibitors. At the Salon there are 342 frames altogether, and these are contributed as follows: 249 frames by 94 British exhibitors; 93 frames by 34 foreign exhibitors. Looking further into the lists, we find that comparatively little distinction can be observed between members and non-members as to their acceptability at the Pall Mall Gallery (in fact, non-members head the list of the most favoured exhibitors), while at the Salon *all* the most favoured names in the catalogue, judging by the number of frames accepted, are members, not only of the Linked Ring, but of the general committee thereof. It is a pity; but, of course, what are the poor young gentlemen to do when they are themselves the only people who *can* produce pictures?"

"Dagonet" on Recent Photographic Advances.—The progress made during the last quarter of a century has been remarkable enough. It is certain that, if any one who died before 1850 could come back to life as it is now, it would be a case of *Alice in Wonderland*. I can imagine a middle-aged man fetching his grandfather and his grandmother from the tomb, and taking them for a day's outing and showing them the telephone, the electric light, the phonograph, the cinematograph, the Röntgen ray, and the female population careering madly through the traffic on bicycles. The chances are ten to one that the respectable elderly couple, after a day's experience of life in London in 1896, would gasp out a request to be allowed to retire again with all possible speed to the calm seclusion of the family vault. If they exhibited the slightest hesitancy, and their descendant and his wife thought it would not be advisable to introduce a couple of elderly ghosts into the family circle in these days of difficulty with domestic servants, their departure could be hastened. "The Master" might whisper in the old lady's ear that within a very short space of time we shall be able to speak to the ends of the earth without any connecting lines or cables, and that probably within the next twelve months it will be possible for any one who wishes it to see the Derby run at Epsom, or a cricket match played at Lord's, without leaving the easy-chair by the library fire. All that will be necessary is to have a properly prepared sheet of paper spread on the wall, and ring up the company who undertake to flash photographs of everything worth seeing to the private residences of its subscribers.—*Referee.*

Compressed Gases and Acetylene.—This subject formed the theme of a lecture recently delivered by Mr. Thomas Maben before the North British Branch of the Pharmaceutical Society of Great Britain. Speaking of the compression of acetylene, Mr. Maben said that the gas could be condensed at 32° F. under a pressure of 323 lbs., and at a temperature of 60° F. by a pressure of 570 lbs. on the square inch, so that the liquid gas could be easily stored in steel cylinders. The process of compression was, however, a dangerous operation, for this reason, that the critical point—that was the point at which acetylene could no longer exist in a liquid form—was the very low temperature of from 90° to 100° F. If, therefore, from any cause, such, for example, as the heating of a spindle in the process of screwing up or opening a cylinder, a heat of 100° F. were developed, it might at once pass from the liquid to the gaseous condition and cause explosion; but it was a mistake to suppose that the danger from explosion from a leakage was greater with acetylene than with coal-gas. If the leak was from a burner left open by mistake, the quantity of acetylene that escaped would be very much less than that of coal gas, owing to the smallness of the burner employed. Coal gas had a specific gravity of 0·4, whilst that of acetylene was 0·9, so that the rate of diffusion through a crack in a pipe would be three of the coal gas to two of acetylene. Consequently the latter could not be looked upon as more dangerous to property than the former. With regard to cost, it was calculated that illumination by acetylene would cost the same as sixteen-candle coal gas at six shillings per 1000 cubic feet.

Water.—Water is composed of nitron and carbogen half and half, and is known in aljebrer as $O.H._2M.S.$ Its chief use is to put out fire with and to fish in and to make rain with. To much water is a blizzud and not enough is a famin we don't have no famins nor blizzuds in london. When you want water to sale a steamer in you has a river if its salt its the seaside and called southend. plants what grow at the bottom of the s a is called watercreeces, there flowers is called water lilies and if you Leave 'em under the warter long enough in hot countries the warter lilies turn into water melons. Water mellons is a penny a slice but I like pine appel. Drinks are made of water such as tea and corfee. water has different tastes accordin to color. when its brown its ail when its black its ink or else stout. You tells by the bottles. If its red green and yeller its a Kemmists. if its sticky and thickish its gum or paste. Warter tastes very funny after eating peppermints. If it boils to hard it busts the engine-boiler and the machines can't work and the magazine don't get printed and the Editor makes a beano of a row and evryone gets inter hot warter. water what's froze is ice its a treat mashed with rasberrys and costs a hapenny, but when its just warter froze ordinary like it makes the whether so awful cold that the gas Can't burn even and you can't drink it. It's all froze at the north Pole and that's why lyingchang had to come back to England cos when he got to the north pole their wernt a drop nowhere and his men all died of thurst till a ship came sailing along to the windward and found 'em. A water fall is a fall er water cept when its called a fraud, and a fountin is a thing made of water that grows beside a shoeblack boy so as he can wet his blacking. people is fond of drowndin theirselves in water whenever they wantter kermit sueside. Water that comes down from the sky is called rain, water what comes up from the ground and fills up the road till The people can't get across means that the drains choked and a pleceman comes and theres nofend of a lark. In wet wether they have 2 much water so they spread it on the roads. when the rodes is dry and dusty they arnt sech mugs. men that live on land have to carry umberellers men that live in the water are divers and mermades. It is a bally newsance when you upset the water-bottle Over the editor's papers he does make such a song of it though its fairly clean as a rule. Water is useful for cleaning things with thats how men have a fresh coller on of a monday. water is a thing what some people washes theirselves sometimes, but wheres the good? You gets dirty agin direckly. *I* aint sech a idjut.—"Our Office Boy," in the *Windsor Magazine.*

Concarneau.—Old photographers are not likely to forget the enthusiastic delight caused by Colonel Gale's *Brixham Trawlers*, which was exhibited in the days when instantaneous effects were by no means common. No better place for just such an effect as that in the picture just referred to can be found than Concarneau. There is a stateliness in the long procession of sardine boats that cannot fail to move even the most indifferent beholder. When the boats are back in their haven, and their silvery cargo discharged, there is a striking effect produced by the hanging out of the nets to dry, which is more available for the painter than the photographer, for colour plays an important part in the scene. The nets are dyed a variety of colours, but the most prevailing one is an indescribable blue—it is not turquoise, nor is it aqua-marine; and yet it is a little of both. A large slice of the blue of the sky mixed with just the right proportion of the green of the sea would come somewhat near it. The meshes of the nets are so fine that, when they are festooned from the masts, the boats look as though they had been decorated by rare-coloured weeds, culled from Neptune's garden, to do duty for some eventful festive occasion. Alas! how frequently the photographer is made to sigh when he finds that colour is absolutely necessary for the greater part of the effects most striking to his eye. If the artistic eyes are near companions of a fastidious nose, let not the owner come to Concarneau. It is true there is not the variety of Cologne; but, for the mightiness of its one great stink, this fishiest of places might challenge the world. The old town of Concarneau is a toy specimen of feudal times. It is nearly surrounded by water, and completely walled in, and towers and drawbridge protect the entrance from the quay. To modern eyes it is difficult to see the need for all these precautions for there seems nothing to protect except abject poverty. All the life and motion is in the new town, which has grown up outside the fortifications and along the quays. A striking feature of the country lanes in the neighbourhood is produced by metal hedges! Let not the reader lift his eyes in incredulity, for it is a sober fact. All the fragments of tin left over in the manufacture of the sardine boxes are carted away to make hedges, and, without doubt, they are more effective for this purpose than either briar or bramble. Where newly deposited, this refuse dazzles the eye with its silvery glitter; but, where age has crept in and time has put on his touches of colour, the effect in the distance is most striking, for yellow, bright orange, and russet brighten the scene in every direction, and make the whole district gay with its metallic floriculture.—Valentine Blanchard in *Autotype Notes.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
28-31	Borough Polytechnic	Second Annual Exhibition.
28	Bradford	Children's Night.
28	North Middlesex	Technical, and Nomination of Officers for ensuing year.
28	Oxford Camera Club	Lecture: *Enlarging.*
28	Richmond	Open Evening.
29	Hackney	*With a Hand Camera in Venice and Lucerne.* W. Fenton-Jones.
29	Munster	*Emulsion-making and Plate-coating.* H. Schröter.
30	Croydon Camera Club	Formal Inauguration of the New Rooms.
30	Halifax Camera Club	Prize Slides.
30	Leeds Camera Club	Lantern Exhibition. The Members.
30	Leytonstone	Members' Lantern Evening.
30	Photographic Club	*Woodland Studies.* Fred H. Evans.
31	London and Provincial	Lantern Night.
January.		
1	Bromley	Lantern Evening.
1	Nottingham	Prize Slides.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 17,—Mr. W. D. Welford in the chair.

The HON. SECRETARY said the members were indebted to the Chairman for the large number of periodicals relating to photography upon the table. He wished it to be known that they could rely always upon finding the current issues of the principal journals of the Continent and America, besides those of the colonies and Japan and the more familiar home papers, in all numbering from fifty to sixty.

Mr. E. H. BAYSTON remarked that owners of pocket Kodaks, no doubt, sometimes wished to get a little larger image than the regulation size allowed by these cameras, and he passed round a negative of a head produced by placing a spectacle lens close up against the camera front before the existing lens, resulting in an appreciable enlargement of the image. It involved the same principle as the Frena magnifiers.

Mr. T. BEDDINO read a paper entitled

A NOTE ON REFRACTION AND DISPERSION.

Mr. E. W. PARFITT inquired as to what effect a lens which was not corrected for the whole of the spectrum would have on the image.

Mr. BAYSTON asked if there was any practical and popular means of distinguishing between crown and flint glass.

Mr. H. C. RAPSON remarked on the softness of some of the new glasses, and asked whether lenses made of such glass were liable to deterioration.

Mr. A. HADDON wished to learn whether the new lenses were unattacked by sulphur compounds, and whether they suffered more from abrasion than those made of the old glass.

Mr. BAYSTON inquired whether it would be harmful to a lens of the new Jena glass if used for enlarging with a strong light.

Mr. PAUL MARTIN asked how the rapidity of the old and new glasses compared.

Mr. BEDDINO, in reply, said the definition would most likely be degraded by a lens improperly corrected. He did not think an inexperienced person could hope to distinguish between crown and flint glass at sight, or to be able to pick out one from another by other than very careful examination, though the colour might be a guide. If the softening action had any influence on the density of the glass, it would alter its refractive index. As to the action of sulphur compounds on the Jena glasses, some were and some were not liable to this influence; for instance, one special glass was invariably sandwiched between combinations of other glass on account of its liability to attack. Limelight, or any of the ordinary illuminants, should have no bad effect on these lenses, although the great heat of an electric arc possibly might. He could not state definitely the comparative rapidities of the new and old glass in lenses, but it was inappreciable in practical work, and could be ignored.

Mr. T. E. H. BULLEN showed the two plates described at the last meeting, one of which was developed with a pyro-metol solution, and the other with a further pyro-soda solution after both had been developed for ten minutes in a pyro-soda developer, in order to see which brought out the most.

The CHAIRMAN admitted that the advantage in favour of the metol and pyro was sufficient to render unnecessary a print on paper being taken, but remarked on the absence of fog, which generally accompanied pyro soda, in the negative so developed, and he ascribed this to the strength of the bromide in the solution. He thought the results would have been much alike if the soda developer had not been so restrained.

Mr. PARFITT expected that, had the plate been left longer in the soda bath, the negatives would have been very similar.

Mr. BULLEN added that the pyro-metol developer should be very useful for studio work where time was an object on account of its greater energy.

Mr. HADDON said it was recognised that, by developing first with one developer, washing and then treating by one of a different nature, much more could be got out of a plate than with a single solution.

PHOTOGRAPHIC CLUB.

DECEMBER 16,—Mr. W. D. Welford in the chair.

The Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY presented the Club with a copy of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1897, for which the meeting thanked him.

Mr. FOXLEE showed several sets of views of Buenos Ayres. These views were printed in collotype by Mr. Witcomb, a professional photographer located in that country. The quality, both of the photography and the collotype printing, was excellent in every way. Mr. Foxlee also showed some interesting examples of the Eburneum process. These photographs were made some twenty-five years since, and Mr. Foxlee thought they were quite unaltered. The process consisted of a transferred collodion film upon a gelatine base, with which a colouring material—*e.g.*, oxide of zinc—was incorporated, the object being to simulate ivory.

Mr. MACKIE showed a coloured Daguerreotype made in about 1856. This was a good example of the process, and was in an excellent state of preservation.

Mr. RHEINBERG showed a novel instrument for "dropping" exact quantities of liquids from bottles. The apparatus consists of an ordinary glass enema syringe, the nozzle of which is inserted into a rubber cork, which has two holes, and the body of the syringe is marked to indicate its fluid contents. Into the second cork hole is inserted a bent glass tube, which serves to allow any liquid to pass from the bottle. By pressure upon the piston of the syringe in the usual way any quantities of liquid can be passed out. The invention includes the use of a rubber stop fitted to the piston, in order to regulate the output, as required.

Mr. Dallmeyer gave the Club his promised

CHAT ON PHOTOGRAPHIC LENSES.

He discussed the pros and cons. of flat *versus* curved fields, and said that photographers were still to be found who preferred the latter. Mathematical opticians, however, were all endeavouring to make lenses with a flat field, because that was the scientific goal. Andrew Ross made lenses free from astigmatism, but the field was curved. Petzval improved upon this, and the speaker believed that he had such a grasp of his subject that, had he possessed present-day advantages in the way of materials, he would have done all that had been done by latter-day opticians. The great object to be aimed at in lens construction was to obtain a perfect image throughout a plane, if for no other reason than that photographers had to use a plane surface to record their results upon. His late father made lenses giving a flatter field than Petzval's, but he achieved the result by means of a compromise between curvature of the field and astigmatism. He (the speaker) had been asked by an acquaintance if he could not do something to make an old Petzval lens more useful. As the result of this appeal, he had made a negative attachment which could be added to any lens of the Petzval type, and would give it a flat field. He called it the astigmatic corrector. The field of a lens so added to becomes perfectly flat, and at the same time free from astigmatism. A diaphragm of *f*-7 must be used, however, to remove some residual spherical aberration. Mr. Dallmeyer also described and showed his new stigmatic lens. This lens is free from spherical and astigmatic aberrations, and has a perfectly flat field. At *f*-6 it will cover absolutely and crucially a base of rather more than the focal length; at *f*-16 it will cover an angle of 80° and a base of double its focal length. It is no use to stop this lens down beyond *f*-16, except to obtain additional depth of focus and greater equality of illumination. He pointed out that this last obtained with all lenses, absolute equality of illumination of the plate being theoretically impossible of achievement.

An interesting conversation followed, in which Messrs. Foxlee, Parfitt, Bridge, Gotz, Hana, and Mackie took part, and the meeting heartily thanked Mr. Dallmeyer for his most interesting and instructive "chat."

Brixton and Clapham Camera Club.—December 15, Mr. J. W. Coade (President) in the chair.—A series of slides,

A HOLIDAY IN NORTH WALES,

were shown and described by Mr. A. E. ALLEN (South London Photographic Society). Views of Snowdon, Bala, Ruabon, Beaumaris, &c., were shown, and also views of places with less easily pronounceable names, Mr. Allen remarking that he had avoided the beaten track of the tourist as far as possible, and searched out for less known and frequented spots. Judging from the slides thrown on the screen, he had no reason to regret the experiment, having succeeded in finding some of the most lovely scenery in the country. Some fine slides of the working of slate quarries concluded Mr. Allen's series. Mr. E. Dockree had a curious exhibit in some coloured slides made over ninety years ago. Two (cathedral interiors) were specially beautiful, and it is doubtful if photography could give better results even at the present day. Slides made on Edwards's and Cadett lantern plates recently given to members were afterwards shown.

Hackney Photographic Society.—December 5, Mr. W. Rawlings in the chair.—The Hon. Secretary showed Wynne's actinometer for timing exposures of printing papers, &c. He also showed the pneumatic lantern-carrier from Mr. E. W. Hudlas, of Stockport. This is a contrivance by which a slide is eclipsed and changed with one pressure of a pneumatic ball. Members' work was shown by Mr. Hudson and Mr. Dunkley. Mr. A. HORSLEY HINTON then read his paper on

PICTORIAL PHOTOGRAPHY,

and succeeded in making a powerful argument in favour of this special subject as opposed to work of a merely topographic character. A long discussion followed, in which general agreement with Mr. Hinton's remarks was shown.

Putney Photographic Society.—December 17, Mr. H. Faulkner in the chair.—A demonstration on

PHOTO-MICROGRAPHY

was given by Messrs. BERTRAM H. JONES and WILLIAM MARTIN, followed by *Flashlight photography* by G. E. Martin. In opening up the subject, Mr. Martin mentioned that photo-micrography was far easier than many people imagined. Any one possessing a microscope, camera (with or without lens), and an ordinary paraffin lamp, need not hesitate to attempt this very fascinating scientific branch of photography. Those who had an oil, or, better still, limelight lantern, had an advantage in being able to give much shorter exposures. Two or three points were mentioned as being most important to observe in order to be successful, viz., the tube of the microscope should always be lined with black velvet to prevent reflected light, as, without this,

flare spots would result in the photographs; and when using an ocular, this should also be replaced with velvet. The object, microscope, and sensitive plate must be parallel with each other; also the optical axis of the light, lenses, and camera should all be central to one another, otherwise complete failure by uneven illumination, bad definition, or distortion, will result. After going into certain details connected with the microscope and its working, some photo-micro slides were passed through the lantern, and Messrs. Jones and Martin proceeded to give a practical demonstration, and, using an ordinary oxyhydrogen limelight lantern as an illuminant, a microscope provided with a two-inch objective, and an "A" ocular, slow plates, and medium stops, the respective exposures of 35, 30, 20, and 20 seconds were given by transmitted light on the claw of a spider, section of root of madder, section of root of white thorn, and hairs of a caterpillar, which were successfully developed with pyro ammonia. The flashlight apparatus was then placed in position, and some of the members availed themselves of the opportunity of procuring photographs of the microscopical apparatus as set up with the lantern and camera in working position. Three Todd-Forrett flash lamps were employed, producing a most brilliant light each time.

Aintree Photographic Society.—The subject on Friday evening, December 18, was a lecture on

PICTORIAL PHOTOGRAPHY,

by Mr. A. HORSLEY HINTON. Each picture and diagram was freely discussed, Messrs. Inston, Adkins, Lloyd, Heron, Lockier, and Jackson entering chiefly into the question of composition, &c. The evening was certainly a very instructive one and will prove of great benefit to the members who were present. Another lecture is announced for January 15, the subject being *Norway*, by one of the members, Mr. William Lockier, who spent a photographic holiday there recently, and who obtained two silver medals for his Norwegian pictures at the recent Exhibition.

Bradford Photographic Society.—December 14, the President (Mr. Alexander Keighley) in the chair.—Mr. H. J. DOBSON, R.S.W., gave a most interesting and instructive lecture on

THE COMPOSITION OF A PICTURE.

The lecturer illustrated his remarks with photographs and engravings. He said that the knack of composing a picture was, to some extent, a gift from Nature. It could, however, to a certain degree, be cultivated by practice, like public speaking, and become comparatively easy. A great change in the treatment of composition had taken place within the last thirty or forty years. Conventionalism had, to a great extent, been abandoned, and newer methods had been adopted. Mr. Dobson compared the works of Constable and Cox with the mechanical compositions of Richard Wilson and the earlier painters of the English School. Gainsborough, he said, was an exception, and broke away from conventionalism even in his day, and his influence had been felt on British art during this century. In some of the figure pictures the change was even more noticeable. The hard and mechanical arrangements of Benjamin West, Maelise, E. M. Ward, and others, were improved upon by the modern schools. The works of Munkacsy, Israels, Orchardson, Luke Fildes, and others of the present day, were far more truthful to nature. We had lost some of the finest artists in this century within the past few years. Cecil Lawson, Fred Walker, George Mason, and J. E. Milla's would rank amongst the greatest of the English School. The lecturer commended the study of their works to all students of art or photography. An earnest student would gain most knowledge in composition from observation and continued practice. Intelligence applied to hard work would succeed eventually with patience. No definite rules on composition could be fixed, experience only could teach. Mr. Dobson's own knowledge had been acquired by continued practice for the last sixteen years. His method was only imperfect as yet, and could be improved upon; but he gave it, such as it was. In choosing a subject it was important to select the best point of view. Much time, and even expense, would be saved by securing this. The student should not attempt too much. Beginners were apt to overlook this, and show too much in their pictures. This proceeded from want of knowledge. Simplicity of design should be aimed at, and the principal object made prominent to the rest of the picture. There were many difficulties to contend with, but the young student would gradually overcome them. Mr. Dobson, when a student at the Royal Scottish Academy, went out on one occasion to sketch with two student companions. He was the youngest, and felt a little nervous when a crowd of boys and girls collected. The critics persisted that his was the best picture, but he knew that this could not be, and saw that both his friends' work was too advanced for these children to understand. The people who knew most about pictures were the most sparing with their criticism. In the work of a great master there was a balance in the composition. The eye travelled instinctively to the central object. Mr. Dobson mentioned Orchardson's great picture of *Napoleon on Board the Bellerophon* as a fine example of good composition, and also Luke Fildes' *Doctor*, but he considered the latter's popular picture of *The Village Wedding* an example of crowded composition, and wanting in simplicity. The lecturer exhibited reproductions of these pictures, which were kindly lent by Messrs. Matthews & Brooke, and Mrs. Megson. Mr. Dobson went on to say that the balance of light and shade was also very important to success in a picture. The founder of the Dutch School (Rembrandt) had carried this to greater perfection than any other artist. No other master appealed to him so much as Rembrandt, and he (the lecturer) placed him head and shoulders above any other painter the world had yet produced. His influence was felt in every school, but was more evident amongst the modern French and Dutch. The modern Impressionist School could be traced to his influence, and it depended solely on "values" in light and shade. The modern schools, he thought, would compare favourably with the old masters, but it was for posterity to decide. Never in the history of art had there been more striving after truth, and he had no doubt that many of the masterpieces of the nineteenth century would take place amongst the greatest of the world. The lecture was listened to with great interest by a large and appreciative audience after which a vote of thanks was unanimously passed to the lecturer, proposed by Mr. George Thistlethwaite, and seconded by Mr. Oliver Nicholson.

Cardiff Photographic Society.—Mr. WM. BOOTH entertained the members on the 18th inst. with a paper on the pictorial attractions of this neighbourhood. By means of many very charming lantern slides the lecturer showed that the locality abounded in subjects, which, if handled with discrimination and taste, could be turned to much account in the hunt for pictures. That this production of really artistic results from, apparently, the most unlikely sources, is probably known only to a few of the "knowing ones" is rather prominently shewn sometimes in the attempts that are made, for example, in figure studies with impossible accessories. The wise appear to be content with simple materials, and are, as a rule, rewarded with better success. Some of Mr. Booth's pictures had been secured in, generally speaking, most uninviting spots. The lecturer showed an extensive acquaintance with the town's history, and has been very greatly interested in the local photographic survey. A large number of his contributions are stored in the Free Library, where, by the courtesy of Mr. Ballinger, the librarian, the lecture was given, and form part of a valuable collection of records of the ancient monuments of the district. Large as the collection now is, it is hoped that no opportunity may be lost by those interested in these matters to contribute any prints they may be able to secure. The meeting closed with a hearty vote of thanks to Mr. Booth for the interesting paper he had given.

Hawke's Bay Camera Club.—At the Annual Meeting of the Hawke's Bay Camera Club the report and balance-sheet showed the Club to be in a flourishing condition. The number of members has increased to sixty-five, and a comfortably furnished club-room, with dark room attached, is now available for members and their friends. Papers have been read, and practical demonstrations have been given at the monthly meetings. Reference was made to the successful Exhibition recently held by the Club, and members were urged to contribute to the Dunedin Club's Exhibition, which opened on December 2. The following officers were elected for the ensuing year:—*President:* Mr. H. A. Banner.—*Vice-President:* Dr. A. Milne-Thompson.—*Committee:* Messrs. T. Bear, S. E. Cooper, G. F. Green, J. K. Newton, and H. Owen.—*Treasurer:* Mr. G. H. Pierce.—*Secretary:* Mr. W. Beswick, Post-office.

Leeds Camera Club.—December 16.—A goodly number of members followed, with intense interest, a description of

THE PREPARATION OF PLATES FOR COLLOTYPE PRINTING,

given by Mr. W. T. WILKINSON, the author of several works on this and kindred subjects. During the course of his lecture, Mr. Wilkinson mentioned a few important points to be observed; amongst others, the necessity of avoiding damp and maintaining throughout a uniform temperature. Very thick plate glass is carefully ground upon one side by rubbing with fine flour emery for some minutes. It is then coated with a substratum consisting of 4 ounces each four-ale and porter, 4 to 12 drops of ammonia, ·880, to which is added 1 ounce of silicate of soda just before using. After drying, the plates are rinsed under the tap for a few moments, and again dried, when they can be kept indefinitely. For the sensitising process an oven will be required, and kept at a temperature of not more than 120°. A stock solution is made of—Methylated spirits, 1 pint; tincture of tolu, 1 ounce; chromic acid, 5 grains; and the sensitising mixture consists of collotype gelatine (Swiss), 150 grains; water, 2 ounces; potassium bichromate, 37 grains; above stock solution, 1 ounce. The spirits must be added gradually, and the solution well stirred. Of this solution 4 to 5 minims will be required per square inch of plate for coating. The plate is then placed in an oven and "cooked" for forty-five minutes. A reversed negative is required for printing, the margin of which must be "blocked out" with tinfoil. The prepared plates should be kept from one to fourteen days face to face before printing. Mr. Wilkinson recommends an open-back printing frame, in which an average exposure of thirty minutes to good (but not sun) light, or several hours in dull weather, will be necessary. After exposure the plate must be washed for a few hours to remove the free bichromate. A continuation of this lecture will be given by Mr. Wilkinson on February 17, 1897, when a practical demonstration with the collotype press will be given. December 30: Annual Lantern-slide Exhibition at Fairburn's Athenæum Restaurant, 7, Park-lane. Members can have tickets for friends on application to the Secretary.

Oxford Camera Club.—December 14, the members were specially fortunate in having the opportunity of seeing over a hundred of

CAPTAIN ABNEY'S FAMOUS SLIDES OF SWISS SCENERY,

which he had kindly lent for the occasion at the instance of Miss Venables. The slides were wonderfully successful in their rendering of the ice and snow, which forms so large a portion of Swiss scenery at high altitudes. There were also some very fine cloud effects. A good many pictures were specially noticeable, as having been taken in winter by moonlight, this being necessary owing to the sun's altitude being too low during the winter for many of the best effects. A very hearty vote of thanks to Captain Abney for the loan of the slides, and to Miss Venables for procuring it, was passed with acclamation, as well as to Mr. Joyce for lending and working the lantern.

Wolverhampton Photographic Society.—December 18.—Some Welsh views by Mr. E. L. Coulthurst were much admired, but his statuary was marred by faulty outlines in blocking out. The architectural views proved interesting. The slides, on the whole, were considered excellent and gave much pleasure, and a hearty vote of thanks was accorded for the loan of them. With the view of showing the desirability of more care in the use of the slides, it may be well to note that eight broken ones were withdrawn and returned for replacement, and there is one slide missing.

FORTHCOMING EXHIBITIONS.

1896.	
December 29–Jan. 2.	Borough Polytechnic Photographic Society. P. C. Cornford, 103, Borough-road, S.E.
Dec. 1896–Jan. 1897	Bristol International. Hon. Secretary, 20, Berkeley-square, Clifton, Bristol.

1897.
January 14, 15 ..... Weymouth and District Camera Club. E. C. Bennett, 10, Newberry-terrace, Weymouth.
February 1–27 ..... Glasgow *Evening Times* Camera Club. The Secretaries, *Evening Times* Camera Club, 46, Gordon-street, Glasgow.
March 6–13 ..... South London Photographic Society. Charles H. Oakden, 30, Heuslowe-road, East Dulwich, S.E.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

RESIDUES.

To the EDITORS.

GENTLEMEN,—In a recent issue you state, in reply to a correspondent, that, after reducing silver residues in a crucible, it is necessary to break the crucible in order to remove the ingot. In my own practice I have not found this to be the case, as I have used one half a dozen times, and it is still whole. Many photographers, I believe, avoid attempting the reduction of their residues under the mistaken impression that it is a very difficult process, and that a specially constructed furnace is a necessity, whereas the kitchen fire will serve the purpose quite well, at any rate in the case of small quantities. My usual plan is first to see that the fire is in good trim and free from flame. Place the crucible containing the residues in the midst of the red coals, and cover over the front of the fire with a large sheet of paper so as to cause a good roaring draught. Soon the residues will begin to boil and become white hot. Then remove the crucible, and, as soon as it is judged that the silver has set (while still red-hot), knock out the contents into a flag, and there you have a bright, clean lump of silver, the whole process only occupying about ten minutes. It is very simple, and certainly interesting and profitable without a doubt. Many professionals pour pounds of silver down the sink in the course of a year.—I am yours, &c.,

29, *Chapel-street, Leigh, Lancashire.* THOS. HADDOCK.

SCIENTIFIC INSTRUCTION AND THE PHOTOGRAPHIC PROFESSION.

To the EDITORS.

GENTLEMEN,—Mr. D. J. O'Neill, in answer to my letter of December 5, shirks the plain issues I put forward, and intrenches himself behind the Socratic platitude, "Knowledge is power." I admit it, but the immediate question for us to consider is, What exact knowledge is power at this particular moment to the photographic profession? This question Mr. O'Neill has not squarely faced. He prefers to seek refuge behind general statements, which convey no meaning or exact knowledge. I think the people of this country have a right to ask—and they are beginning to ask—to what definite end are the 50,000*l.*, 100,000*l.*, and other large sums of money being applied through the medium of polytechnics?

In my article on "Polytechnics and Photography" I questioned the utility of instructing photographic apprentices and assistants in the theory of the latent image, photographing the sun's corona, stannotype, and astigmatism. To these I added in my last, Abney on "The Law of Error," Hurter & Driffield on "Logarithms and Deposits," Lord Rayleigh on "Pinhole Images," and Meldola on "Silver Sub-chloride." To the general intelligence these are the "scientific parts thereof." It seems I misunderstand Mr. O'Neill. To him the "scientific parts thereof" needing to be taught are: "Knowledge of the nature and uses of the materials he employs," "study of chemistry," "study of 'Art' pure and simple," "photographer who turned out the best work in the town," item, "not wise in his own conceit," "not 'theory' but practice," and "something higher than rule of thumb." In all this I agree with Mr. O'Neill, and have been insisting throughout that such limited instruction is enough for the practical work of commercial photography. In addition, I maintain that such instruction does not call for the enormous buildings and large sums of money devoted to it, and that it is totally inadequate to enable English manufacturers to hold their own against French and German competitors. Hence I insisted, as a remedy, upon the endowment of research, the establishment of well-equipped laboratories, and the importance of experts, men of ability and men of genius, being in them. This harmless proposal raised the ire of Mr. O'Neill. It is such specialisation as this that has enabled Germany to capture so many of the newer industries, experts like Röntgen actually creating by simple experiments vast industries.

With regard to profits, prices, and wages, I observe that Mr. O'Neill has forgotten to mention the latter; this is significant, for it indicates the reason that induced him to reply to my letter of November 21. In that letter I asserted that polytechnics caused assistants to be supplied at a greater rate than the trade demanded, hence this operated to the advantage of employers by keeping wages at a low level. Now we see by his last that Mr. O'Neill will not admit that polytechnic teaching has proved beneficial to assistants; but why not if he advocates it? Because he saw that I should immediately ask, Why, then, does not the N.A.P.P. pay an increased wage to assistants having a polytechnic certificate? Of course, in spite of Mr. O'Neill, they do nothing of the kind, but act precisely as I say, that is, they take advantage of this stress of competition to obtain cheap assistants. Cheap assistants, we thus see, account for the admiration of the N.A.P.P. for polytechnic teaching. I having had the audacity to point this out, and expose the dodge, Mr. O'Neill imagined a letter in the JOURNAL would snuff me out. In this he was mistaken. He was also mistaken in supposing that this red herring, in the interests of employers, would draw me off the main scent, *i.e.*, the low wages of assistants caused partially by the action of polytechnics. I have also not the slightest doubt that the N.A.P.P. will support him in this laudable action of kicking the photographic assistant into his "proper station."

Mr. O'Neill names several employers, and, with a flourish, exclaims, "These are the people!" I fail to see how the top prices certain employers obtain improve the condition of the thousands of employers outside the N.A.P.P. who are obtaining bottom prices, neither does it show that assistants are receiving top wages; it being notorious that top-price firms usually pay bottom-price wages, *i.e.*, the competition wage. Why should they do otherwise? Whether these employers will maintain their prices is the crux of the matter. I hope they will. I am certain they will not unless they pay sufficient wage to induce men of ability to work for them. When wages were higher, the complaints of bad workmen were fewer; now, wages being low, employers are constantly complaining of bad workmen.—I am, yours, &c.,

JOHN. A. RANDALL.

42, *Tonsley-hill, East-hill, Wandsworth, S.W., December* 19, 1896.

To the EDITORS.

GENTLEMEN,—Mr. D. J. O'Neill quotes my name in his letter of last week. I admit in good company; at the same time, I am entirely opposed to his argument from beginning to end as applied to photography, and am in much sympathy in every way with his opponent, and may say, "Them are my sentiments."—I am, yours, &c.,

THOMAS FALL.

9, *Baker-street, Portman-square, W., December* 20, 1896.

A HARDSHIP.

To the EDITORS.

GENTLEMEN,—In your valuable JOURNAL of the 11th inst. you advise "Hard Lines" that he "has no remedy" against his late employers, on the ground that "the arrangement was only verbal."

May I point out what I believe to be an error in your otherwise sound judgment? In my own opinion, which I submit humbly, if "Hard Lines" was definitely engaged for a year certain, although verbally, the engagement cannot legally be determined until the twelve months have elapsed, as a contract, so far as I am aware, need not be in writing if intended to subsist for one year only. If, as I take it, he was to be paid by the week, month, or quarter, and not *so much for the whole year's service*, then he can maintain an action for damages for wrongful dismissal (although he cannot sue for wages not then due), unless there has been gross or wilful neglect or misconduct on his part or some other special circumstance to justify his employer's action in dismissing him. Anticipating the favour of your kind indulgence, I am, yours, &c., NIL DESPERANDUM.

EXHIBITIONS—A SUGGESTION.

To the EDITORS.

GENTLEMEN,—We are probably all agreed that the present arrangements for the photographic exhibitions in London are unsatisfactory. If the lantern slides are also to be seen, it is necessary to make three expeditions and pay half-a-crown in admissions.

The spacious halls of the Royal Academy are in the autumn, as far as is known, in disuse. Do you think the Academy would lend them to a combination of the societies for the lesser arts?

The Royal Photographic might have three rooms, one for pictures, one for the lantern, and one for technical exhibits; our good friends of the Salon one; and the other rooms, which perhaps should be the best rooms, used for etchings, engravings, and architectural designs.

The Academy would probably not refuse on theoretical grounds, for the improvement and cheapening of the methods of reproduction is for the interests of art, and the transfer to an autumn exhibition of some or all of the engravings and designs would give more room in summer for painting and sculpture.—I am, yours, &c., JOHN SMITH.

A CORRECTION AND THE LINKED RING DISCUSSION.

To the EDITORS.

GENTLEMEN,—"Dogberry," in your last issue, makes a definite assertion concerning myself, which he must allow me to correct. I approve of much that he writes; but, when he says that "'H. P. R.' went through the drudgery, and mastered *photography*, before he attempted art," I am bound to tell him the facts are precisely the reverse. I went through at least fifteen years' art training before I began photography. If "Dogberry" will take the trouble to consult the Royal Academy Catalogue for 1852, he will find my name in it as an exhibitor. This could not have happened without training. I did not take to photography till later, and not seriously until 1857. I hold that the camera is the *last* tool that a pictorial photographer should take up, and chemicals the last materials he should study.

May I mention that, if "Dogberry" kindly reads the "Autobiographical Sketches" I am writing for the *Practical Photographer*, he will find that I particularly congratulate myself on escaping the camera for so long a time, and show how the first twenty-seven years of my life were almost every minute of them nothing but a preparation for taking up the camera. I believe, if my early technique was as good as "Dogberry" flatteringly says it was, it was because I studied just sufficient technique for my purpose, studied it well, but took good care not to confuse myself with any more than was necessary. There is no necessity for even that much now, but there is for that higher techniqne of which the ordinary photographer never seems to think.

Now I am writing, I may perhaps refer to the many curious attacks on the members of the Linked Ring and the Salon that have recently appeared, and from replying to which I have kept aloof, for reasons which may be gathered from Mr. Maskell's letter in your last; but, as a sample of how low down they condescend (beyond even the self-respect of the very lowest), will you allow me to transfer a paragraph which has somehow crept into the ALMANAC.

"Certain illiterate tradesmen, who had tried art but failed, began to pose as 'artist photographers,' and to write the merest drivel upon art. Then followed a host of amateurs who, with a camera, could easily produce (by fluke, as a rule) a 'pictorial' transcript of nature, and they, too, joined the babble, and finally embalmed themselves for ever in a ridiculous brotherhood of children called the Linked Ring—the latest sickly flower of a morbid body."

On second thoughts, I do *not* give this paragraph as a sample of the others. Goodness forbid that I should accuse any man of being so venomous. I am proud of the success of the Salon and the Linked Ring, but I am sorry that our success should have such a disastrous effect on the mind of any man. Here we have again our scurrilous Greek, and our modern Thersites of a few years ago; he seems to forget that he is dead, and that his anonymous ghost is not even amusing.

It is not perhaps surprising such stuff is written; envy, hatred, malice, *the sense of failure*, will often induce irresponsible insanity; the wonder is that it ever gets printed. It is very rough on the unfortunate writer.—I am, yours, &c.,

H. P. ROBINSON.

Tunbridge Wells, December 19, 1896.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street. Covent Garden, London.*

PHOTOGRAPH REGISTERED:—

David Whyte, 57, Church-street, Inverness.—*Photograph of the Rev. Dr. Aird, Rossshire.*

LENS.—ABER. The lens, from the reputation of the firm, is probably a good one.

PROCESS SCHOOL.—C. L. F. The address of the school you mean is Bolt-court, Fleet-street, E.C.

LENS NOMENCLATURE.—P. T. R. "Anastigmat" and "orthostigmat" are convertible terms, signifying absence of astigmatism from lenses.

POSITIVE PROCESS.—J. BENNETT. The picture appears to be a Daguerreotype. We do not think the portion of the image that has been removed can be restored.

HELIOS.—A train of prisms is usually employed for the purpose, and will give you the result you want. The arrangement is sketched at page 407 of our volume for 1894.

PRINTING PROCESS.—S. REANY. The prints are produced on Nikko paper, which is a gelatino-bromide paper, the high surface being imparted to them by squeegeeing down.

BOOK ON STUDIOS.—UP-TO-DATE STUDIO asks for a book on studio construction.—In reply: Messrs. Marion & Co., Soho-square, publish an excellent work on the subject by Mr. Thomas Bolas.

HAMLET.—The price of the *Lantern Slide Manual* is 1*s*. It is published by Warne & Co., Bedford-street, London. For the other information you had better address Mr. Chadwick direct at St. Mary's-street, Manchester.

LENS.—E. R. F. We are somewhat sceptical of your statement that the lens, although a cheap French one, has not its visual and actinic foci coincident. However, we advise you to communicate with the firm of whom you obtained it.

COPYRIGHT.—ONE IN DOUBT. We cannot here give the space required to answer your queries. In the 1897 ALMANAC, just published, you will find the full text of the Copyright Act, the perusal of which will give you the information you seek.

CHLORIDE OF GOLD.—T. C. Sorry we are at present unable to help. If you can give us the title of the article, and that of your reply, and also a more definite date than "about thirty-six years ago," we will endeavour to look the subject up for you.

SHEET GELATINE.—A. T. F. says: "Will you kindly give me the name of some place in London, preferably in the E.C. district, where I can obtain, at a reasonable rate, sheets of coloured gelatine for use in a lime-light box?"—In reply: Cornelissen, of Great Queen-street, Holborn.

DISPUTE WITH EMPLOYER. — B. COOPER. The case appears to be so intricate that we cannot offer any advice likely to be of service. It is entirely a matter for legal advice. Why not consult the magistrates at the local Police-court? This is often a cheap way of obtaining valuable advice.

WINTER SNAP-SHOTTING.—B. OSBORNE. Instantaneous pictures can, of course, be taken of winter scenes, and without much difficulty. The conditions are: plates of great rapidity, and a lens working with a large angular aperture, say, *f*-6. Under these conditions good negatives can be secured in a fair winter light. Of course, the most must be made of the exposure in the development of the image.

HIDING VIEW.—W. A. writes: "I am going to build a studio for professional work, and the outlook from the side from which I must get my working light is very unsightly—a mews, a small cottage, chimneypots, &c. Is there any means of hiding the scene without stopping out light? I do not wish to use ground glass or stippled glass, as I have it in my present studio, and the smoke of this place necessitates continual washing of the former and renewing of the latter?"—We should advise the side in question to be glazed with plated glass. That will completely stop out the view, while the light will not be at all obstructed.

COPYRIGHT.—ALPHA. On comparing your photograph with the illustration in the paper, we have little hesitation in saying that the latter was taken from your picture; but, from what you say, although you have registered the copyright, we are very much afraid you cannot maintain it if becomes a question of legal proceedings. You see you did not take the photograph yourself, and you were paid for taking it, the work being actually done by an *employé*. However, if you write to the paper, asking a moderate fee, you will probably get it. We should certainly not recommend legal proceedings. If it be refused, you have no legal copyright in the work.

RESIDUES.—B. B. B. writes: "I am, as usual at this time, collecting my year's waste, which consists mostly of gelatine paper ashes and the sulphide from the fixing baths—paper and negatives, with a very little ash from albumen paper. Last year I had about the same lot from similar sources, and I was very much dissatisfied with the return made for them. Do you think I should do better if I tried to reduce the waste myself?"—No. You must not expect the same returns from gelatine papers that you got from albumenised. They contain less silver. Furthermore, the silver, when recovered, is not worth nearly so much as it used to be.

STUDIO.—N. says: "I am building a studio 36 feet long, north and south, by 26 feet wide; space is quite open on the north, blocked in on the south, open about the same upon east and west sides. 1. As studio is wide enough for considerable ordinary work, would it not be advisable to glaze north end and work by this generally; also to glaze one side about two-thirds, and work this when greater length is required? 2. Which side would you advise being glazed, east or west? 3. Would you have roof of equal pitch under these circumstances, or a greater 'rake' the side it is glazed? 4. Opaque blind to cut off light would be available over most of the glazed portions. From which end would you think it would be best to work from, with studio in the position? 5. Do you know of a new system of fixing blinds more artistic than the usual running blinds on rollers? 6. Could you name me two or three good firms making the fixing of electric lamps to studios a speciality?"—In reply: 1 and 2. The north end might be glazed, and the major part of the work done with that light quite well. Then either the east or west sides may be glazed for special work, groups, &c. The side chosen should be governed by the time of day most business is done. If that is in the morning, the west side should be glazed, and if in the afternoon the other side. Or a certain portion of each side may be glazed and used as desired, morning or afternoon, and the north end left opaque. 3. Equal. 4. When working lengthwise, work with the camera at the north end, as the sun will be hidden by the house. If working with the north light, either end to suit the features of the sitter. 5. No, not for utility. 6. Messrs. Gwynne & Co., Brook-street, Holborn. Watford Engineering Works, Watford for arc light.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*January* 3, 1896.

THE LANTERN RECORD.

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LANTERN MEMS.

By the time this is in the press the old year will be gone, and 1896 duly ushered in. At such a time as this it is usual to review the work of the past twelve months, and, although from a lanternist's point of view one cannot say the year has been fruitful in inventions, yet it has not been barren as regards improvements and general progress.

* * * * *

One cannot call to mind any invention that is a complete departure or perfectly original in principle, but many useful modifications and variations of existing apparatus or previously known principles have been designed and introduced, the majority of which have some distinctive merit, and, what with science lanterns, mechanical lanterns, automatic lanterns, magazine and cycloramic apparatus for projection, besides the regular and irregular forms of optical lanterns, there should be no excuse, on the score of lack of variety, for the non-purchase of a lantern, while illuminants of every character are now available for lanternist purposes.

* * * * *

The boom in oxy-ether saturators that set in the year before continued through 1895, and, although personally I am not an advocate for the indiscriminate sale of them, I cannot but admire the light produced from a well-constructed ether apparatus, or fail to recognise the advantage, under some conditions, of having only one gas to convey or manufacture. Jets, again, have had added to the list the ejector and injector, a species of mixed gas jet with only the oxygen under high pressure.

* * * * *

The general distribution of electricity throughout England has stimulated the employment of the electric light for optical projection, and, as a consequence, a number of arc lamps have been designed and constructed, which have been the means of showing the lantern world that an electric arc lamp is not the fearful and wonderful thing it was supposed to be, for, by following certain well-defined rules and regulations, and working to the simplest possible directions for use, the light obtainable for lantern purposes is brilliant, simple, certain, and economical.

* * * * *

If the photographic and lantern public realise the simplicity and safety of the electric arc lamp, it is evident that the lay public do not, and, from what I recently learnt, some of the electrical engineers and general lighting contractors require a little tuition in what has been accomplished in the way of electric arc regulators and hand-fed arc lamps for the optical lantern, or they would never recommend incandescent lamps for projection purposes where arc lamps are available, or hint that the latter are attended with a certain amount of danger.

* * * * *

Any photographer or lanternist that is in doubt about this source of illumination should attend at one of the meetings of the Royal Photographic Society, the Society of Arts, or the Camera Club, and have the lamp and light explained by the demonstrator or honorary lanternist, who, no doubt, would be pleased to do so; or visit the establishment of the makers of the various arc lamps placed on the market, and see for themselves the satisfactory nature of the light, and the simplicity or otherwise of its adjustment and use.

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New carriers have found their way into the market, and, in this very necessary part of the optical lantern apparatus, it is astonishing how much ingenuity has been spent. What with rolling curtain carriers, obscuring carriers of the Eclipse and Uno-Mano type, and modified quick-changing carriers, with slide-raising adjustments, there should be no difficulty in finding a carrier suitable to one's purpose. The number of little accessories in connexion with the lanternist and slide-producer's outfit makes quite a long list.

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One cannot help regretting, as month after month goes by, which are so important to the lantern and gas industries, that no publication is made of the Home Office Committee's report on the gas-cylinder question and the restrictions concerning the use of the lime-light and conveyance of cylinders imposed by certain County Councils and the railway companies, and it is to be hoped that something will be definitely announced at once, for, with January and February as the busiest months, it is as well that trade should be encouraged, for, from what can be learnt generally, the lantern season up to now has not been very flourishing.

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If ignorance of the laws of the country and by-laws of railway companies were accepted as a plea in cases of transgression, no doubt a good many lanternists would conveniently forget these unpleasant restrictions and prohibitions. Certain it is, if a little bird whispers truly, that now and then a small-size cylinder goes into a fairly large hand bag and is conveyed to its destination. As there is a very heavy fine for taking by rail a charged gas cylinder without duly declaring it and passing it through the parcels office, it is as well that this should be known.

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What will 1896 bring forth in the way of lantern novelties? Already we have in the air rumours of projection in colours much in advance of anything done before, also a projection kinetoscope or

something of that order to show lifelike movements; then, at an early date, a modified lantern stereoscope is to be shown, and no doubt, with popular science as a subject in all schools, there will be many interesting pieces of apparatus designed for use with the lantern. These in due course I hope to have the pleasure of referring to. G. R. Baker.

ACETYLENE.

The widespread interest which was excited in both the scientific and commercial worlds, by the recent announcement of the discovery of a ready and cheap method of making acetylene, as yet shows no signs of flagging.

As I have had the light from this gas in fairly constant use for a period of some three months, and have subjected it to a series of comparative and careful tests against other illuminants in ordinary use for photographic work, I am induced to add one more contribution to the many which have already appeared in your pages. A brilliant light, second only to the lime or electric light, but which is so easily and economically produced with the simplest of appliances, must prove of the utmost importance.

Although acetylene is usually spoken of as the "new gas," it is by no means a new discovery, for it has been well known to the chemist for many years. It was first of all mentioned by Edmund Davy, who obtained it by the action of water upon the greyish mass which remained after an attempt to obtain potassium from calcined tartar and charcoal. He described it as a new hydrocarbon, to which he gave the name of klumene, but did not follow up his investigations, and the matter was forgotten, until Bertholet rediscovered it and gave it its present name of acetylene or ethine. He obtained it by causing the vapours of wood spirit, ether, or alcohol, to pass through a red-hot tube, and subjected the gas so produced to a searching investigation. It was also obtained by many other methods, the best of which was perhaps the most interesting, because it was the first instance of the production of a hydrocarbon by direct synthesis. The cylindrical carbon rods of an electric arc lamp were drilled through their entire length so as to form tubes. The ends were enclosed in an air-tight glass globe, and, whilst the light was burning, a stream of hydrogen was passed through the carbon rods, when there was a direct union of the elements of carbon and hydrogen at the temperature of incandescent carbon. The resulting gas was caused to pass through an ammoniacal solution of cuprous chloride, which formed a precipitate of cuprous acetylide, whilst any uncombined hydrogen escaped. From this precipitate the acetylene was liberated in a state of purity by hydrochloric acid.

It will, however, be readily perceived that none of these methods rendered the gas practically available for commercial use. Thus the announcement of the accidental discovery of calcium carbide made from cheap and plentiful materials, and that it liberated pure acetylene gas in great abundance by the mere application of water, was hailed as a discovery which was one of the most important of modern times.

The rapid advance and extension of the use of the electric current which has taken place during the last ten years has placed in the hands of the investigating chemist powers which were hardly dreamt of a generation ago. By the intense heat which is generated between the carbon poles he is enabled to melt the most refractory substances, even those which had defied the heat of the oxyhydrogen blowpipe; and, as the heat is generated inside the crucible itself, and directly upon the substances to be operated upon, instead of, as in the furnace, outside, and so having first to penetrate through the substance of the refractory clay, there is a great saving in energy, and comparatively little risk from breakages. The story of the discovery of calcium carbide has already been told. An American chemist, Wilson, whilst endeavouring to obtain metallic calcium from lime, employing the electric furnace and the usual reaction of carbon, failed in what he was attempting, but succeeded in obtaining, in a cheap manner, a compound of calcium with two atoms of carbon, which, upon being thrown into water, was decomposed with great violence, liberating acetylene in a nearly pure condition.

How to Make Acetylene.

Already the inventive genius of many individuals has been exercised, and patents applied for, for generators of a more or less complex character. But nothing of an elaborate nature is at all necessary or advisable for use in the photographer's laboratory. I do not mean to imply that the apparatus I employ could not be improved upon, but for simplicity it would be difficult to beat, and, although in constant use, it has never given any cause for complaint, and is entirely automatic in its action. It simply consists of a tank of galvanised iron to hold water, and a reservoir working in this like a gasometer. This is fitted with a tap at the top as an outlet for the gas, which is generated within the reservoir itself, and, as a matter of precaution against any explosion, this outlet has two or three thicknesses of fine wire gauze over it. Inside this reservoir, at the top, is a hook, from which is suspended by a wire a common flower-pot, which has also a piece of fine wire gauze inside it at the bottom, the use of which is to keep the residue of calcium hydrate formed from falling into the water. A pound of calcium carbide is put in the flower-pot as a charge, the reservoir placed in the tank, and the tap turned on to allow the air to escape, and as this takes place the reservoir gradually sinks down into the water. This necessarily causes the flower-pot to dip into the water, which, passing through the hole in the bottom, instantly generates a quantity of gas, and the meter at once rises, lifting the charge out of the water and stopping the action of the water until the gas is used up. This goes on continually until the whole of the calcium carbide is exhausted.

The inside meter is of about one cubic foot capacity, and a charge of one pound will give a continuous steady light from eight to ten hours with a pressure of one inch. The burner I use is a No. 0000 Bray's special, which consumes less than half a foot per hour. The question of a suitable burner was a difficult one. I first tried a No. 1 Bray, but the flame was so large and gave so much smoke that I had to abandon it. I next tried No. 0, and then No. 00, which was the smallest obtainable at the time, but still the smoke was great and the flame too large. With the burner above mentioned, however, the light is perfection, being perfectly free from smoke, of comparatively small area in the flame, and very brilliant. These are all points which render it of great use for enlargement or lantern work.

Testing the Light.

The method I adopted in making comparative tests of the light for photographic work was as follows: The light was placed upon a table, and, at a measured distance of four feet, a board was placed to receive a quarter-plate printing frame. Instead of a negative, a graduated quarter-plate actinometer screen was employed, consisting of a series of square apertures with increasing number of thicknesses of thin coloured gelatine films upon them, numbered from 1 to 25. No. 1 was clear glass, and No. 25 appeared nearly opaque, with all grades between. Selecting a good brand of commercial plates, one was placed in the frame behind the screen, and exposed to the acetylene light for three seconds, when the plate was changed, and another exposed to the three-wick oil lamp commonly used in lantern work, and yet another to the limelight blow-through jet, giving the same distance and exposure in each case. All three plates were then developed together in one dish. The experiment was repeated several times with varying exposures, but the comparative results were about the same. In the case described, the triplexicon oil lamp ranked far away the lowest, only just rendering No. 5; the acetylene came next with No. 16, and the limelight gave No. 21. As the light of the limelight appeared to the eye far the most brilliant, this result of the acetylene was a surprise, and showed that the light is exceedingly rich in actinic rays. I have not had an opportunity of comparing it with the incandescent gas burner, but I should judge it will be at least double the power.

Employed as an illuminant in the lantern, the result was at first disappointing, until I obtained the small burner, when a good five-feet disc was given, and one which would be admirably adapted for parlours or small rooms. By the use of two burners suitably placed, copying can be readily done without the aid of daylight, and, by increasing the number of burners to seven or eight, portraits could be taken at any time quite as quickly as by ordinary studio light. It will thus be seen that there is probably a useful future before acety-

lene in the photographer's every-day work. Into its more extended commercial use I do not propose to enter, that being outside the province of a photographic article; but, viewed from a chemical standpoint, acetylene has many points of interest.

The Chemistry of Acetylene.

Its constitutional formation is simple enough. Common chalk, and shale coal, or any other convenient form of carbon, are heated together. The carbonic acid first escapes, leaving calcium oxide, CaO. The oxygen unites with an atom of carbon and in turn passes off as carbon monoxide CO, thus reducing the chalk to metallic calcium, which, however, immediately combines with two atoms of carbon to form calcium carbide, CaC_2. The acetylene reactions have been well investigated by chemists, and many of them are of special interest to photographers. By passing through cuprous chloride and ammonia solution, copper acetylide is formed as a red precipitate, which, however, should not be allowed to dry, as it is an explosive. The washed precipitate, treated with granulated zinc and dilute ammonia, is decomposed into ethylene by taking up two more atoms of hydrogen, $C_2H_2+H_2=C_2H_4$. This ethylene burns with a brilliant light, but of less than half the power of acetylene. Passed through a warm solution of chromic acid, ethylene is converted into aldehyde, or aldehyde may be obtained directly from acetylene, by passing through a hot solution of mercuric bromide. This action is curious and not thoroughly understood; but, the acetylene so treated unites with a molecule of water $C_2H_2+H_2O=CH_2:CHOH$. This aldehyde forms a good starting point for producing the salts of hydrazine (H_2N-NH_2), or it is easily reduced to alcohol by nascent hydrogen. Acetylene mixed with an excess of hydrogen in the presence of platinum, black takes up four atoms of H and ethine is the result, $C_2H_2+2H_2=C_2H_6$. The oxide of ethine is sulphuric ether. A mixture of acetylene and phosgene, passed through a tube at a dull red heat, is polymerised to C_6H_6 or benzine. If acetylene is mixed with nitrogen and a series of electric sparks be passed through it, hydrocyanic acid is formed, $C_2H_2+N_2=2HCN$. Thus the cyanides may be synthetically constructed. By oxidation with potassium permanganate or chromic acid, acetic acid, oxalic acid, and formic acid are formed. Thus it will be seen that the possible uses of acetylene are almost endless. A specially interesting reaction, however, is the formation of one of the NH_2 groups by a simple operation. If calcium carbide is placed in absolute alcohol, no action takes place; but if water is present, the alcohol is dehydrated with the liberation of acetylene, which dissolves in the alcohol, but may be driven off by heat. If to the alcohol and calcium carbide a solution of ammonium chloride is added drop by drop, the acetylene is given off and the ammonium chloride at the same time is decomposed by the calcium hydrate, to form ammonia, NH_3. The two unite, but the ammonia is split up into H and NH_2. The result is a gas, ethylene diamide, $C_2H_2+2NH_3=C_2H_4(NH_2)_2$. This gas unites readily with various acids to form well-defined crystals, and would be a good addition to the list of our NH_2 developers.

I have hitherto said nothing as to the price of calcium carbide or the cost of the light. It is yet too soon to predict what it will be. The demand will, no doubt, speedily produce an increased supply, and consequently cheapen the price. At present, calcium carbide may be obtained retail at about 1*s.* per pound. Statements have appeared in the papers that it could be purchased now at 2¾*d.* per pound. Such statements, however, are misleading. Upon inquiry at the makers', it will be found that, to get it at that price, not less than a ton will be supplied. To this must be added the cost of metallic cases and packing, with carriage from either Germany or America, and railway transit here. The railway companies, I understand, also refuse to carry it except as an explosive under special conditions and charges, so that the price at which it is at present supplied by our dealers is not by any means exorbitant. Whenever our own manufacturers see their way to make it at home, the cost will be considerably reduced. Even at its present price, however, it is a cheap light for photographic purposes. One pound of calcium carbide makes about five cubic feet of acetylene, and this, with a No. 0000 burner, will last from eight to ten hours consecutively.

Edwin Banks.

EXPERIMENTAL WORK WITH A LANTERN.

It is somewhat surprising to find how seldom the lantern is used for experimental work at society meetings, and evenings devoted to this work might well form a welcome change to the ever-recurring lantern-slide exhibition. The necessary apparatus is by no means costly, and can even be made at very little cost.

For many purposes a special optical front is required, but this can be constructed, using the ordinary lens mount, and with very little extra outlay. The front combination of the lens should be removed altogether, as also the concave lens of the back combination. A piece of stout millboard, just large enough to fit into the lens tube, should be obtained, or it may be fitted like an ordinary cap, on to the front of the tube. In the centre of this card should be cut an aperture large enough to take a piece of postal tube of about one inch diameter, which should be well glued into the hole.

Into the tube, which should be about two inches long, is inserted a plano-concave lens to parallelise the light. The best way is to provide three or four concave lenses of varying foci, so that beams of different diameter may be obtained.

Another piece of apparatus, which is always useful, is a slit, and this can also be made very reasonably. A sheet of glass coated with black varnish, and a narrow streak of the varnish can be scratched off with a small piece of wood cut square across. Such a slit cannot, of course, be adjusted as regards width, but its length can be altered by using a piece of black card. A brass slit may easily be made, and it is almost as easy to make it adjustable as of fixed size. A slit one inch long is quite long enough; it is therefore necessary to obtain two pieces of brass plate about two inches long and one inch wide. They should be bound firmly together with the ends even, and supported on a block of wood, and with a rather fine file sloped off at one end at an angle of about 45°. When this has been done, the pieces should be separated and turned back to back, so that the two edges slope away from the centre, and should be firmly bound together in this position, and fastened either in a vice or to a block of wood, so that they cannot shift and will keep level. Now, with a piece of snakestone, which can be obtained from almost any dealer in process materials, polish down the sharp edges slightly, not much, but just sufficient to take off the knifelike edge. Great care is required at this stage to keep the edges parallel, and not to polish more off one end than the other, or else the slit will not close. Commercial slits are usually made entirely of brass, but this is not actually necessary; all that we want is a block of wood about 4 × 3 and ⅜ of an inch thick, with a hole one inch square cut out of the centre.

One of the pieces of brass should now either be fastened by shellac, or else screwed down to the wood, so that its polished edge just projects half way over the opening in the wood. The other slit must be adjustable, and this may be effected either by means of a screw, which is, of course, preferable, or else by merely sliding between guides; this is by far the simpler plan. Lay the brass on to the wood so that its polished edge just touches that of the other plate, then, either by brads or stout ordinary pins cut in pieces, make a guide way; the pins being round are preferable to brads. A pin should be driven in at every half inch, both top and bottom, close up to the brass, leaving just sufficient room for it to move freely. Two pieces of stout copper wire, with the ends bent over, may be driven into the wood to prevent the slip from falling off. This little piece of homemade apparatus works very efficiently, and for any one with a taste for such things is not much trouble to make.

For showing a spectrum it is usual to employ a bisulphide bottle prism, and, as these are some trouble to make properly, it is advisable to purchase one. The disadvantage of such a prism is, however, that the lantern must be slewed round at an angle to the screen on which the spectrum is to be projected, or else the screen placed at one side of the room. A direct-vision lantern prism, constructed of glass, is a somewhat costly affair; but this difficulty may easily be got over by a very simple and ingenious dodge, suggested some time ago by Mr. A. Haddon, and this actually is to construct a water prism, in which is placed the bisulphide bottle, the result being that the refraction, but not the dispersion, of the light is destroyed. The water prism consists of an open box, the base of which is about three times

the length of the base of the bisulphide prism. Its sides are planed off at an angle of 60°, and colourless plate cemented on to them. The width of the box need be no more than just sufficient to take the bisulphide prism, the depth being, of course, determined in the same way.

The wood of the box may be mahogany, teak, pitch pine, or any other wood, but it will be necessary to make it thoroughly watertight inside, and this can be done by using a compound of—

Asphalt	4 ounces.
Mineral naphtha	10 „
Indiarubber	30 grains.

This, applied once or twice, will make almost all wood watertight, and the only precaution necessary is to avoid the near proximity of a light whilst applying it. To cement the glass on to the ends there is nothing better than stick lac. This is difficult to obtain of good quality, but round Hatton-garden many little oil-shops, dirty in appearance, will be found where good lac can be obtained.

The prism having been constructed, it is only necessary to place the bisulphide bottle in the box, with the apex in the middle of the base of box, and then fill it up with water to complete it. The dispersion with such a prism is not very great, the length of the spectrum at about twenty-five feet being only about three feet, but this is quite long enough for all experimental purposes, and, in fact, too long in some cases. If greater dispersion is required, it will be necessary to use two bisulphide bottles, and to double the length of the water prism, but this is attended with so much loss of light that experiments are robbed of much of their value.

To obtain a spectrum on a screen it is only necessary to place the homemade optical front on the lantern, the slit in the ordinary slide; stage and focus the slit sharply on the screen, and then place the prism in the path of the rays. With an ordinary bisulphide it is necessary to find the angle of minimum deviation, and this can be done by merely turning the prism on its stand, and, as it is turned, the spectrum will be seen to shift, as it were, from side to side of an image of the slit, and the position when it does not shift is the correct one. Actually the brightest spectrum is formed when the prism is in such a position that it gives the spectrum comparatively short and at the least distance from the straight line drawn from the lens to screen. With the compound water prism the base of the prism requires practically to be in a straight line with the axis of the lens.

There is only one point with regard to the use of bisulphide. Its smell is not very pleasant, but the purer the sample the less objectionable it is, and, if the stopper of the prism bottle is just luted down with a little bichromated gelatine, and exposed to the light, the evaporation of the bisulphide may be almost, if not entirely, prevented.

It is, of course, well known that an incandescent solid like a lime gives a continuous spectrum, and it is therefore impossible to show the Frauenhofer lines existent in the colour spectrum. It is better to use an ordinary lantern slide of the solar spectrum coloured by hand, and explain the formation, although there is no very great difficulty in showing the formation of the lines with a lantern, particularly if one is not particular as to absolute accuracy.

There are so many experiments, however, which can be performed with the lantern to demonstrate the formation of colour that must defer notice of these till a future note. PHAROS.

THE OXYHYDROGEN INCANDESCENT GASLIGHT.

[Edinburgh Photographic Society.]

I HAVE much pleasure in communicating the result of a few experiments I have made in order to adapt the use of the Welsbach lamp for optical lamp enlargement work in place of the oil pattern, and I hope to demonstrate to the meeting some decided advantages possessed by this lamp.

Before I begin, will you permit me to remark, that I do not wish to claim for this light when burning ordinary house gas, or even when aided by other means explained in this paper, that for *intensity* it can approach the limelight, but it is rather in the direction of showing slides to a small audience, and making photo enlargements, that I have hitherto worked?

To my mind there are three pretty sharply defined classes of photographers in these days. Firstly, the "button-presser;" secondly, the "half-plate carrier;" and, thirdly, the "studio man." Claiming myself to be one of the second class, I have to confess that this communication, while intended to interest all, will, I hope, commend itself to this great and growing class, amateur as well as semi-professional. Let me define it more sharply. It contains those who, having produced a good negative and a good print, have sufficient knowledge of their photograph to cause them either to attempt a lantern transparency or make a bromide enlargement of the picture; but, unfortunately, it also contains those who can produce the perfect negative with its charming print, who have to stop short for want of an easily worked and comfortable projection light.

You ask me what I mean by an easy and comfortable light? At this stage you will pardon me replying in the negative form—(1) A light requiring no preliminary trouble before lighting; (2) no trouble or adjusting after lighting; (3) no smoke or smell: (4) a minimum of heat; and (5) a sufficient intensity with great actinism and pleasing colour.

Now, Mr. President and gentlemen, in these specifications you will, doubtless, think I strike for a very high standard, but, when we remember some of the great objections which pertain to the oil lamp, on the one hand, and the limelight on the other, I venture to say that the elaborate drying, trimming of wicks, and cleaning with oily rags, which precede the use of an optical oil lantern, not to mention the smoke, smell, and great heat, are sufficient to make one hesitate before starting an enlargement in the dark room, or venturing into a drawing-room full of ladies. In both cases the final "blow-out" is a relief to all concerned.

Turning now to the use of the limelight, with its great brilliancy and immense power, there can be no doubt that to the vast majority of those I now particularly address it would prove a needless waste of energy. In the first place, for dark-room work its heat is intense, it requires almost constant attention while at work, and the flame is, after all, not so steady as one would wish. Taken into the drawing-room, the hissing is objectionable to the audience, while the small innocent explosions which sometimes occur within the lamp are very unpleasant if it is doubted that the lamp is in careful hands.

Possessed as I have been for the last six or seven years of one of these "paraffin oil optical furnaces," which I generally used in a very harmless way for micro projections, and throwing a six or seven-feet disc comic slide on the screen now and again, to amuse my children, I kept an open mind, as Mr. Gladstone used to put it, for any reasonable improvement short of increase in "furnace" power. Over a year ago I began to turn my attention to the Welsbach incandescent gaslight, which was making electric-light promoters feel rather uncomfortable in many quarters, and about the same time a writer in one of our journals "wondered whether this light would give a better colour than that of oil in the magic lantern." Having procured from the Incandescent Gaslight Company one of their burners, I had it fitted to a stand to go into my lantern, and made so that the centre of the illuminant would coincide with the axis of my condensers.

As some of those present may not have studied the construction of the Incandescent Company's lamp, I would like to describe it generally. It consists of a Bunsen burner, with its tube widened out at the top, into which is fitted a wire grating with a circular stop in the centre, which does the double duty of dispersing the flame equally round the burner and serving as a stand for supporting the porcelain stick, to the top of which the mantle is suspended. As the mantle forms the subject of patent, and, not being a chemist, I can tell you little about its components, but I believe it to be constructed of material resembling the cotton from which ordinary wicks are made, and which is dipped into a liquid consisting mainly of thorium after being woven. From what I saw at a kiosk at the Amsterdam Exhibition this summer, where a large working exhibit in mantle-making was going on, I can quite understand that the manufacture of these articles must be a very remunerative business, and possibly well deserving of the most jealous protection against competition. Although personally I have not the slightest interest in the Incandescent Gas Company's concern, I think it may interest the meeting to quote from the printed report by the manager of the Leith Gas Works, which states that, for the cost of 1000 feet of gas, viz. 3*s.* 6*d.*, the incandescent electric gives 1540 candle power; common gas, in a five feet per hour jet, 5000 candle power; and gas in the incandescent Welsbach burner, 18,440.

Returning to the subject-matter of my paper, viz., the adaptation of the Welsbach light for ordinary lantern work, I find in it all the superior convenience which gas always possesses over oil lighting—

minimum of trouble, absence of smell, and almost complete safety. A few yards of rubber tube attachable to any convenient jet is the only requisite. The tap gives the power of instant regulation, and the lamp in the lantern may be left burning by purpose or accident any length of time without attention or danger greater than that of neglecting to turn out the "lobby gas before retiring." In connexion, I may here confide that, although I seldom, "hardly ever," forget to turn out a jet before locking up, I did so on one occasion with this lamp. I was admiring a new slide which I had that day purchased, when I was called from my dark room, and forgot to return. Next evening, on entering the room, my classic statuary figure burst forth in full view, to my astonishment, and, knowing the joke only cost me about a penny, I think I can afford to tell you it in confidence, at my own expense.

Considering this light from an optical point of view, I find its colour, compared with an oil lamp, a great improvement, resembling as it does that of the lime and electric arc lights, a purity and crispness is at once discernible, and, what is much more valuable to us, its actinic power is very much greater than that of oil; and, as we well know shortening of exposure in enlarging means prevention of fog, this attribute alone should be sufficient to commend it to your consideration.

You will observe, the lantern is provided with a circular hooded chimney to take the ordinary funnel of the lamp, and, although I have found no serious tendency to breakage, I have adopted the mica chimney in preference to glass. This chimney costs only 1*s.* 4*d.*, and with care will last many years. The confinement of this lamp in a lantern has absolutely no deteriorating effect upon its burning, even when a focussing cloth is thrown over to prevent stray rays reaching the bromide paper when enlarging; and, in connexion with this, I may say that, so far from this light approaching what I have called a furnace, I find it possible to use the focussing cloth in this way during a pretty long exposure without singeing the cloth, and there is certainly no need of the alum tank.

I am now about to throw a picture of seven-feet disc upon the screen, and you will note the purity of colour and steadiness of light. Note also a property which may be useful in the dark room, viz., that the light may be turned completely out for two or three seconds and burn up again when turned on.

In order to shorten exposures, and at the same time be enabled to give a lantern demonstration to a moderately sized audience, such as this, I commenced to experiment by feeding oxygen into the lamp, in the hope that an improvement would result. But I soon found that by mixing the gases in a Bunsen where air is present forms an explosive mixture, and is an experiment not likely to be repeated by any one who tries. I then determined to burn the oxygen outside of the lamp proper, and designed a burner for the purpose, which has been found to work well and safely. If you will kindly refer to the drawings, I will endeavour to explain its simple construction. The drawing is a semi-sectional elevation of the lamp, and the red lines show the general construction of the oxygen attachment. The oxygen comes from the cylinder, per regulator, in the usual way. After passing the check stop cock, it passes through perforations in the end of the tube, which spread the gas within the burner, and finally the gas emerges through very fine perforations on the top of the burner at a low pressure, and acts by stimulation of the incandescence on the part of the mantle next the condensers. The burner and a portion of the supply pipe is fitted to the top of the lamp by an annular ring, and may be removed by unscrewing the union joint should the remaining part of the fitting require to continue fixed. The whole apparatus, however, may be removed by unscrewing the pinching screw which secures it to the foot of the lamp, so that, by means of these arrangements, the oxygen part can be added or dispensed with as occasion requires. When in position, the top of the oxygen and hydrogen burners should be about the same level, with a space of from one-sixteenth to one-eighth of an inch between them, into which the foot of the mantle slips.

During my first experiments with oxygen in this way, I was troubled by finding that the most brilliant part of the mantle sometimes faced the back or a side of the lantern, away from the condenser, with the consequent darkened field upon the screen. To meet this erratic habit, I thought of fitting a turntable on the Welsbach fitting. After repeated experiments, however, I found the best way to cure this is to block out the rear portion of the mantle by means of a hood of platinum foil placed inside the mantle, and held in position by the ring which supports the oxygen-burner. This is a "perfect cure," as it not only concentrates the light to the front, but enhances its illuminating value, and also helps to steady the mantle without doing it injury. I may here say that this is a most essential part of the apparatus, and one which I claim as quite novel. When we come to consider the photometric values later on, you will be better able to appreciate what I have just described.

It is needless to deny that the fragile nature of these mantles is very much discounted by the public generally, and especially those who have not tried or given them fair play. For instance, the mantle sold by the Company is, as a rule, too long, or, as the ladies say, too "deep in the skirt;" but, in order to adapt it for this lamp, I usually clip fully half an inch off the bottom, which has the effect of preventing splitting and fraying, so common in ordinary lamps.

One of the chief fears I had for the success of the oxygen fitting was the interference with the air passage between funnel and mantle, but I find no deterioration whatever. In fact, in course of my experiments, I have disturbed and upset all the air currents at one time or another, and have not been able to detect any reduction of intensity, or even unsteadiness of light. An oil lamp, if treated as I sometimes treat the one before you, would nearly suffocate the operator with smoke, or go out altogether.

Before leaving the subject of the mantle, allow me to state that up to the present I have found that no injury whatever is done to the mantle by burning oxygen as I describe, neither can I detect any lessening of its durability. Under ordinary care in moving the lamp about, even from one room to another, there is no reason why a mantle should not last an operator a whole season: indeed, I have had one in frequent use during three months which is as good as when first fit.

With your permission, I will now show you the effect of the oxygen on a picture through a lantern plate of ordinary density. In order intelligently to express in figures the actual value of this light, I asked Mr. Ivison Macadam to make some careful photometric tests, which he was good enough to carry out at the expense of considerable time and trouble, extending over several evenings, at my own house, and also in his laboratory; and, on considering these figures, you will be good enough to bear in mind that they are comparative tests, inasmuch as, where gases were used, the hydrogen consumpt was in all cases kept the same, namely, to the low quantity of three cubic feet per hour.

1. Four-wick paraffin-oil lamp.—Open light, 37 candles; in lantern, 23 candles.

2. Incandescent burner.—Without author's fittings, 40·25 candles.

3. Incandescent burner (with author's fittings).—(*a*) *Without oxygen*—Open, 47·10 candles; in lantern, 28·12 candles. (*b*) *With oxygen*—Open, 71·50 candles; in lantern, 40·50 candles.

4. Limelight burner.—Open, 80·50 candles; in lantern, 50·31 candles.

Calculating the effective discs available comparatively from these figures, we have—

40·50 c.p. + oxy.
28·12 c.p. − oxy.

12·38 of increase.

Then, for a distance of 12 feet and a 7-feet disc—

$$\frac{28{\cdot}12}{40{\cdot}50} = \frac{12^2}{x^2}$$

and $28{\cdot}12\ x^2 = 5832$

$x^2 = 207$

$x = 14{\cdot}4 = 14'\ 5'' =$ distance from lamp, at which the oxygen light would act with equal power to that of the plain incandescent gas at 12 feet; then

$$\frac{12}{7} = \frac{14{\cdot}4}{x}$$

and $12\ x = 100{\cdot}8$

$x = 8{\cdot}4 = 8'\ 5''$, the size of disc which would be obtained with illumination equal to the plain incandescent light upon a 7-feet disc.

You will please observe that the standard disc of seven feet was adopted, owing to the small room in which the experiments were made, and by no means fixes this as the limit performance of the lamp *minus* oxygen.

If the screen, sizes, and distances obtainable from the other two illuminants are calculated, we may collect the following, viz:—

	Distance.	Disc.
1. Four-wick oil	10′ 9″	6′ 4″
2. Incandescent ordinary	12′ 0″	7′ 0′
3. Incandescent author's	14′ 5″	8′ 5″
4. Limelight	16′ 0″	9′ 4″

The diagram shows very clearly these comparative proportions drawn to scale, which you will readily understand.

Referring again to the figures of the analysis, and comparing the open incandescent *without* author's fittings as against the same

burner with author's fittings, but *minus* oxygen, where we get 40·25 as against 47·10, you will appreciate the importance of the introduction of the platinum foil as a concentrator of light.

We come now to consider what I look upon as the most valuable property of this new light, viz., its photographic power, or, as we term it, *actinism*. With the view of determining a comparison with that of a four-wick W oil lamp, I proceeded to photograph one of my best and most plucky 8 × 10 negatives by transmitted light from my lantern upon a quarter-plate through a 5-inch Cooke lens working at *f*-6, but stopped down to *f*-8. A well-known member of this Society assisted me, and developed the negatives. Our tests were:—

1. Oxygen	6 seconds	.....	*under-exposed.*
2. Do.	12 „	.....	*normal.*
3. Four-wick.....	14 „	.....	*greatly under-exposed.*
4. Do.	60 „	.....	*almost normal.*

Decided that other 12 seconds, viz., 72 seconds, would give normal. Comparing the two normals, we have the proportions 12 is to 72, or as 1 is to 6.

Assuming now the fact, which I have no reason to doubt, that the oxygen does not improve the incandescent ordinary light with regard to colour, I conclude, referring again to Mr. Macadam's comparative tests, that what is got in the way of an exposure for, say, 40·5 seconds by the ordinary would be reduced to 28·12 seconds by the oxygen, which means roughly that in working this lamp without oxygen it becomes necessary to increase the exposure by one and a half times. This is, of course, assuming that the exposure is in the direct inverse ratio to the candle powers of the two systems.

Our friend, Mr. Balmain, has very kindly agreed to assist me in making a couple of bromide enlargements to demonstrate to the meeting the relative "speeds" of the four-wick oil and the incandescent oxygen Welsbach lamps, and during the few words that remain in my closing remarks, I would ask him to make the necessary arrangements for the exposures.

In conclusion, Mr. President and gentlemen, I would most respectfully commend this light to the practical consideration of this Society. During the last twelve months, I have found it a most convenient and comfortable mode of lighting either plate, paper, or screen, and I feel certain that when this light comes into the market, which I trust will be in a few weeks, it will meet the requirements of first-class amateurs as well as many professional photographers. There need be absolutely no fear of danger, as the fact of the oxygen being separated from the hydrogen in the act of burning by means of the mantle affects the gases in the same way as the Davy lamp already referred to. When we consider the combustion system in its order, as (1) the furnace, viz., the Bunsen; (2) the fuel, viz., the hydrogen; (3) the mantle heating, viz., the work; and (4) the atmosphere, viz., the oxygen, there is a sequence of natural elements naturally treated which at once commends itself to those who are aware of the importance of the prevention of explosive mixtures, especially in a lamp used in studios or dark rooms.

William Penman, C.E.

THE RISE AND FALL OF THE OPTICAL LANTERN.

The majority of writers about matters connected with the optical lantern have so steeped their souls in the creed which takes for its continual boast the promotion of their favourite from the realm of toydom to the status of an optical instrument, that they never pause to inquire whether or no the elevation is still going on. They say that the advent of photography has been the means of making the lantern—which before was a mere plaything—into one of the most powerful instruments of instruction and entertainment which an enlightened nation can possess. So it has, there can be no doubt about that; but are we right in assuming that there is to be no reaction?—indeed, that the reaction has not already commenced? The pendulum of popularity has swung a long way; it may swing back again. Photography it was that first made the stereoscope possible, and then photography gave it its marvellous popularity; but where is the stereoscope now?

Depend upon it, photography is a fickle goddess. When she was young, she gave of her best to the lantern, and nursed the feeble baby till it grew to be strong. But, now that she is older (and some say wiser), and has far choicer gifts in store, she showers them elsewhere, and the poor lantern's slides, by contrast, "must needs seem horrible." Or, perchance, our magic lantern is the victim of that "vaulting ambition which o'erleaps itself and falls on the other." Certain it is that it has lured to their destruction many men who would otherwise never have dreamed of lecturing, and who have flared up brightly for a moment upon the uncertain footing of a flowery poster—they will generally give their services provided they are well advertised—and then sink for ever into well-deserved oblivion, whence they would never have emerged but for the blandishments of unscrupulous lecture agents or flattering friends.

No one would grudge them their short-lived scintillation, if it give them pleasure, were it not that, in the fall which is the certain sequence, they drag down with them to a certain extent the whole art of popular lecturing. When will the secretaries of literary institutions and the like awake to the fact that the ability to write a book does not necessarily confer upon the author the power to read it in public? When will they come to see that, because a man has been most successful in cutting off other people's heads (for their misdeeds), he may yet not be able to lecture? Even Mauger had his limits, and there is a vast deal of difference between public execution and public elocution. It is quite possible that the deftest wielder of the axe or the noose may do sad havoc among an audience—with the jaw-bone of an ass.

It is, perhaps, more excusable in a secretary to suppose that a man possesses the "gift of the gab" who has succeeded in persuading somebody else's mamma that he is her son (to say nothing of sundry others who believed the story); but why, in the name of all that's awful, should an artist be considered capable of lecturing on no other recommendation than that of his pictures? Until the secretaries and others who are responsible for the choice of lantern lecturers begin to realise that lecturing is as much an art as any other form of public entertainment, and requires, not only the original gift (which is seldom given), but also a long apprenticeship and course of study, audiences will continue to be disgusted by the vain sputterings of duffers, and the illustrated lecture will never be freed from the stigma which is fast descending upon it. But, as the Romans of old used to say, "Experientia does it," and, before long, entertainment providers must come to see what is the real cause of their diminished audiences. Meanwhile there is, unfortunately, but little room for doubt that the lantern as an illustrator of high-class lectures is falling into disfavour.

Some say that it is owing to a temporary scare regarding the safety of the limelight that lantern entertainments are now so poorly attended, and that as soon as the scare subsides, audiences will return with whetted appetites.

That there has been a limelight scare there is, of course, no doubt, but all appearances point to the fact that it has existed, and does still exist, only with the lantern users—amateurs mostly—and audiences are quite unaffected by it. Several dozen cases are on record of the owners of gas cylinders sending them away immediately upon hearing of the Fenchurch-street accident, and one reverend gentleman has taken the precaution of having his gas cylinders buried several feet deep in the earth at a sufficiently safe distance from the parochial lecture-hall, whither the gases are conveyed by iron tubing. Truly it is better to "bury the bottle" than that the parishioners should come to an untimely interment, and it has the extra advantage of supplying a most excellent simile and object-lesson for the use of generations of tee-total talkers.

And this mention of temperance meetings—where the talk is usually anything but temperate—brings us round easily and smoothly enough to a consideration of quite a different phase of the subject; for, though we are fain to admit that the optical lantern as an illustrator does not now possess that popularity which of itself it undoubtedly deserves, yet, as a temperance tout and Christian converter, it is most decidedly in the ascendant, for, to bring cash to the Christian coffers, and "tin" to the teetotal till, there is nothing like it under the sun.

Let it not be for a moment supposed that any disparagement is implied regarding the employment of the lantern for such purposes, for it is but meet and right that the best of all we have should be devoted to the service of religion, and surely the lantern need not be ashamed to join issues with the king of musical instruments in such a cause, It is against the ghastly examples of the "art" of that fell destroyer of human peace, the commercial producer and colourer of lantern slides, that the strongest protest must be entered, for, among his very vilest productions—and is not their name legion?—there are none so bad that they will not do for temperance orations, while the "religious" figure subjects, though they are not worse, because that is impossible, are, from their nature, even more shocking to the sensibilities of the sensible.

It is proverbially useless to grumble unless a remedy be suggested for the state of things objected to. A few ideas are therefore submitted in all humility for the criticism of those whom this subject may concern, and it is hoped that, humble as they are, they may possibly serve as a basis upon which something more practical may ultimately be reared.

In the first place, it seems most desirable that there should be some kind of combination between the secretaries of the various institutes and

lecture-halls throughout the country, in order that they might compare notes and assist one another in the choice of lecturers. And why should the lecturer not be asked to furnish references as to capability? Such a course would save a deal of trouble and annoyance to the secretaries, though it would, of course, have the somewhat doubtful disadvantage of being an obstacle to the youthful and untried lecturer's progress. Such a one might, however, be allowed to spout for a given time before a meeting of delegates from the various institutes, and, having once passed successfully through that ordeal, he would have no more trouble.

To refer to the secretary of an institute where the lecturer had had a previous engagement would be a far more satisfactory manner of judging of his ability to lecture than to ask to see—if he be an artist—his pictures, or an executioner, his scalps; for such trophies, beautiful as they undoubtedly are in themselves, and excellent evidences of the artist's ability in his own particular line, are quite valueless as indices to his power to even briefly describe a set of lantern slides.

Again, would it not be possible to start a kind of inter-secretarial black list, whereon to write the names of those lecturers who "didn't oughter?" Or perhaps something a little more elaborate might be compiled in order to show the reasons of the lecturer's failure, and this would be fairer, because audiences in different places vary so much, that an entertainment which has fallen flat in, say, London, may, although given in a precisely similar manner in the Midlands, prove most attractive to the denizens of those parts. It may be urged, of course, that any lecturer who knows his business will be able to judge, directly he steps upon the platform, what kind of audience it is to whom he is speaking, and that he will be able to modify his discourse to suit his hearers. But it is also true, as all public speakers know to their cost, that there are audiences that care for no more intellectual entertainment than "niggers," and before whom no lecturer stands a chance of making his entertainment "go," unless he is prepared to black his face, take a banjo or auto-harp upon the platform with him, and to colour his lecture to match his countenance.

But, regarding the semi-religious form of entertainment, it is to be feared there is no remedy for the terrible state of affairs into which our poor lantern is here fallen; for it is one of the inexorable laws of Nature that those who have the bump of the knowledge of good and evil so abnormally developed in one particular direction should be quite unable to discern the quality of anything so mundane as a lantern or its slides. They are Salvation specialists, so to speak; they know and care nothing about the instruments they use, except perhaps their price; and, whatever else the religious lantern may be, it is always cheap.

And so, alas! it must continue to be the fanatic's faithful friend, the teetotaller's tout, and the collection cadger for all sects. And, if occasionally we hear of one unable to contain itself, as it were, which bursts itself and scatters dismay and perhaps death, around, let us not be too hard upon it, for a fellow feeling should always make us kind.

CECIL M. HEPWORTH.

POSSIBILITIES OF THE CARBON PROCESS FOR LANTERN-SLIDE MAKING.

[Autotype Notes.]

INQUIRIES are sometimes made as to the suitability of the carbon process for making lantern slides.

Seeing that the carbon process will give the most beautiful transparencies that can be produced by any process, it may fairly claim to give the best lantern slides if properly worked. Lantern slides are only transparencies that have to be highly magnified.

The weak point in the process is want of contrast, and therefore it is always directed to print only from negatives having strong contrasts.

When the carbon process was first introduced, it was claimed that, by increasing the amount of pigment in the tissue, almost any amount of strength in the shadows could be obtained. This is practically true for prints on paper, which are seen by reflected light; but any increase in the amount of pigment, over a certain quantity, is useless, as this increase would render the tissue obstructive to light, and therefore, would defeat the purpose for which it was intended.

It may be accepted as fact that only negatives having a good amount of contrast are suitable for lantern-slide making by the carbon process; it is, however, possible to improve most lantern slides that have been already made by this process. I shall refer to this later on, but will first, however, make a few remarks on the method of working the process for making lantern slides, and therefore advise those who intend trying it to adopt the following directions, which can be relied upon.

Procure ready-sensitised transparency tissue in sheets, 13 × 10 inches (each sheet will make one dozen slides), *and on the day the tissue is to be used* turn up the edges of each piece, so as to form a shallow tray, pin to a flat board, and coat with collodion. Dry in a warm room quickly. After trimming the edges with a pair of scissors, each piece must be laid, face up, on a zinc plate, and, with a zinc template, exactly 3¼ inches square, and a sharp knife, cut it into twelve pieces, and put them in a flat tin box. They are then ready for use. Mask the negatives with tinfoil on the film side, exactly three inches square.

Thin clear glasses, 3¼ inches square, are necessary for the final support; and the following solution will be required as a substratum, in order to ensure success:—

Water	1 pint.
Gelatine	300 grains.
Bichromate of potash	30 „

Dissolve and filter through paper or cotton-wool while hot, coat the plates in the usual way, and dry in daylight, taking every precaution possible against dust.

These plates may be prepared weeks in advance, but should be kept in a grooved box, and the greatest care must be taken that no rubbing or marking of the surface takes place to mar the beauty of the final result.

Print for about three times the length of time required for a paper print, with the same tissue, and, when ready to mount, place the exposed pieces of tissue, one or two at a time, in clean cold water (about 60° in summer and 70° in winter), till just flaccid; and remember that the time of immersion will be proportionately longer on account of the front being collodionised, and that absorption can only take place from the back of the tissue. At the same time place the 3¼-inch glasses in the water, and lift out with the tissue upon them, adjust position on glass, and squeegee. Lay between blotting boards for fifteen to twenty minutes, and then develop thoroughly; finish off with a jug of water at 120° to 150°. Dip again into the developing water, and then into cold water. Dry in a place free from dust, and in a fairly warm room.

If the exposures have been properly timed, the slides, when laid face down on white paper, will be quite white in the high lights; if, however, the white paper is degraded in those parts, the best effects cannot be expected, and such results will not fairly represent the suitability of the process for this class of work. Supposing that negatives having good contrasts have been used, no further treatment will be required, unless it be desired to modify the tone. This may be done by simply dyeing them in a solution of alizarine in dilute ammonia, followed by a dilute alum solution, or with sulphate of indigo for cool tones.

The best method known to me for giving great vigour and fine colour was published by me, ten or more years ago, in one of the photographic almanacs.

Prepare three solutions:—

A.

Distilled water	1 pint.
Silver nitrate	5 grains.

Dilute ammonia, just sufficient to give a clear solution.

Avoid a large excess.

B.

Distilled water	1 pint.
Citric acid	5 grains.
Pyrogallic acid	1 grain.

C.

Distilled water	1 pint.
Silver nitrate	10 grains.

Proceed as follows: Place the dry transparency to be treated in solution A for half a minute, and wash. Take sufficient of B in a glass measure, and add to it half a dozen drops of C, and at once flow over the slide; the effect is very rapid, and if washed off at once the colour will be warm, but, if the action is allowed to go on, the colour will become cooler. If the negatives used have a fair amount of contrast, this treatment will give the slides great richness when thrown upon the screen.

It has been supposed that the carbon process would not give sharp results, but that is a mistake. Some of the best slides ever made were by the Woodbury process, which gave results similar in character to the carbon process.

The method here recommended for making transparencies is certain in results, and, after over twenty years' daily working, I have no hesitation in saying it is the best possible process. I am well aware that substratums can be dispensed with, and so can collodion—*sometimes!* H. J. Burton.

A NEW INCANDESCENT LAMP.

The recent attempts to replace the ordinary oil lamp by the incandescent gas has but one drawback to amateurs, especially those who live in the country, where frequently gas is not obtainable, or of very poor quality. In France a new form of incandescent lamp has just been introduced, which is provided with a mantle like the Welsbach, but is not dependent on gas, but may be used with paraffin, or, better still, with methylated spirit, and a beautiful white, clear light is obtained at a cost of from a halfpenny to a penny per hour. We hope to be able to give a fuller description next month, with illustrations.

A HOME-MADE FLASH LAMP.

Having profited by the descriptions of devices and contrivances for increasing the capabilities, says Mr. F. J. Burnett in *The Photographic Times* and therefore the happiness, of the amateur of limited means, that have appeared in previous numbers of the *Times*, I am moved to give the readers of this number a chapter of my own experiences in evolving accessories, trusting the same may be of benefit to some of them who are obliged to look at both sides of their dollars before letting them go.

I do not suppose my flash lamp is unique, but I never saw one like it and never showed it to any one who had; it represents an outlay of thirty cents, and this is how it was made:—

A common clay pipe, of which I purchased two "fur a nickel" in Omaha, but which I believe can be had for a penny each east of the Mississippi, I stuck through a cork, which should be large enough so that a hole of sufficient size to admit the pipe stem will not weaken it seriously (the cork is the connecting link between the lamp and the handle or standard). Around the bowl of the pipe I wound a piece of lamp wick long enough to go three times around; this I held in place by winding a short piece of wire once around it and twisting the ends together. Over the end of the stem I pulled a piece of rubber tubing three feet long. This length is not necessary, but it is sometimes convenient to be able to hold the lamp at some distance from you. The cork I now stuck on the point of an iron office spindle; the other end of the rubber tube I attached to a bulb which I had; this, however, may be dispensed with, and the air supplied from one's lungs by blowing through a pipe, a convenient mouthpiece for which purpose can be made from a section of a rubber penholder, or the ferrule of a penholder or any similar tube. The manner of using this lamp is apparent: Put two or three pinches of powdered magnesium in the bowl, touch a match to the wick, upon which a little alcohol must previously have been poured, blow through the tube, and there is your flash.

The rubber tubing, which cost twenty-five cents, and the clay pipe are the only things I had to purchase. The cork and the lamp wick I got from the kitchen, the wire from the wood shed, the spindle I had; I believe a similar one costs five or ten cents.

Of course, the lamp must be reloaded for every flash, but a single flash I have found sufficient for an ordinary interior, or a group of ten or a dozen persons.

There are a number of ways by which it might be supported in place of using the cork and spindle, but they make a light and convenient handle and standard; the spindle is easily detached, permitting the lamp to be packed in a small space, and by unscrewing the base of the spindle the lamp may be tied to a cane or stick, and held above one's head for lofty interiors.

Of course, it should be extinguished immediately after each flash, else the flame, having consumed the alcohol, will burn the wick.

A "DANGEROUS" PRACTICE.

We subjoin the account of a case in which it was alleged that a lad struck a lady with an oxygen cylinder that he was carrying. The reported remarks of the witness and of the magistrate as to the "danger" of carrying cylinders of compressed oxygen are, to say the least of it, of an unwarrantably alarmist character:—

"William Mordy, a young man of respectable appearance, was charged with assaulting Miss E. S. Gladman. Prosecutrix stated that between seven and eight o'clock the previous evening, as she was walking along Waterloo-road towards home, a man slipped down immediately in front of her. Prisoner appeared to come up hastily, and, after making use of a filthy expression, struck her on the face with an oxygen gas cylinder which he was carrying. As a result, both her eyes were blackened and her nose bruised. He threatened to serve her sister in the same manner, and, a constable coming up at this juncture, she gave prisoner into custody. He appeared to be sober. Prisoner stated that the assault was quite an accident. He heard a disturbance behind, and, on turning round to ascertain the cause, the cylinder came in contact with the lady's face. He called a witness, who stated that the cylinder was five feet in length and six inches in diameter, and contained eighty cubic feet of gas. It was very dangerous to carry these cylinders through the streets, because, if they were dropped to the ground, an explosion would take place which would have fatal results. A man threatened to strike prisoner on the nose. Had he done so, accused would in all probability have dropped the cylinder, and he, with all the surrounding people, would have been blown into the air. Mr. Slade said the assault was very serious, and he would inflict upon prisoner the highest penalty, viz. 5*l.*, or one month in default. The magistrate directed the attention of the inspector on duty in the Court to the dangerous practice of carrying these cylinders through the streets, and requested him to report to the proper authorities."

We hope the "proper authorities" to whom Mr. Slade alludes will seek expert advice before taking the worthy magistrate's recommendation into consideration. If the public has a right to be protected from possible dangers, it has an equal claim to freedom from the thoughtless disturbances of panic-mongers.

SOUTH AUSTRALIAN PHOTOGRAPHIC SOCIETY.

At the October meeting Mr. R. W. Chapman, M.A., B.C.E., of the University, delivered a lecture on "The Composition of Colours."

He first drew attention to the composition of ordinary white light, by resolving a beam from the limelight into its component colours by passing it through a prism, thus obtaining a brilliant band of colours on the screen. He stated that colour bears the same relation to light that the pitch of a note does to sound, but proceeded to show that the effect of compounding colours was very different to the effect of compounding musical notes. The trained musical ear could distinguish every note of a chord, but the eye had no suspicion of the component colours that go to make up a mixed tint, as the same tint apparently might be composed in very many different ways. The effect of compounding coloured lights by reflecting beams from various portions of the spectrum was then shown, and by analysing the light passing through coloured glasses the nature of colours by transmitted light was exhibited. The difference between the colours obtained by mixing the lights that had passed through coloured glasses and by superposing one glass on the other was then shown by a series of striking experiments. Further experiments proved that white light may be produced by a mixture of two colours only, and that the eye could not distinguish the white light so produced from ordinary white light, The modern theory that the eye possesses only three separate colour sensations was then explained, all our notions of colour being due to the mixture of the three primary sensations in different proportions. Experiments on the compounding of colours by means of the colour top were shown, and the lecturer explained the practical application of the theory of three-colour sensations in Dr. Joly's new method of colour photography. He concluded by exhibiting some curious electrical effects produced on photographic plates.

Photographic Lantern Slides in Church.—The optical lantern is growing in popularity as an aid to pulpit exposition. At the old London City church of St. Mary at Hill, the Rev. W. Carlisle has used the optical lantern every Sunday evening for some years, and has by no means confined the slides to scenes from Scriptural lands. Current events and scenes, especially those which may serve to awaken a sense of Christian duty, are shown frequently, slum life being frequently illustrated and contrasted with life in the palaces of the rich.—*Thomas Bolas in the "Photographic Times."*

Acetylene for Illuminating Purposes.—We have in several issues of the *Bulletin* alluded to the new illuminant, acetylene. By the courtesy of Mr. E. N. Dickerson, we were able to see the practical application of this gas to ordinary illuminating purposes. The gas, in the liquefied form, was stored in an iron cylinder which was connected to a gas pipe, and the ordinary burners were used. The light given was simply superb, making the ordinary gas, burning at the same pressure, look ridiculous. The enormous advantages of this form of illumination are evident. Street mains are unnecessary, gas companies can no longer extort high prices for a miserable product, with a meter that does not measure, and a light of extraordinary power is thus placed at the disposal of any one in any locality. An acetylene torch was an interesting application of the gas. The price will, we believe, be considerably less than that of ordinary gas. We predict a revolution in house illumination.—*Anthony's Bulletin.*

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*February 7, 1896.*

THE LANTERN RECORD.

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THE SEARCH LIGHT.

I have duly received a beautifully engraved document which affords Sir H. Trueman Wood and Mr. Chapman Jones the opportunity of certifying that I have been elected a Fellow of the Royal Photographic Society. The certificate has a large red seal stuck in the left-hand bottom corner of it, and the total effect produced is as awe-inspiring as that given by similar examples of the engraver's art, patronised by the "Perseceutical"—I mean Pharmaceutical—Society, which you see in chemists' shops. If I were a professional photographer, I should frame my Royal Photographic Society certificate, and hang it prominently in my reception room; it might help me to get better prices and prompter payments. As it is, the document has found a place on the walls of my study, and is the admiration of all who are privileged to behold it. I have not spent £2 2*s.* for nothing.

* * * * *

I have been favoured with the first five copies of the reformed and rejuvenated *Photographic News*, now reduced in price to a penny, and appealing to amateur photographers. I search its pages in vain for the hand of the cynical and flamboyant "Ignotus," from whom last autumn I had the honour of occasionally differing, for he and the other features of the old *News* have disappeared, and in their place we have a bright, chatty, workmanlike little paper, judiciously edited, prettily got up, and supplying a capital pennyworth for amateur photographers.

* * * * *

The usual annual excitement about the Council election of the Royal Photographic Society, which takes place next Tuesday, has broken out among those members who are interested in the matter, Last year an attempt, happily defeated, was made to draft on to the Council a number of gentlemen whose qualifications for the position were that they were the nominees of a small group of worshippers of the Golden Calf; this year three or four old members are in danger of being displaced by new and untried men. On the whole, it is a pity that this agitation has arisen, for the good that is likely to issue from it is very doubtful, while the creation of some amount of bad blood and ill feeling is probable.

* * * * *

By the way, "Lictor," a reporter to an amateur contemporary, referring to the Council election, says: "It is a little difficult to appreciate the advice of our contemporary, The British Journal of Photography, though given *ex cathedrâ*, when in one paragraph we are warned against the machinations of a caucus, 'which in the cause of progress is trying to exclude from the Council a few of the older members,' and in another, immediately following, the hope is expressed 'that members will vote solid for the old Council.'"

* * * * *

The difficulty experienced by "Lictor" is one for which he alone is responsible. I turn to the passage in this Journal to which he first refers, and find it runs as follows:—"A self-elected caucus, however, has taken upon itself not only to run a candidate for the chair, but also, in the cause of 'progress,' is trying to exclude from the Council a few of the older members, *who have been re-elected for a good many years, but whose further presence on that body is supposed, in some mysterious way, to interfere with the progress of the Society—and photography.*" "Lictor" not merely omits the quotation marks given to the term "progress," but, in suppressing the words I have italicised, lays himself open to the accusation of not being able to understand what is aimed at in the Editor's remarks, viz., that it is doubtful if the "progress" of the Society is prevented by the presence on its Council of a few old members. Again, if "Lictor" is anxious to publish to the world the uninteresting fact that he is a stupid person, and unable to read, he is under no obligation to demonstrate that he is also poor-spirited enough, in order to secure a point, to mutilate his quotations, and draw therefrom dishonest and indefensible deductions.

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By the way, a rumour reaches me that there is a secret plot, having for its object the endeavour to prevent the re-election of members of the Press, "as it is undesirable to have them on the Council on account of their connexion with the photographic journals." My information comes from a trustworthy source, and, as a similar, but abortive, attempt was made last year to boycott those who were suspected of an ambition to prevent the Society from becoming the mere plaything of a few gentlemen from South Kensington and other aristocratic parts of London, I have little difficulty in crediting the rumour, extraordinary as it is.

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On what grounds a representative of the Press is an "undesirable" person to be on the Council of the Royal Photographic Society I am at a loss to understand. Assuming for argument's sake, however, that some valid objection can be advanced against the presence of the fourth estate on the Council, let us see, from the composition of the outgoing body, against whom the agitation is directed. The following members of the old Council are "connected with the photographic journals:" Captain W. de W. Abney, C.B., Mr. Chapman Jones, Mr. Andrew Pringle (all three being editorial contributors to *Photography*), Mr. Thomas Bolas (connected with *The Photogram* and *The Amateur Photographer*), Mr. Thomas Bedding, Mr. T. C. Hepworth, Mr. E. J. Wall; while at least *four* other gentlemen, whose names I withhold, have, to my knowledge, a more or less

direct connexion with the photographic press, which brings them under the ban of the conspirators. The movement, therefore, is, *or should be*, levelled against ten candidates for re-election.

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But, as a matter of fact, out of ten journalists, only two are aimed at by this truly heroic and consistent clique. It is a graceless and paltry agitation, inspired by ungenerous motives, buttressed by narrow-mindedness, and crowned with ingratitude. The present prosperous condition of the Society is not inappreciably traceable to the personal and professional efforts of some of the photographic press, who have given much of their spare time and energies to forward its interests. This Journal in particular, during the past four years, has backed up the Society through thick and thin. I am quite sure that anybody connected with it who happened to have a seat on the Council would "stand down" if it could be shown that such a course would benefit the Society and it was the wish of the members; but I am equally sure that the Society would not benefit thereby, if such a result was brought about by underhanded means, and that the great majority of the members will not approve the tactics I have referred to, whether they are successful or not. Radiant.

LANTERN MEMS.

Parliament is to reassemble on the 11th inst., and then, among other items of interest to be made known, even though it should not find a place in the Queen's Speech, will be one of marked importance to the lantern world, viz., the publication of the report of the Home Office Committee on the gas-cylinder question, and the use and conveyance of compressed gases. I understand this is already printed, but, according to custom, cannot be published except it passes through the recognised channels. Verily, official ways are wonderful.

* * * * *

It is just a year since the trouble to the lantern world and gas-compression industry was caused by the deplorable accident at Fenchurch-street Railway Station, and it has taken all this time for officialdom to arrive at a decision as to how, when, and where compressed gas may be used and conveyed, and what kind of cylinders can be employed for the purpose. I venture to think that any commercial concern would have fully investigated the matter and arrived at logical and practical conclusions in two months at the longest, with the aid of experts in engineering and chemistry, which are likewise available to the Government.

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The havoc played with the lantern trade during this season must be largely attributed to the delay in the publication of the official report on the compressed-gas question, for, although the precautions taken by the gas-compression companies are such that those who have gone into the matter recognise as sound and satisfactory, yet the general public are slow to forget a matter that affects their safety, and consequently many who thought of purchasing limelight apparatus deferred doing so until some authoritative statement was made. The season, unfortunately, is best part over before any announcement is made, and manufacturers suffer in consequence.

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I don't think I am wrong in saying that, notwithstanding the "boom" in jets, high pressure of wonderful candle power, injector jets, and oxy-ether saturator jets, the number made this season will not at all compare with those made last. Many lanternists may, of course, be content to use the incandescent gaslight, and others be fortunate enough to have electricity laid on, and so avail themselves of the electric arc light; but, even putting a fair number down for these two classes of lanternists, there is still a big deficit in trade.

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The mention of the incandescent gaslight reminds me of an American patent taken out and published for the manufacture of indestructible mantles, or at any rate, if not indestructible, so made that they can be handled. It consists of oxide of thorium, oxide of didymium, and oxide of lanthanun. They are mixed into a dough consistency with liquid glue, and then forced into threads and woven. These are duly supported on a platinum or fire-clay mould, dried, and incinerated. The yellow light desired by some users of gas in preference to the light of the Welsbach light is obtained by didymia, but not more than five per cent. must be used, or the light will be too yellow.

* * * * *

According to decisions on patents in connexion with mantles for incandescent gas lighting, it appears that Auer Von Welsbach was not the inventor of the incandescent gaslight, but he so far improved the method of producing it, that, while he uses the salts from the earth metals only, his patent remains good. A final appeal is, however, to be made to the Imperial Court to see if the decision of the Patent Office will be upheld. Another patent has been allowed by the Board of Appeals of the Patent Office, and this is for a hood formed by an electrolyte of the nitrates or sulphates of earth metals. It appears a finely woven platinum conical hood has deposited on it by electricity a mixture of these nitrates and basic earth salts, and this is then converted into oxides by calcination. The resultant is a hood that gives a splendid light when used over a Bunsen burner, and, moreover, can be handled, and, if pressed out of shape, easily reshaped.

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This looks as if the future of incandescent gaslighting would be a grand one, for with a platinum base there should be practical indestructibility, and the cost of production is said to be such that they can be sold quite as low, if not lower in price, than the present ones. For lanternists it may lend itself to being supplied with oxygen gas, and thus a greatly improved light obtained for special work. Our old friend the limelight will want a lot of beating for projection work, especially now the "injector" type of jets permits of such powerful light being obtained with the ordinary house gas as supplied at low pressure, and oxygen gas at high pressure from a cylinder. It will be found that the best results are obtained with these jets by leaving the taps of jet fully open, and regulating the supply of gas by means of a fine screw-down valve on the cylinder.

* * * * *

The "New Light" is on all sides the feature of the hour, and the lanternist, if he wishes to be "up to date" must have some slides of the wonderful shadowgraphs produced by the X rays discovered by Professor Röntgen. I noticed the other evening at the Royal Institution the negatives and prints on view in the library, as well as the lantern slides taken from subjects of a similar class to those experimented on by the originator, were the subject of much comment and interest. The results clearly show that there are few things in nature really opaque, and, just as coal, stone, and wood, if the section is thin, can be seen through when placed under the microscope, and ordinary daylight or limelight used, so flesh, leather, wood, vulcanite, and aluminium can be penetrated by these mysterious rays, and, given a certain time and a limit of thickness, an impression can be made on a sensitive plate. As ordinary simple spark apparatus can be used for this work, the numbers of experimenters in this direction will be legion, and the results will be anxiously awaited by the scientific and lay world.

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Among the many interesting things in the reprint of the first number of the *Daily News*, published on the occasion of its jubilee on January 21, is an advertisement of the Royal Polytechnic Institution. It runs as follows: "The lectures selected for this period of the year by Dr. Ryan and Professor Bachhoffner in chemistry and natural philosophy will be illustrated by interesting and brilliant experiments. A lecture on the prevalent disease in potatoes will be delivered by Dr. Ryan and also on the atmospheric railway by Professor Bachhoffner, a working model of which, carrying several persons is exhausted daily. The additions to the opaque microscope, dissolving views and chromatrope are very effective. The physioscope" . . . .

To read this after fifty years causes one to reflect, and, in analysing the above, that which stands out prominently, or appeals most strongly to a lanternist, is the part referring to the opaque microscope. How often is a projection microscope shown in public at all now, and especially an opaque microscope! I feel, however, that there is a large percentage of the present generation who would be as much entertained now by a good microscope and popular living and other objects, as their parents were before them in 1846.

* * * * *

Such lectures as have lately been given by Professor Stewart at the Royal Institution will do much to popularise the microscope, and I am glad to see the newspapers are reporting them in an interesting manner, especially the *Daily Graphic*, its heading of "Armour of Flint," and "Jaws in the Stomach," being very *apropos* and catchy, and likely to cause lay readers to take to microscopy.

G. E. R. Baker.

THE LUMIÈRE KINEMATOGRAPH.

[Photo-Gazette.]

We have on several occasions brought chronophotography under the notice of our readers, and have successively described in these pages M. Marey's apparatus for studying objects in motion, M. Demeny's for projecting living scenes, and, more recently, the same inventor's hand camera, bringing chronophotography within the scope of the amateur; and, lastly, Edison's kinetoscope, which is now seen to some extent everywhere.

Messrs. Lumière, the well-known plate-makers, have just made an

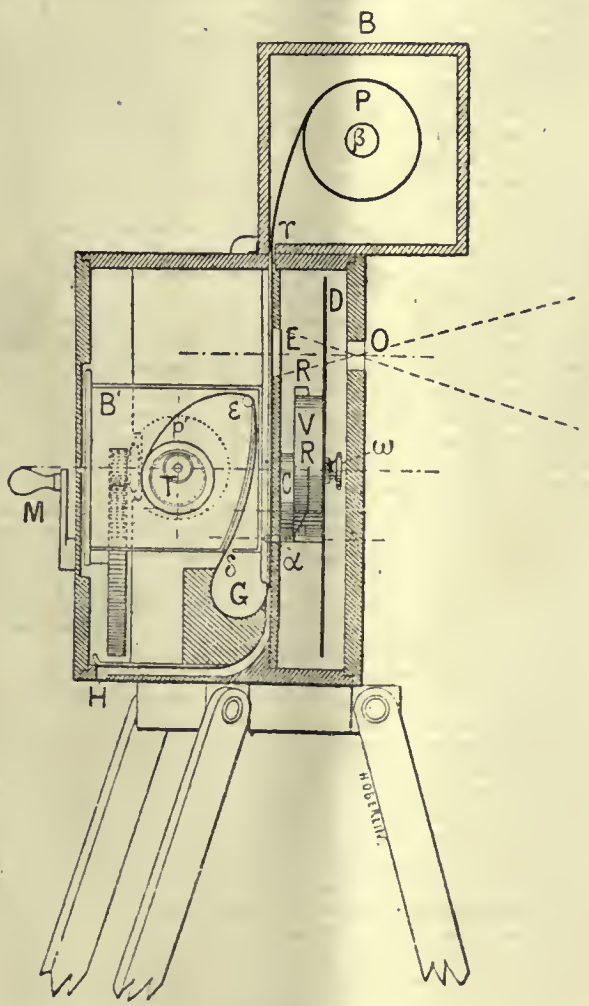


Fig. 1.

instrument founded upon the same principles as these different inventions, but which has the peculiarity of being reversible; that is to say, 600 to 800 exposures may be made upon a band of film, and, after a positive has been made upon another similar band, the scene in motion may be projected upon a screen and exhibited to a large assembly.

During the last few days a series of photographs, thus projected, have been shown in Paris with great success. The first picture is thrown upon the screen for a moment; then, suddenly, the figures begin to move—carriages, a tramcar crossing a large square, &c.; nothing could be more striking, more unexpected than this sudden transition into life of the photographic image.

Our friend, M. L. Oliver, editor of the *Revue Générale des Sciences Pures et Appliquées*, has kindly lent us the drawings, which he has

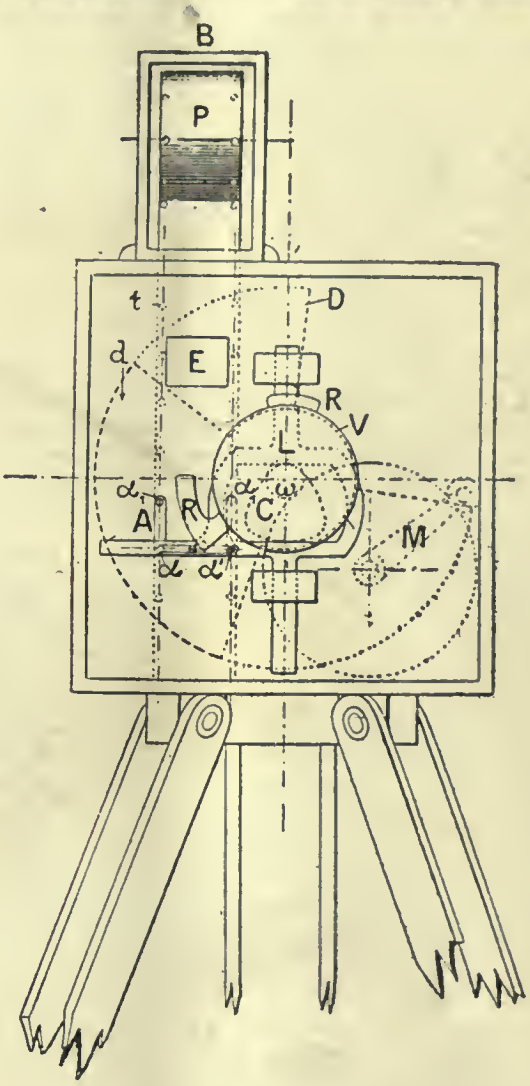


Fig. 2.

had prepared, of the apparatus, and which we shall now use for giving a description in detail.

The band of film follows the same path, whether it be a sensitive band for making a negative or a positive band used for projection; in the latter case the back of the apparatus is removed, and a strong beam of light is thrown upon the band.

Only one description is, therefore, necessary to make both functions of the apparatus understood, either as kinematograph or kinematoscope.

The band of film enclosed in B (figs. 1 and 2) is fifteen metres long and three centimetres wide; it is perforated near both edges with equidistant holes situate at the extremity of each image; the pictures taken at intervals of one-fifteenth of a second are exactly similar, that is to say, if two pictures be superposed, those parts representing stationary objects will exactly coincide, and the parts

representing moving objects will be so situate that they represent the change that has occurred by movement in the interval between the exposures.

This band, P, rolled on a spool (figs. 1 and 2), passes through an opening, *y*, descends vertically, then passes an aperture, E, in front of the lens situated at O; thence it goes into the recess, G, to pass upwards over a small rod, E, to be carried on to a spool, P', rotating on the axis, T.

The handle, M, turned by hand, rotates the spool by a system of cogs, and at the same time turns the arbor, *w*, of an eccentric, C (shown alone, fig. 3), and imparts a go-and-return movement to the frame, L, vertically.

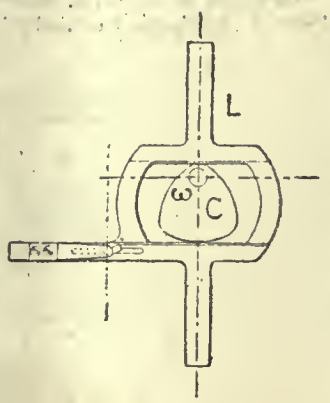


FIG. 3.

From the form of this eccentric it will be seen that a regularly increasing speed is imparted to the frame, and that it decreases in like manner, and that there is a rest at each end of the track. This rest is necessary to allow two small hooks, X and A', carried by the frame, to pass through, and return from, the holes along the edges of the band. The hooks are attached to the springs, A and C; two inclined planes, R, upon which they slide, remove them from the film when the frame, L, is at the lower extremity of its path, and they allow them to approach and engage with the holes when the frame is up. It follows that the band is drawn along the path of the frame in equal sections, and that it remains stationary whilst the frame returns. The length of the picture is, therefore, exactly that of the path of the frame.

The moment the film is at rest a shutter of a disc, D, also moved by the same handle, presents its open section to the lens and effects the exposure. The light passes in either direction, whether for photographing or for projection. The opening in the disc may be regulated at will to diminish or increase the exposure as may be found necessary. In order that the film may be rolled up continuously on the spool, P', which receives it, the film at E passes over a rod mounted on a light spring, by which sufficient elasticity is imparted to compensate for the intervals of rest caused by the eccentric. But this arrangement, which is quite indispensable for making exposures, because the film, must then be perfectly guarded from light, may be dispensed with when transparencies are projected. In practice one may dispense with the drum, P', in the latter case, and allow the film to pass out of the apparatus. The periods of rest are indispensable for exposure in making the negatives in order that the pictures shall be sharp; it is not, however, necessary that the lens be uncovered by the shutter during the whole period of rest, and the aperture in the disc may be regulated and reduced even to a narrow slit. The pauses are none the less necessary for projection, to enable sufficient light to pass. One cannot use too much, and the aperture of the shutter may be opened to its fullest extent. It suffices if the pictures follow each other at intervals of one-tenth of a second; they will then unite and give the idea of movement, owing to the persistence of vision.

SMASHED LANTERN CONDENSERS.

Now that the electric light is being so commonly employed for lantern projection, we may expect to hear of more cracked condensers than of yore. Some lanternists seem to be most unlucky with regard to accidents of this nature, while others enjoy perfect imunity from them. We suspect that care in lighting up, and in avoiding draughts of air after the jets have been turned off, may be the secret of this freedom from breakage. But other precautions may, with advantage, be taken by those who wish to preserve their condensers, one of which consists in having a flannel cushion to place against the glass after use, so that it shall not cool too quickly. We need hardly mention that the glasses should be loose enough to rattle in their cells when cold, and then there is no fear of their breaking by their own expansion when hot. When using the arc light the condensers should be protected by a curved screen, with its concave surface towards the light, for the carbons have a tiresome way of spitting out particles of incandescent matter which, if they do not break the condenser outright, will pitt and roughen its surface.

We may mention, in this connexion, that Mr. Ives, who has devoted much attention to lantern matters, supports the back glass of his condenser at three points only by means of brass catches attached to springs. He lately told us that before he adopted this plan he lost many condensers by breakage, but that since he has used these spring clutches he has been quite free from such vexatious disasters.

COMBINATION PRINTING OF LANTERN SLIDES.

THE combining of two or more views into one lantern slide is an operation but seldom undertaken by amateur workers, and, in fact, is one which is more often passed on to the hands of professional slide-makers than any one else engaged in the ordinary practice of photography, the reason for this being, no doubt, that such an operation requires at least some amount of special experience at this particular work, which entails a fair amount of neat-handedness, combined with a supply of special apparatus, but seldom at the command of those who do not give particular study and attention to this class of work.

Among amateur workers, no doubt, many experienced slide-makers could be found who have never made a combined transparency, nor ever seen the operation performed either. Although at the same time such may have a perfect idea of how such pictures are produced, still, from, very possibly, a want of some piece of apparatus, they never care to undertake the making of combined lantern slides. Others, again, look upon the operation as one of great difficulty, entailing an amount of experience quite beyond the limits of amateur workmanship. In point of fact, however, such is not the case, and, in the remarks which I am about to offer on this subject to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY I hope to show how easily any one who has experience of making lantern slides by reduction through the camera, may produce combined slides also, provided they give a fair amount of close attention and bestow a little amount of neat-handedness when undertaking this class of work.

To make combined slides from two or more negatives, the first essential is suitable apparatus, but this need not be in any way an elaborate or costly outfit; as a rule, any ordinary copying box, capable of holding varying sizes of negatives *in situ* for the purpose of being reduced or enlarged, will be found amply sufficient for the work, and, no doubt, copying boxes of this description are now in the hands of nearly every amateur who aspires to the honour of being an expert slide-maker. To such, however, as may not have such a box beside them, perhaps a brief description of how any one can make such themselves, at a mere bagatelle in the way of cost, may be of interest.

A very useful size is one that will carry any dimension of negative up to 12 × 10 inches. Let this be a square box with top and bottom knocked out, at one of the open ends, nail strips of wood to act as a groove, so as to permit the largest size of negative, and also carriers, to slide easily into the grooves. A nest of carriers for each of the stock sizes of plates will complete the box, and such is easily produced at home by any one possessed of even the crudest ideas of carpentry.

Having provided a suitable copying box, the next requirement is a good copying board; this is of great service in permitting the camera and box being placed at proper distances from each other when the ever-varying sizes of reductions and enlargements are being registered exactly on the focussing screen of the camera. A very useful size is one of eight feet long by about twelve inches wide, and made in such a manner as not to warp or twist, otherwise the camera and box will not stand flat upon its surface. When such has been provided, at spaces of every six inches or so, rule or scrape across the top of the board lines at exactly the same distance, the same as a foot rule registers inches; this will be found of great service in permitting the camera to be placed square on to the negative in the box, and so prevent any distortion in the pictures.

The next essential is the preparing of the ground glass, or focussing screen of the camera, with a special set of guides for this particular class of work.

The first essential is to find out the exact centre of the dark slide of the camera it is intended to employ in this work. One and the same slide should be always used, and, when this slide is fitted with its carrier for

the lantern size of plate, attention should be given to see that the aperture of this cut out is not too large, but of the exact size to carry the 3¼ × 3¼, or lantern size of plate, without the same moving in any way when such is placed in the carrier; this is very important, for, upon the sensitive plate always occupying exactly the same position in the camera when the dark slide is inserted, depends the entire success of the operation. Any carrier that permits of the plate moving from one side to another should be discarded as quite unsuitable for the work, and, when such is found, it should immediately be doctored by gluing to its side small pieces of cardboard, until the lantern plate just sits snugly in its place. The springs of the dark slide should be firm enough to keep it from falling backwards, also a precaution necessary to observe when at times the copying board is pointing upwards to the sky.

Having selected a suitable slide, and fitted to the same a good carrier as described, the next step is to find the exact spot on the ground glass of the camera that exactly coincides with the true centre of the cut-out aperture of the carrier in the slide, and, until this has been discovered and truly marked upon the focussing screen, it is no use attempting to register correctly any combination of negatives on one and the same sensitive plate.

There are several methods of finding the exact centre of the sensitive plate when the same is contained in the carrier of the slide, and perhaps the simplest to describe is the following:—Place a sensitive plate in position, and then rule diagonally from top to bottom corners of the plate; where these two lines cross will be the exact centre of the plate, and some means must be found to find and mark the exact spot upon the focussing glass, that coincides with the centre of the plate, when the same is pushed home in the carrier for exposure of the plates. Once found, this is known for all time coming when the same slide and carrier is used; hence the desirability of allotting one slide specially for this work.

To find the exact spot on the ground glass that just coincides with the centre of the carrier, perhaps as sure a method as any to adopt is to rule diagonal lines also on the focussing screen, and then, by exposing a few trial plates, it will soon be found if the spot where the diagonals cross on the focussing screen exactly correspond with the diagonals on the sensitive plate; in practice it will be found that some slight allowance will require to be made from these points with most cameras, but, once the true spot is found, it is easy to keep to it for all future time.

From this true centre several circles of varying sizes or diameters should be ruled on the ground glass, commencing with a very small one, and terminating with a larger one the exact size of a cut-out round mask, which it is intended to adopt as the size for mounting and finishing the slide.

These centres will be found of the utmost use when varying sizes of images have to be printed in exact positions on the sensitive plate; in fact, they are indispensable for exact registration.

Having such apparatus at command, the production of combined lantern slides becomes a matter of ease, only requiring the exercise of a due amount of care when registering the various negatives on the ground glass, and the exercise of proper judgment in the exposure of the sensitive plate to the different densities of the negatives that are being used, so as the development of the various exposures will all come along together, and finish in something like the same manner, as regards detail and density.

In most lecture sets a good introductory slide is always appreciated by an audience, and a good start is of the utmost importance with most lecturers. As examples of combination slides and a description of how these introductory transparencies are produced will probably prove of interest to our readers, a detailed description of the method employed in making the same will be appreciated.

Individual taste must always be observed more or less as regards design; but in most instances, when furnishing introductory slides for lecture sets, some of the more interesting or particular view of the sets are generally selected to form the combination slide, with perhaps a bold titling describing the name of the lecture. Surrounding these various selected views, and in the remarks which I am about to offer, it shall be my aim to describe, as plainly as possible, how any one should set about making such a slide.

At the outset any lettering or printing which has to be included in the picture should be first produced on a clean white card; this may represent the name of the lecture, and may assume any shape or form according to taste, provided the design is such as will permit suitable spaces for the printing of the little views that have to be placed alongside such titling or lettering. As a general rule, the extreme edges of the slide carry these titles, the form of which may be either round, square, cushion or other shape according to taste; this will leave the centre clear and suitable for the reception of as many little pictures as may be desired to illustrate the coming lecture.

Let us suppose it is decided to adopt a round shape. In which case, let the operator pay a visit to his nearest ticket writer, and get him to describe a true circle in black ticketing ink on a pure white card; outside this circle get him to print, in good bold characters, the title of the lecture set; this provided, let a good negative from same be made—by a good negative I mean one absolutely opaque as regards the whites and almost clear glass as regards the black lettering. If an operator cannot do this, he should practise black-and-white working until he can. In some cases recourse may be had to absolutely blocking out all but the lettering, so as to provide a negative through which no light will pass on to the sensitive plate on those parts that must be reserved for other negatives. On the production of an absolutely opaque black-and-white negative for this purpose much of the success in results will depend.

Having provided a suitable titling negative, the next step is the selection of the illustrating negatives, and these may be of any size or density; in fact, just ordinary stock negatives may be utilised, provided a copying box, as previously referred to, has been supplied.

In my next I hope to refer to the various manipulations necessary so as to combine these negatives into one and the same slide.

T. N. Armstrong.

THE CAMERA IN NEW ZEALAND.

[Sharland's Trade Journal.]

Among Whales and Whalers.

The stranding of twenty-seven whales at Murewai, on the west coast of Auckland peninsula, just between Waitakerei and Kaipara, brought almost to our doors an unexpected opportunity for securing some great subjects for the camera; as in these dull times the demand for novelties is unabated, here was a splendid chance for adventure.

Although the railway runs along within about ten miles of the coast, the track to the stranded monsters was very rough, with no friendly shelter or food supply on the way. Yet some of the more hardy and determined of our Auckland camera men faced the trouble, and in heavy marching order, with a heavy *pikau* of gear and tucker, bravely attacked that muddy track. Fortunately they found some tents on the beach, and made themselves at home, roughing it with the whalers, who were making the most of the

Flotsam and Jetsam

on the beach.

Several very good negatives were secured of the novel scene. The stranded whales were half buried in the sand, and the work of saving the blubber, boiling down and filling casks with oil, gave life and interest to the pictures.

After the mid-winter season, the whales returning from a cruise in Antarctic waters coast along the shores of New Zealand, often quite close to the land, on their way to warmer seas, and these had probably been driven by bad weather out of their usual course.

On the east coast of the North Island the whales' homeward track has been observed to pass close under Cape Brett, and Messrs. Cook Bros. determined to attempt their capture here by means of nets stretched across the whales' line of progress, and we are pleased to say that the greatest success has crowned this bold and daring enterprise.

Whales Caught in Nets.

This seemed to promise an adventure with results even better than stranded whales as novelties in photography—at least so thought our friend, Mr. Tom Ryan, who, scenting here a rare kind of sport, not unmixed with hard work and no little danger, determined upon putting his aquatic experiences to the test, and, armed with a hand and a whole-plate camera, he made for the scene of action.

It was no good waiting for good boating weather, as the whales did not object to wind or rain; so, after a pretty rough experience of one of our winter storms, he reached the whaling ground, and was welcomed by the whalers with hearty hospitality.

Here is the log of his

First Day's Work,

in which our friend did his full share at the oars, exposed to wet and cold, with little food and no shelter, and on one occasion at least for sixteen hours at a stretch:—

"The first morning at 5 a.m. a terrible noise was heard. I woke up with a start, and thought that a bull fight was on. It was pitch dark, so I looked outside in some trepidation, and heard voices of natives shouting here and there. Knowing the Maori lingo, I soon ascertained it was only

'Charlie,' the cook, blowing the horn to call the boats' crews to breakfast—5 a.m., just fancy what an hour for a mid-winter breakfast! I tumbled up, however, and had breakfast, and then set off to the jetty to ship in the whale boats for the day's work. Our crew were all natives except Bert Cook and myself, and our boat was pretty full, for the nets were on board coiled up in a huge bundle fore and aft. We had three sections of net on board, with numerous twenty-gallon kegs for buoys. The sea was beautifully calm, and we rowed along swiftly under the frowning masses of cliff, which is characteristic of this wild part of coast. We arrived off a large rocky reef, and then proceeded to set the nets, which, by the way, are no small things. There are five sections, ten fathoms square in each section, which gives altogether a total length of 1000 fathoms of whale line. The mesh is a six feet square one, and, when one comes to weigh up the line and various appendages, it is no wonder the whale boats float very deeply.

"Setting the Nets.

"The mode of setting the net is thus:—A stout fixed line is made fast to the rocks, and it is then carried sixty fathoms, out to sea, where it is fastened to a large buoy moored to a half-ton mooring. The boats pick up this strong line, and then proceed to tie the net to it by means of stops, and pay it out. These sections are now temporarily lashed together with a piece of rope yarn, so that when a whale get meshed, he breaks away the section which has caught him from the other sections, leaving them intact. All the net being paid out, an inspection is made as far as possible to see if the net is hanging all clear and not tangled. An adjournment is then made shorewards to get a landing on the cliffs, which is managed with a bit of manœuvring, as the heavy ocean roll always makes a nasty surf here.

"Whilst we are having 'tucker' one of the Maoris cries out 'Blow!' and we are all in a buzz of excitement, as two whales are seen approaching not half a mile away. The boats are manned as rapidly as possible. The whales still keep on their course, heading well inside the net. If they keep on the same course, the capture of one is a certainty, so the line is bent on to the harpoon, and the boat steerers in both boats are standing up ready as the whales approach the nets, heading right into them. We now are filled with excitement, every eye being on the buoys.

"A Double Catch.

"The next minute two of them disappear below the surface of the water, then two more follow amidst a cheer from both boats' crews. 'Dube?' exclaims Bert Cook, meaning that two whales were meshed. We now strain every muscle on the oars to pull up the whales, who are now lashing the sea all round into a fury of foam. The other boat singles out one and chases it, whilst we chase the other. A sharp spurt of half a mile brings us up to our whale, who is lashing out with his flukes in all directions. Under the skilful heading of Bert Cook we range up near the whale, getting smothered with spray through his kicking. 'Stand up, Warren!' shouts Bert to the native boat steerer in the bow, and our man is ready in an instant. 'Now, then, strike!' rings the cry again from Bert; then our boat steerer, a strong, athletic man, sends the harpoon deep into the side of the whale, who marks his disapproval by a most determined lashing of his flukes.

"'Come aft, Warren!' shouts Bert to the native, who, quick as a cat, hops from thwart to thwart and takes the steer oar from Bert, who now rushes forward to where the lances are kept.

"We 'peak' oars, and the whale sounding, the line runs out of the tub at an alarming rate round the loggerhead with an unmistakable smell of something burning. It is caused by the friction of the line round the loggerhead, so a bucket of water is thrown over the line to cool it. Down, down, he goes, 20, 25, and then 30 and 35 fathoms line out, when it eases up a bit.

"'He's coming up,' shouts Bert. 'Haul on the line,' is the order; so we start hauling on something different to a schnapper or hapuka.

"Now we commence to travel quicker, for the whale is rising rapidly, We haul every man for all he is worth, when up comes the whale about thirty yards ahead. We haul our hardest so as to be up close to him next rising, which we do. We get pretty close, when Bert, who has now the deadly lance unsheathed, standing erect, delivers a blow into the whale's side. The lance sinks deep into the flesh and out pours blood. The lance, being hauled out by means of the warp attached, is thrust in again and again, each thrust being the signal for renewed furious lashing of the flukes till he goes down. He now starts running, as the lance wounds have pricked him up a bit.

"Sixteen Miles an Hour.

"We hang on with the line round the logger, and away we go in tow of the whale, travelling about sixteen miles an hour, a great wave of spray being thrown out from each side of the boat, wetting us through. The truth of my friend's words as to the spice of danger was now dawning upon me. I had time to recover from the first burst of excitement, and here we were, fast behind a whale, travelling goodness knows where. On looking round we were well off the coast. We just could make out the other boat, still fighting their whale, all safe. Up comes our chap again, and we once more 'haul line.' We get up close to him again, and once more the deadly lance is at work, two more thrusts, and up shoots a column of deep red blood from the nostril of the whale. An expression of delight bursts from our crew, for a whale spouting with blood is an indication that he is mortally wounded by the lance. He seems now thoroughly flurried in his actions, and the succeeding lance thrusts make the huge carcase twitch and tremble from end to end. The whale shows no desire for 'further sounding,' preferring to remain just below the surface of the water.

"Death of the Whale.

"As he is spouting blood and not travelling, it is no use mincing his body with any more lance thrusts, so we have just to wait and see him die, which sometimes is a very slow process. We waited about half an hour, the whale just bobbing up and down, when all at once he makes a furious kick, and, raising his head clean out of water, rushes shorewards at an alarming rate for about half a mile, when he suddenly stops and lies quiet for a while. A few more small spasmodic kicks, and then the drama of the sea is finished as far as his whaleship is concerned. He turns over on his side with a fin partly out of water and dies, lying motionless just awash with the water. We haul up on the line right alongside and immediately cut the net away. It is an awful tangle round the body. After a good deal of labour we get it into the boat, and then we find the buoys are completely stove in, either with the great pressure below the water or through getting kicked by the whale.

"The next thing is to fasten a tow line, which is made fast to the two jaws, which are drawn together so as to prevent the mouth opening. Everything being ready, we start towing, which is slow work with one boat; but the other boat, having killed their whale close in shore, anchor it there and comes to our assistance. It is a good long way to the harbour, but, both crews being willing, we make rapid progress, eventually landing the whale at the wharf after a good tow of nearly six hours. On the way in we were followed by numbers of 'gonies,' 'stinkpots,' seagulls, and other birds, all intent on having a good feed off the blubber of the whale.

"Once on shore again, we are around the tea table in no time, with a very, very good appetite after the hard day's work. It was nine o'clock when we arrived at the wharf, sixteen hours in the boat with a little lunch and plenty of hard graft. Think of that, ye eight hours a day men! We were one and all soon asleep, only to be roused at 5 a.m. again by Charley's confounded horn-blowing for breakfast."

But the narrative as given in detail, with illustrations reproduced from the photographs, in the *N.Z. Graphic*, does not tell of the dangers of landing from a whale-boat on a slippery ledge of rock washed by the surging Pacific; of the perils to operator and apparatus, as riding in on the crest of one wave he leaps ashore, and with scarce a foothold scrambles up the wet and slippery steep. Then the boat draws away and comes in again on another wave, when the tripod is thrown up on to the rock. Next time the camera in its travelling case is thrown up—

A Good Catch!

in which our friend's experience as a football athlete comes in opportunely. Next, the package of dark slides is as well caught, and, as a whale is already in sight, it becomes very trying to one's nerves to fix up and get ready for a shot. Just when all is ready, drawing the slide shifts the legs and disarranges the focus, and there is no finder on the camera. To do it all over again in haste and steadily is very trying to one's patience, but, as our artist is nothing if not calm, he has everything soon fixed again, as in a moment of intense excitement off goes the shutter, just as the whale charges and takes the net away with him; again reverse the slide to get him as he comes up. Then "Hurry up, my lad, into the boat and after him." To get that camera packed again in less than a wink, and all snug on board before you could say Jack Robinson," without leaving even a stop behind, is itself a feat worthy of renown, but it had to be done, or our photographer would have been left on that rock till the boat's return.

Presently he gets a snap-shot with the hand camera, as the monster, lashing his enormous tail with terrible fury, dashes into the air its encumbering mass of cordage, floats, etc. Then again another shot just as the harpoon is thrown, and several other instances are snapped at, but just as a whale makes a clean breach out of water—like a mullet at play—the shutter sticks, and this, the only chance, is lost. Fortunately Mr. Ryan's artistic genius was equal to the occasion, and he easily made good

the deficiencies of the camera, and was also successful in getting many valuable negatives of the various subsequent operations. If any of our young enthusiasts wish for a week of rare sport, hard fare, long hours, plenty of real hard work, and the finest trial of patience, tact, and temper, we would recommend them to follow Mr. Ryan's example, only don't be afraid of getting wet, and be sure that your apparatus is waterproof; also be not disappointed if under the circumstances none of your negatives are perfect, and none of your pictures of any great commercial value.

JOSIAH MARTIN.

THE ILLUSTRATED LECTURE.

[The Exhibitor.]

THE illustrated lecture has assumed a unique position in the entertainment world. With few exceptions, lectures illustrated by means of the stereopticon are more popular and draw larger audiences than those where this adjunct is not employed.

Pictures are an attraction to old and young and a description can be made much more satisfactory if accompanied by a view of the place or thing described. A double advantage is secured, as both eye and ear are addressed at the same time.

The use of the projecting lantern for the purpose of illustration has grown to large proportions within a few years, and is still increasing. In view of this fact, it may not be out of place to offer a few suggestions which may have some influence on those who contemplate entering upon this pleasant, and, if properly managed, profitable phase of public work.

In the first place, a matter of exceeding importance is the choice of a subject; and this, if possible, should have a catchy title, the quicker to arrest attention. Occasionally there are topics like the Columbian Exposition, the disaster at Johnstown, and those of a kindred nature, upon which popular attention is concentrated for a comparatively brief time, but these must be taken advantage of while the public enthusiasm maintains, and cannot be depended upon for more than a limited period. Those of more general interest, and which are applicable at any time, are the more desirable.

The subject having been selected, it is of much consequence that the matter be prepared with care, and that the most striking points be described in choice and appropriate language. Too much stress cannot be laid upon this essential feature, for the way in which this is done goes far towards inducing success or failure. A good plan is to write out the entire lecture from the best available sources, and then commit it to memory. If the lecturer have a fluency of speech which enables him to talk readily from notes, he is consequently fortunate; but comparatively few, even of so-called good speakers, possess this talent to any marked degree, but it is a good one to cultivate by any one who has the good fortune to be so gifted. The written lecture, however, possesses this advantage, that it enables the speaker and operator to work more in unison, and thereby acquire a smoothness and accuracy not otherwise so readily attained.

Another essential which cannot be too strongly emphasised is that none other than the best slides be employed. It is a matter of surprise that so many lecturers are satisfied with inferior productions, and many an otherwise interesting and effective lecture has been hampered by the miserable apologies for pictures used for the purpose of illustration. True, it is sometimes impossible to get just the view one wants, or as good as is desirable, but that can occur only in a very limited number of instances, and, with the present admirable facilities for making slides, very beautiful transparencies, which are attractive because of their intrinsic merit, can readily be procured. By all means get good slides.

Another important consideration is the lantern. A poor instrument is literally worse than none, for no satisfaction can be assured to either lecturer or audience if the apparatus be of an inferior grade. The cost of a good instrument is so little in advance of a poor one that there is no excuse for selecting the latter, and the applicant for popular favour will sooner acquire recognition if he have the proper utensils with which to do his work.

But, if it is necessary to have a good lantern, it is equally important to employ a first-class operator. Many an otherwise meritorious effort has been spoiled by the antics of a lantern manipulator who did not know enough to properly manage his light, to rightly adjust his lenses, or to even put his pictures in proper position. It is not so difficult a matter to operate a lantern that one cannot, by proper practice and attention, learn to do it well, and an audience should not be subjected to annoyance and injustice when the matter could so readily be obviated. See to it that you have an efficient operator.

The personality of the lecturer occupies a foremost place. There are certain requirements which he should unquestionably possess, and one of these is a properly trained voice. This effects not only its carrying quality but those other essentials of which the voice is so fully competent. It should be able not only to sustain itself for a long period, say, an hour or more, but should maintain its flexibility, so that tone and colour can be given to expression. There are speakers who start well enough, but soon show signs of weariness, which manifest themselves in disagreeable monotones and husky utterances that quickly tire their hearers.

The writer recalls two instances which serve as illustrations by way of contrast. In the first the speaker was hampered by an imperfect manner and an indifferent voice, although the subject-matter was most excellent. In the other, the lecturer who spoke for nearly an hour and a half, showed so little the effect of the exertion that he was congratulated upon his success by quite a number of his audience, who seemed to think the speaker possessed a remarkable gift. In explanation, the lecturer, whose physical proportions were by no means robust, stated that he had spent both time and money to acquire the skill he had evidenced, and that it was his teachers who were to be commended, whose methods had demonstrated their correctness and value. The voice is susceptible of such manifold variety that art can accomplish much under a skilful trainer even where nature has not been lavish with her gifts.

Dignity on the part of a public speaker is a desirable accompaniment. Ease of manner soon exerts an influence upon the audience and puts the listener in a more receptive mood. What is termed personal magnetism, that quality which places a speaker *en rapport* with his audience, goes far towards establishing a mutual sympathy that renders each attractive to the other. It is this power which gives the natural orator a decided prominence over his less gifted fellow. It is susceptible of development, however, and by proper cultivation can be enlarged and strengthened until it possesses some measure of force.

To the veteran in the lecture field these suggestions may possibly seem trite, but to the tyro they may be of service in helping him, in the outset of his career, to surmount difficulties which might otherwise be met only by annoying experiences.

R. J. H.

CHADWICK'S PORTABLE OXYGEN GENERATOR.

W. I. CHADWICK, 2, ST. MARY'S-STREET, MANCHESTER.

THIS oxygen generator consists of a safety valve retort, in which small charges of chlorate of potash and manganese are heated by a Bunsen's burner. The oxygen is conveyed by a ⅜ rubber tube from the top of the generator to the floating bell of a portable gas-holder, and from this direct to the lime light jet. As the oxygen is used, the bell of the gas-holder sinks in the water, which is used as a luting. The generator is then to be recharged, and thus a continuous supply of oxygen can be maintained.

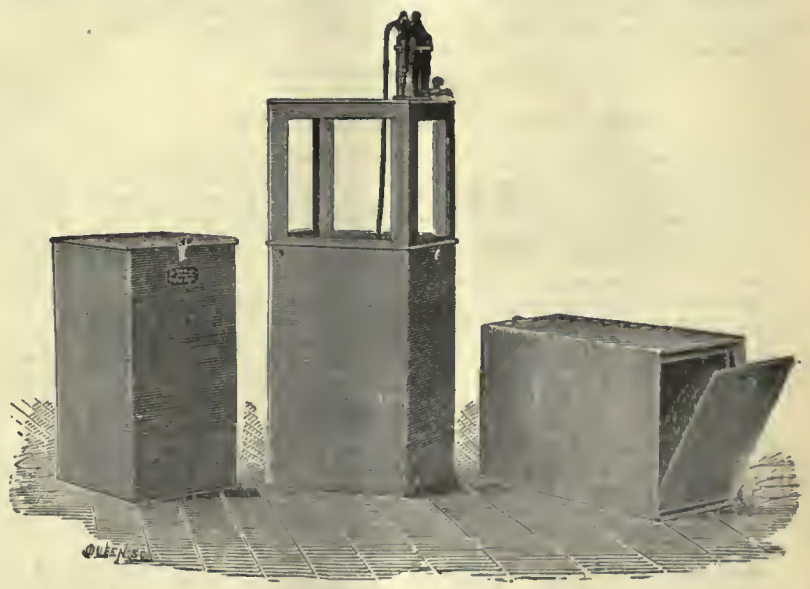


FIG. 1. FIG. 2. FIG. 3.

The general principles of the generator can be seen from fig. 4. It consists of a flat plate and a bell-shaped cap. These are turned and ground together, forming a gas-tight joint, and supported by a stand, in which is the Bunsen's burner. On the top of the cap is a bent tube, by which the oxygen is conveyed to the gas-holder, the fastening being effected by a bow, shown in the illustration, with a wooden handle on the top, and at the lower extremities are spiral springs, adjusted to maintain a pressure equal to 1½ lbs. per square inch, or, in other words, weighted to about 12 lbs. dead weight.

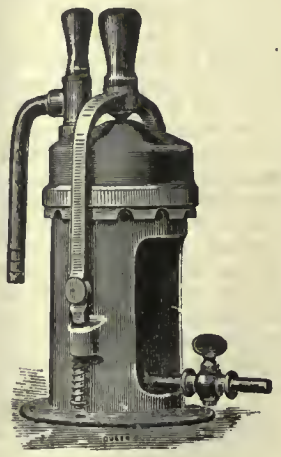


FIG. 4.

To charge the generator it is necessary to pull over the bow by the wooden handle, remove the cap by the other wooden handle, place a charge on the bottom of the generator, replace the cap, and push up the bow.

The gas-holder is made of metal, japanned inside and out. It is telescopic, for convenience and portability in travelling When closed, as in fig. 1, it measures 24 × 16 × 12 inches.

The following are the instructions for use:—To set up for work, draw out the upper part, as in fig. 2, and secure by three small brass bolts and wing nuts, place the generator on the top, as shown in the illustration, remove the screw cap on the top of the bell of gas-holder, and pour water from a bucket until the outside is full up to the top of the bell. The water is to make the luting, and for the bell to float when full of oxygen. By this time all the air has been expelled. Next replace the screw cap and connect the rubber tube from the generator to the bent metal tube of gas-holder, and by another rubber tube connect the tap on the top of the gas-holder direct with the lantern jet. Now fill the reservoir on top of the bell with water, to, say, 4 in. or 5 in. high (this is to apply the pressure). Charge the generator as described, light the burner, and in a very few minutes the oxygen will be generated, and in its passage through the water of the gas-holder it will be well washed and purified. The lantern may now be lighted, and, as the gas is used, the generator can be recharged as described, thus a continuous supply can be maintained.

The charges are made as follows:—To four parts of chlorate of potash and one part of manganese add sufficient water to moisten—not to make too wet. This should be mixed in something like a clean earthenware dish or basin, then fill the mould supplied with the generator, using a little pressure. Smooth off the surplus with an old table knife or spatula—do not use a piece of stick or wood for mixing or smoothing off. On turning the mould over, the cakes will leave entire. They must then be set to dry either spontaneously or by gentle heat, and when dry the bottoms of the charges are to be coated by dipping into a mixture of manganese and water, made to the consistency of cream, and after final drying they may be used at once, or stored away for use at any future time. The coating of plain manganese at the bottom of the charges is simply to prevent the spent charges sticking to the bottom of the generator.

EXPLOSION OF AN ETHER SATURATOR.

MR. W. HOWARD STABLES writes to the *Derby Express:* "The worst of having a slight mishap with a lantern is that the general public, being somewhat in the dark as to the apparatus used, is likely to feel an alarm which in many cases is quite unnecessary, and to imagine that, if the worst did not happen, it was due rather to chance than to the fact that with the apparatus in use at the moment no serious accident was possible. I was using on Wednesday last a cylinder of oxygen, an ether saturator, and a mixed gas jet, when early in the exhibition the light failed, and nearly went out, and, as I was endeavouring to adjust the taps of the jet so as to give a better light, one cylinder of the ether saturator blew up. As this apparatus is made of thin brass, such an explosion could hardly be attended with serious danger, as the thing simply was ripped open, and no portions of it were scattered. The worst that could have happened would have been that the operator and possibly one or two near him might have been burnt, perhaps severely. The Ilkeston disaster, to which the public naturally turn their mind on a seeming recurrence of this kind of accident, was occasioned by a totally different cause—one which, after that experience, no sane person would run the risk of incurring, There the supply of gases was contained in the old-fashioned leather bag—oxygen in one, hydrogen in the other. But, unfortunately, the half-filled oxygen bag had been filled up with hydrogen by mistake, and the result was a most deadly explosive mixture. That mistake can never occur with cylinders, as the oxygen cylinder is screwed on to the supply tap by a screw which turns the opposite way to the hydrogen screw. Thus the wrong cylinder simply will not go on the wrong supply tap. Your readers will see, therefore, that no such risk was run on Wednesday last, and to parallel my mishap with the Ilkeston disaster is to needlessly alarm the public. At the same time, I must confess that I am still in the dark as to the cause of my accident, and that such of my friends as understand the working of the lantern and have offered me explanations of the accident have indicated causes that might recur almost every time the saturator is used. I am in correspondence with the makers, and hope to get at the bottom of the matter in a day or so. I cannot close my letter without referring to the splendid behaviour of the company at the accident. A few women, who were too far off to see what had happened, were alarmed and screamed; but as, thanks to the electric light, which was promptly turned on, it was at once clear that no cause for alarm existed, and that no one was hurt—the company sang the National Anthem and quietly dispersed. Let me, in conclusion, offer the following advice to that section of the public who frequent lantern exhibitions:—

"1. If you see the ominous bellows-like form of the old-fashioned gas bags—*Flee ! !* It is never safe to use them; they are dangerous to all in the room.

"2. The ether saturator is risky to the operator and those near him

"3. Two cylinders, or one cylinder and common gas, is safe. Any accident from cylinders will occur before the lecture begins. The safest time is when the exhibition is going on and the gas is being released."

Apropos the foregoing Mr. E. C. Green writes us: "I was present at the exhibition and the behaviour of the crowd was beyond all praise, as the explosion was certainly very alarming.

"At the moment of explosion the operator was altering the pressure at the outlet of the oxygen cylinder. No regulator was used. The saturator had been charged with ether before the performance, sp. gr. ·720."

A DISCOMFITED SHOWMAN.—An applicant for popular favour secured one of the largest and best known halls in Philadelphia for a lantern exhibition, says *The Exhibitor*, and issued free tickets to those whom he thought might be impressed by his venture, hoping thereby to secure engagements. The views embraced a variety of scenes taken from the Old and New Testaments. When the entertainment was about to begin the exhibitor discovered that his pianist was not there, so another was secured from among the audience, suggested by some one to whom the lecturer had mentioned his dilemma. Hastily giving directions to the player to adapt himself, as far as possible to the illustration, the show began, and went on to the apparent satisfaction of the audience, until a very striking picture of the wise men journeying to Jerusalem was shown. The performer had, in the meanwhile, nearly exhausted his stock of pieces, some of which were a little incongruous; but the climax was reached when, as an accompaniment to the picture mentioned, he suddenly and vehemently pounded out *When Johnnie comes marching home*. The effect was pronounced. The audience began keeping time with their feet, but, in a moment more, broke out into loud laughter which swelled into a perfect howl. The demoralisation was so great that the manager's prospects were utterly ruined, and but one other of his exhibitions was given in the city, and the engagement for this was made in advance of the free entertainment.

A PHOTOMETRIC STANDARD WITH ACETYLENE.—Acetylene, in the author's model, issues from a small conical orifice carrying with it the necessary quantity of air. It then penetrates, by a narrow aperture, into a tube where the mixture is effected, and which terminates with a bat's-wing burner made of steatite. The entire flame corresponds to more than 100 candles under the pressure of 0·30 metre of water. The consumption of ethylene is 58 litres per hour. We see that the illuminating power of acetylene is more than twenty times that of coal-gas burning in a Bengel burner (giving 1 carcel = 9·6 candles for 105 litres), and at least 6 times that of the same coal gas for an Auer burner (giving 1 carcel for 30 litres).—J. VIOLLE in *Comptes Rendus*.

THE lantern-slide catalogue of Mr. A. H. Saunders, of Heath-street, Birmingham, for the current season, is to hand. Many popular sets are particularised.

WE have received the lantern-slide catalogue of Mr. T. T. Wing, Chatteris, Cambridgeshire. Mr. Wing makes a speciality of colouring lantern slides, and also supplies lanterns and their accessories.

A PHOTOGRAPHIC "NEW WOMAN."—Mrs. Mary Winslow is travelling through Western New York with a portable photograph gallery taking pictures, and doing it well. She is modest and unassuming, but carries a couple of revolvers for the "Rubes" who get too fresh. She makes no claims to "newness," tends strictly to business, and has more than she can do.—*American Journal of Photography.*

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*March* 6, 1896.

THE LANTERN RECORD.

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LANTERN MEMS.

The projection of animated panoramas and lifelike motions of everyday life is now an accomplished fact, and, although several earnest workers have been experimenting for some time past in this direction, the honour at the time of writing of being the first to make in England a demonstration that approaches closely to perfection must be awarded to MM. Auguste and Louis Lumière, who have been, through their agent, exhibiting during the week in the Marlborough Room, Polytechnic, their apparatus, which is called Lumière's Cinematograph.

* * * * *

I say at present advisedly, for I learnt, only recently, that Mr. Birt Acres was to give a public exhibition of the results of his apparatus and methods of working in this direction on Monday, March 2, and, if the report I have received privately is confirmed, the results should be very good, in fact run the French instrument very close. Both, however, are thought to give better results than the apparatus exhibited at the Royal Institution on Friday; but then, on the other hand, the limited space and nearness of the audience, no doubt, made the vibration and noise of the Theatrograph more apparent.

* * * * *

To return to the Cinematograph, which, I am informed, will not be for sale for twelve months, and then will cost 60*l.* to 80*l.* complete, but will be worked under concessions in the various capitals of Europe with a view to money-making by charge for admission while it is a novelty. That there is money in the invention seems to be apparent from the fact that one financier offered one million francs for it. It certainly, in my opinion, wants a lot of resolution, backed up with confidence, to refuse 40,000*l.*; but, as during a few weeks in Paris, where the apparatus has been on show every half-hour during the latter part of the day to crowded houses, many thousand pounds' profit have already been made, the sanguineness of MM. Lumière may turn out to be justified.

* * * * *

The audience at Marlborough Hall or Room only see the results of the projection, for the apparatus is placed in a gallery and carefully concealed by curtains. I am, however, indebted to Mons. Trewey, who is the *concessionaire* for England, for certain particulars respecting the apparatus. Optically, it is an ordinary magic lantern supplied with an electric light, the regulator for same having 12 mm. carbons, and using 15 ampères of current. Each subject or picture, of which at present there are ten shown at each *séance*, consisting of 900 to 1000 exposures, and the film on which they are produced is fifteen yards long. The latter is propelled through the lantern front by hand motion, it having been found that more care could be taken of the films in that way than if electricity were employed.

* * * * *

And now for the subjects. Imagine yourself sitting in a nice-sized hall, and a small screen five or six feet square, or rather oblong, with a dark border, hanging in front of you, well above your head and level with the gallery, when presently, after a little introduction, a picture appears on the screen, at the same time as the electric lights are turned out in the hall. What is it? Well, we will take a typical one; and, as it is photographic in more senses than one, it shall have precedence. It is a steamboat pier, and there is a gangway in the mid distance. A little whirr is heard in the gallery above our heads, and the picture on the screen is all animation. Some one is walking up the gangway carrying a camera, and he is followed in quick succession by a hundred or so of others. Some turn to the left at the end of the gangway, and others to the right; every third or fourth person raises his hat, as if he recognised some one the audience cannot see; but, when two or three run across the intervening space, one concludes they wish to be quickly out of the field of view of the camera, and that the salutations are for M. Lumière, who is photographing this wonderful scene. It was stated that the gentlemen coming from the boat were those attending the Photographic Convention at Lyons (I think). Certainly the marvellous detail, even to the puffs of smoke from the cigarette, spoke volumes for the perfection of the apparatus employed.

* * * * *

The subjects are considerably varied, the first being a domestic scene, *The Family Tea Table*, in fact with father and mother and the little baby seated at the table; the child is in turn fed, and the lady sips her tea or coffee, and every movement is gone through with all the exactness of life. *The Railway Station* again forms another scene. The station is at first apparently empty when the train is seen approaching, and gradually gets nearer and larger until the engine passes where we are apparently standing, and the train stops, the guard comes along the platform, passengers get out and in, and all is *real*. *The Forge* again gives an opportunity of showing that the apparatus can faithfully reproduce delicate objects, for, when the hot iron is plunged into the barrel of water, the steam rises in a most natural manner.

* * * * *

The scene outside a café of three gentlemen playing cards, and the waiter bringing in refreshments, drawing the corks pouring out the contents of the bottle, and each of the three toasting the other during an interval in the game, was rather "mouth-watering," and the hilarity of the garçon at the results of the game seemed almost bound to produce laughter among the audience. The photographic

reproduction of Monsieur Trewey's wonderful girations of a strip of long calico whipped round and round must be seen to be realised, for it baffles description.

* * * * *

THE same may be said of the *Street in Paris*, and, finally, the *pièce de resistance*, viz., *Sea Bathing in the Mediterranean*, for here we have the breaking waves on a shingly shore, a diving or jumping board, and the bathers in succession going down this board, jumping into the sea, battling with the breakers, climbing the rocks, and getting once more on the diving board, all so faithfully to life that one "longed to be there."

* * * * *

WHAT Edison has done with the kinetoscope for visual observation, MM. Lumière have done for projection, and if, as I was informed when I first saw the kinetoscope on its introduction to London, that they had already completed an apparatus of the same kind for projection, it is a great pity for Mr. Edison and the Kinetoscope Company's sake they delayed the introduction so long. The idea was to keep it in reserve until the novelty of the ordinary kinetoscope had worn off, but the moral to be drawn from the facts is, "Don't delay;" for over and over again it must have been realised by workers, that others, finding a want to be supplied, had introduced the *very thing* that they themselves had done, and been obliged, from force of circumstances or want of time, to put aside for a more favourable opportunity to make it known.

* * * * *

TALKING of kinetoscopes, I recently saw a circular giving particulars of a resolution, on the part of the Company running them, to supply a more popular-priced instrument, in fact, instead of a machine costing 65*l.*, they had, by making up larger numbers of each part of the instrument, been able to produce them so that they could be sold for about one-fourth of that sum. The next thing is to design, manufacture, and introduce an apparatus to produce the subject for both the kinetoscope and the Lumière Cinematograph cheaply.

* * * * *

MY advice to all lanternists is this, Take the first opportunity of going to the Marlborough Hall, to see the "living photographs" I have described, and country readers up for the day should time themselves to be in Regent-street (Oxford-street end) five or ten minutes before any of the hours between two and ten p.m. As this may sound something like an advertisement, I may add I have no interest whatever in this invention, but simply a desire to inform the lantern world of a novelty they ought not to miss, and to set manufacturers thinking, so that they can produce apparatus to give as good, if not better, results; for the lantern industry, without doubt, wants "waking up."

* * * * *

THE last news I had of the Home Office report on the gas-cylinder question was that it had been passed for the press, and would probably be a fortnight before it was ready for issue; it is therefore necessary to exercise a little more of the patience we have been reserving during the dull lantern season. I was very pleased to see the Editor exposing the foolishness of the lay press in speaking of the chemical experiments and explosion of a vessel as a gas-cylinder explosion in Holborn. It had not any more to do with oxygen gas than if one took a saucepan, filled it with water, then hermetically sealed the lid down, and put it on the fire and left it there until the steam could not be confined any longer, and so burst the pot to escape.

G. R. BAKER.

THE SEARCH LIGHT.

MY knowledge of Japan has been chiefly derived from books—and Gilbert and Sullivan's charming opera, *The Mikado*, but, unlike most of my fellow-countrymen similarly placed, I have had the further advantage of hearing from the lips of that eminent traveller, Mr. Drage, the Honorary Secretary of the Photographic Convention of the United Kingdom, a great deal on the subject of the England of the East, in which delightful country he not long since toured—and took photographs. So, primed with an extensive stock of first-hand Japanese information obtained from a reliable and graphic *raconteur*, which we all know friend Drage to be, my readers will easily understand with what lightness of heart and confidence of success it was that I undertook, in the cause of philanthropy, to deliver, a few months ago, a lantern lecture on Japan and the Japanese.

* * * * *

MY experiences on that eventful occasion were mixed, that is, entertaining and instructive in about equal proportions. The preliminaries of this particular lecture were mapped out with mathematical exactitude. My friend (a man of some eminence in the lantern world) undertook to officiate at the jet. Two-hundred-and-fifty slides, and sufficient reading matter about Japan and the Japanese to fill a large book were handed to me to arrange in proper order, and it was agreed between my friend and myself that I should call upon him early in the evening of the eventful night, dine with him and a gentleman under whose auspices the lecture was to be delivered by the eminent authority on Japanesia whose name (in large letters) footed, I was told, a bill that was to be circulated by thousands.

* * * * *

FOR two or three days before the lecture I was absent from town, and on my arrival home I found awaiting me a letter from my friend, asking me to meet him about two hours earlier than the time previously agreed upon. All my efforts to comply with his request only resulted in my reaching his establishment exactly at the hour originally fixed. I was met by the reproachful statement that Mr. X could not wait any longer, and that he had gone off to deliver the lecture without me. "But *there*," I excitedly rejoined, pointing to a box of slides and a parcel of MS. notes which I deposited before my puzzled informant—"there *is* the lecture! He can't give it without me; he has never addressed a public audience in his life; he's got to work the lantern; he hasn't any slides with him; h—— but stop, *where's* the lecture to be given?" In the hurry of making the appointment, I had forgotten to take the address of the lecture hall, and all I knew of its whereabouts was that it was somewhere—*somewhere*—on the south side of the Thames!

* * * * *

"WHERE, sir!" came the marrow-freezing reply. "*I* don't know, I'm sure; but perhaps they know at the other office. I'll telephone and ask." "Bless you for that happy inspiration," I murmured. Of *course* they'll know. Why need I have allowed myself to break out into that cold perspiration of fear? Why conjure up mocking visions of three or four-hundred expectant hungerers after Japanese knowledge frigidly receiving the statements that the individual who was billed (in large letters) to address them had not put in an appearance, that the slides and lecture were with him, and that their money would in all probability be returned to them? Why torture myself with contemplating the withering disgust of the wealthy Chairman, at whose dinner table I was to have sat; and, above all, the rage and mortification of my friend the lanternist, who, if he hunted up any slides of Japan, would be powerless to describe them, and, if he failed to find any, would be reduced to the terrible humiliation of throwing himself on the tender mercies of a disappointed audience? Why, I reflected, as I wiped my clammy brow, why bother about all this when they're sure to know at the other office where the lecture is to take place? There is plenty of time. I can follow at once, and—all will be well.

* * * * *

THEN the telephone bell stopped ringing, and—— They *didn't* know where the lecture was to be! Mr. X. had left in great excitement a quarter of an hour before. He had sent four telegrams after me. They were very sorry, they knew nothing about it. . . . Then a cold silence filled the room in which I stood; my companion looked at me with undisguised pity, and I gave myself up to mute, helpless despair. So I stood for several minutes, numbed and deaf, with the scene before me shrouded in a semi-opaque film. And then—the door was suddenly burst open, and, hatless, breathless, panting, and gasping, my friend, a fat man, rushed in from his other office, and sank into a chair, jerking out with difficulty the heartfelt ejacula-

tions, "Thank God I came back! thank God I've found you!" and then, when his excitement had partly subsided, and my own usual smile had returned, "You villain! you did this on purpose!"

* * * * *

In ten minutes we were in the train, bound for our destination. In vain I explained to my friend that our original appointment was for six o'clock, that I returned to town at five o'clock to find that in my absence he had altered it to four, and that *I* was not the man who would be likely to forget the hour at which I was expected at a millionaire's table. No; he would not be comforted. In the intervals of mopping his face and getting back his breath, he accused me of plotting his discomfiture, vowed he would never again "be had," said I ought to be ashamed of myself for sacrificing a magnificent dinner for a practical joke, doubted if we should get to the hall before the people got in, knew very well that the lantern and screen would have to be rigged up in full sight of the audience (a thing he abominated), and was *sure* that, now he had found *me*, the other villain (Smith, his man) would take the lantern and screen to the wrong place, after all! Misfortunes never came singly. Something *told* him things would go wrong. I ought to be ashamed of myself to treat an old friend like that. . . . Gentle reader, pity me, who, having to stand about twenty minutes of this sort of thing, was also conscious of a certain emptiness of stomach, which reminded me that the appetite I had specially prepared for a *recherché* dinner was thrown away.

* * * * *

Well, we reached the hall at last—that is at half-past seven, the time at which the doors were announced to open; Mr. Smith, of course, had preceded us. A surging mob of youths and children had to be kept outside the hall until Mr. X and Mr. Smith had erected the lantern, made the connexions, and placed the screen in position. The duty of quieting the young people was assigned to me. It was easily accomplished by the aid of all the good humour I could summon to my assistance. At a quarter to eight a map of Japan appeared on the screen, the doors were opened, the room quickly filled, and two hours afterwards my friend and I received "the usual vote of thanks" for our services, and everybody went home happy.

* * * * *

Everybody, that is, but my ungrateful friend, who topped the maledictions he had already heaped upon me by saying that he hoped I'd give him the chance to do as much for me as I had done for him that night. He has since explained that he bears me no malice, and that he didn't mean me to accept his aspiration in the dubious aspect it undoubtedly appeared to have at the time. Still, I don't think I'll give him the chance he asked for. Radiant.

EXPERIMENTAL WORK WITH A LANTERN.

In continuation of the notes in the January number of The Lantern Record, p. 3, we will proceed to the explanation of some of the more simple phenomena of colour.

The first experiment should he to prove that, although we have decomposed our white light, we have not altered it materially, and that every constituent ray existed there prior to passing through the prism, we have neither subtracted from nor added to it, but merely placed in regular order the conglomeration of rays of different colours, and we have merely to concentrate our coloured band into a narrow line again to obtain white light. For this purpose we require a lens which need not be achromatic. Single lenses of comparatively large diameter may be obtained at reasonable prices from most opticians, but the front lens of a good large portrait lens may be utilised, or, failing this, one of the water bottles used by watchmakers as condensers may be used. When the front lens of a portrait combination, or a single lens is used, it should be temporarily mounted on a card, which should project at least three inches on each side; this prevents any light not taken up by the lens from reaching the screen. To support the lens, an ordinary oak picture frame can be obtained and screwed down to a stout piece of two-inch deal, which should he weighted. Now make a small cage of perforated zinc, and to do this procure a piece about one and a quarter inches wide, and of sufficient length to nearly go round the lens; bend the edges up slightly on each side, and curve lengthways into a circle. In each end weave a piece of thin brass wire in and out of the holes, place the lens in the cage, and tie the wire together; now with stout copper wire fasten this cage to the four corners of the picture frame and pull taut.

If the lens thus mounted is placed in the path of the rays after passing through the prism, it will be found that a white image of the slit will again be formed on the screen, and the insertion of a white card between lens and prism will show a small spectrum, and on removing the card the lens will reform the spectrum into white light. Of course, a second prism may be used instead of the lens to recombine the spectrum, but my idea is rather to point out how experiments may be shown with very little outlay. Of course, if a second prism be used, its base must be placed next to the apex of the first.

The best definition of colour is that it is a suppression of light, and to prove this we will assume that we have recombined the spectrum on the screen. Now pass, close to the recombining lens, a piece of card along the spectrum, and it will be found that the image on the screen is no longer white but coloured, this being due to the suppression of one or more of the coloured rays.

To prove that colour is due solely to the suppression of some of the coloured rays, we can use two bits of glass, or some sheets of glass coated with collodion stained with aniline dyes.

I would point out here that the very best position of the lantern for such work as we are considering is in front of the audience, and not with the lantern away at the back of the hall. A very long spectrum is not essential, but one about two feet long shown on a good opaque screen, and the lantern and screen so arranged that the lecturer can readily have access to both is an enormous convenience. If the lantern is at the opposite end of the hall, a good lantern operator accustomed to your experiments is absolutely necessary, whereas, when both are within your reach, you can easily walk from lantern to screen, perform your own experiments, and thus ensure everything going without a hitch.

Procure from a dealer a piece of double flashed ruby glass, such as is used for dark-room windows, and show this first on the screen by merely removing the prism; now replace the prism and show that, although the glass is red, it is not so because it turns all the light that passes through it into red, but because this glass will cut off the whole of the violet, blue, green, and yellow down to about C in the deep orange. Paler shades of red, or even double flashed orange, may be used, and the paler the colour, the more spectrum colours will be seen, although the resultant visual colour is red. Some of the deepest chromium green glass may be used in the same way, and with two thicknesses of this and one of the double flashed ruby it is possible to suppress all the colours, and therefore obtain no light, but black.

Two narrow strips of the green and red glass should be cut off with a diamond or glass-cutter, and then bound together one above the other, and this, placed in front of the slit, will enable one to explain why, when superimposed, we get no light, because the green glass cuts off the whole of the red, and the red cuts off everything but the red, so that, when combined, there is no chance of any light getting through.

We can also show a very pretty experiment which I have seen Lord Rayleigh perform more than once, and that is, to show that red and green make a deep yellow. Procure some litmus tincture, and dilute with water, and then add a twenty-grain solution of gelatine and coat glass with it; it is advisable to coat a stock of these glasses. This, placed before the slit of the lantern, will project a spectrum from which the yellow and orange is entirely wanting if the litmus is strong enough. A strong solution of aurine treated in the same way cuts out all the blue and violet, and both together only allow the red and green to pass, and, by superimposing them, we get on the screen, not using the prism, of course, a deep yellow. Mr. Lewis Wright suggests the use of a solution of litmus and a solution of potassium of bichromate, and he states that finer results are thus obtained.

Innumerable and striking effects can be obtained by using,

suggested above, glasses coated with collodion stained with aniline dyes; but, in preparing these, care must be taken that the solution is not so saturated as to crystallise out on the glass in drying.

With many coloured substances we obtain not one or more particular colours visible in the spectrum, but peculiar and characteristic absorption bands, the resulting visual colour of the solution, or whatever it may be, being the sum of what is left. One of the most striking of these experiments is that of iodine vapour. To show this, a long test tube of about half an inch internal diameter should be obtained, and at the bottom be placed a few crystals of iodine, the mouth closed with a cork in which is a very small hole. On placing this in front of the slit, so that nothing but the empty test tube is there, the spectrum will be normal, but, with a small spirit lamp, heat the bottom of the tube where the iodine lies; as the heat increases the iodine rises in vapour, and gradually the absorption bands make their appearance, and on cooling the tube they gradually die out. Chlorophyll is another substance which shows well-marked bands; and, to procure this, either spinach or parsley, about two ounces of each, should be cut up fine and macerated for a week, with about four ounces of spirit and sixteen ounces of water, and then filtered off; a little zinc dust should be added to preserve it. The absorption bands shift their places considerably, or appear to, according to the thickness of solution, and, to show this, a solution may be diluted whilst before the slit by squirting water into it. By merely adding an acid or alkali too the spectrum may be changed, and this is notably the case with litmus and chlorophyll. Saffron too is another substance which gives totally different spectra, according to whether it is macerated in amylic alcohol, pure alcohol, or proof spirit. Most of the uranium salts too possess very characteristic absorption spectra, as does also blood, and the absorption bands of this may be made to change by adding acids.

A very excellent way of showing the effect of increasing the thickness of a solution on its colour and spectrum is to use prismatic or wedge-shaped cells; these can be made very easily of wood if the glass sides are fastened in with the asphalt preparation suggested last month. By filling such cells with liquids the increase of thickness may be shown by passing the wedge from the narrow end up to the thick end in front of the slit.

Before leaving this part of the subject it may be of interest to give directions for producing particular bands of the spectrum, the so-called monochromatic, which, as will be seen, is by no means monochromatic. For this purpose we require cells or troughs of definite thickness, of four-fifths of an inch internal measure, and we want three of these and two troughs with three-fifths internal measurement.

For red light from wave-length 718 to 639, or from about A½ B to C¼ D, we must use a cell of four-fifths of an inch filled with a solution of crystal violet 5BO, made by dissolving one and a half grains in four and a quarter ounces of water, in combination with a trough of the same thickness filled with a ten per cent. solution of neutral potassium chromate.

For yellow light from wave-length 614 to 574, or from C¼ D to D¼ E, we want three cells, one of four-fifths of an inch filled with a solution of 164 grains of nickel sulphate in one ounce of distilled water, a second cell of three-fifths of an inch thickness filled with ten per cent. solution of potassium chromate, and a third with a very weak solution of permanganate of potash, one quarter of a grain in two ounces of water.

For green light from wave-length 540 to 505, or from about E to just beyond *b*, we must use 328 grains of cupric chloride dissolved in an ounce of water in a thickness of four-fifths of an inch, and a like thickness of ten per cent. solution of potassium chromate.

For bright blue from wave length 526 to 458, or from E to F¼ G, we must use a 0·02 per cent. solution of double green SF in a thickness of four-fifths of an inch, and a second cell of the same thickness of a fifteen per cent. solution of copper sulphate.

For dark blue from wave-length 478 to 410, or from F¼ G to *h*, we require a solution of crystal violet just one-tenth the strength of that used for the red in a thickness of four-fifths of an inch, and a fifteen per cent. solution of copper sulphate in the same thickness.

I must apologise for introducing these somewhat troublesome details, which, by the bye, were first suggested by Landolt, but they may be useful also to the photo-micrographer, as with these he can possibly obtain better resolution of fine detail markings in diatoms, &c., and, by using the red, the green, and the deep blue, we have practically the three fundamental colour sensations, and with a triple lantern we may make the so-called white light.

We have been dealing entirely so far with transparent colours, but, before leaving the spectrum, we can easily show the action of coloured, opaque substances on the spectrum, and for this purpose it is advisable to obtain from a paper-maker some sheets of body coloured papers. These can be had in all varieties of colours, and with a matt surface; the shiny surfaced papers should be rejected. Strips of such papers, pasted singly on to an ordinary mount, may be passed along the spectrum, and it can be pointed out that the papers absorb or suppress certain colours, the sum of the remainder giving rise to certain sensations which we call red, yellow, green, &c. Of course, the spectrum may be allowed to fall for its whole length on the papers if they are pasted in long strips one above the other, and the action is well seen then.

If we use the monochromatic lights suggested above, it is very easy to show by means of these papers that, for instance, a brilliant orange looks black when illuminated by blue.

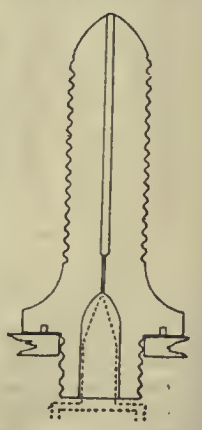
A rather striking experiment, proving most conclusively that red will not reflect green, or yellow blue, may be performed by taking a white card and writing a word or making a sketch in some such colour as cochineal solution, not very deep. This will be distinctly visible by white light, but with a deep ruby glass it no longer appears; but, change the red glass for a chromium green, and the letters or sketch instantly start up as black as possible. This may also be shown with gamboge and violet glass, or permanganate of potash, or the solution recommended above of crystal violet. For those who do not care to take the trouble to do this, the box lids of Lumière's plates may be used in this way. With a little care and experimenting in this direction, it is possible to entirely reverse a word or sketch, making it appear first red on a black ground, and then black on a green ground, or to obtain innumerable effects. Some very striking results may be obtained in this way by using the special red, yellow, and blue inks which have been placed on the market for three-colour printing, and for this hint I am indebted to a friend whose name is fairly well known in connexion with this work.

PHAROS.

PHOTOGRAPHIC WORKERS AT WORK.

II.—How Mr. R. R. Beard Makes a Regulator.

A gas-regulator is, to most people, more or less of a mystery. It is a neat-looking little brass instrument, which is screwed on to the cylinder, and, no matter what the pressure of the gas in the cylinder itself may be, it issues from the regulator in a steady stream, and at a pressure of but a few inches of water, while examination of the instrument itself only conveys the information that bellows, in some way or another, are employed. Unless these bellows are removed—and not many would care so far to tamper with the regulator—nothing further can be ascertained except from a drawing.



Much more than this we learnt on calling on the maker at 10, Trafalgar-road, Bermondsey, one day last month, and the information then gained we will proceed to convey to our readers to the best of our ability.

The first part of the regulator to be considered is the nipple. This is the stem of the instrument, which screws into the cylinder, and, as it is the only portion, except the extreme tip of the valve piece which has to bear the high pressure of the compressed gas, it is a very substantial gun-metal casting. As soon as it has been turned, screwed, and drilled to the shape shown in our sketch, it has to be tested to see that the metal is not to any extent porous. This seems almost unnecessary at first sight, but it must be remembered that, in casting, all metals are liable to the presence of minute pores, often visible to the naked eye, due in large measure to the fact that cooling takes place from the outside inwards, and that the outside of a casting is solid while the interior is

still in a molten condition. To test it, then, the nipple is screwed into a cylinder, the opening at the top is plugged up, and the gas turned on. Soap and water being brushed over the nipple, any leakage manifests itself at once by a bubble being formed; if this is not the case, and the casting is seen to be sound, it is ready to have the valve fitted to it.

The selection of suitable metal for the little valve piece was an important matter, Mr. Beard informed us. Steel was out of the question, because of the readiness with which it oxidises, while the material must be different from that of the nipple into which it is bedded, or adhesion would take place. Finally, a material something whiter than gun metal in appearance was selected; one so hard that special tools are necessary to work it, and care has to be taken in doing so, on account of the brittleness which invariably accompanies great hardness. This quality has an additional advantage in the fact that the seating of the valve being of so much softer a nature, the pressure of the valve on it makes its shape wear exactly like that of the end of the valve itself. This valve piece is to be seen at C in the accompanying sketch, along with two eccentrics which work in it, and which are attached to a system of levers known as lazy tongs.

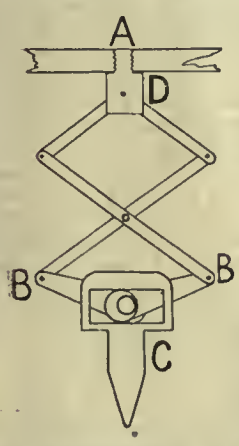
Before referring to the levers which work the valve, it will be noticed that part of a collar is shown on the upper part of the nipple. This is the base of the regulator, and is fitted on to the nipple as shown by means of two dowels, the fulcrum piece, to be referred to afterwards, being screwed down on to it and holding it in its place. The base extends outwards from the nipple considerably, carrying a projecting ring on its upper surface, grooved to receive the lower end of the rubber bellows, and having its outer edge screwed to take the brass cap which covers and protects the mechanism and bellows. It is into this base, moreover, that the delivery pipe is screwed.

The relative positions of the parts shown in the two sketches can be seen by reference to the first, the dotted lines showing the lower portion of the valve where it enters the nipple, the extreme tip of the cone entering the narrow boring in the nipple forms the actual valve which stops the outflow of gas.

Handing us the two eccentrics and the valve piece, Mr. Beard suggests with a smile that we should put them together. Like many other puzzles, it is very simple when you know how, but it takes some little time before the exact way in which it is done can be seen. Unfortunately it is impossible to explain the method on paper within reasonable limits.

The lazy tongs, which are attached at their bottom ends to the two eccentric arms, carry at their top a little piece of metal, D, which screws into a disc forming the upper end of the bellows. When, therefore, the bellows rise, as they do when gas passes into them from the cylinder and cannot get out of them again, they carry up with them the top of the lazy tongs, and in so doing the eccentric arms are raised and the valve pushed down and closed.

A glance at the sketch will make this clear. It will be seen that, if A is raised, everything being free to move except the pin (seen in section as a black dot, on which the eccentrics turn, the arms, BB, must be raised also. The effect of raising BB is in its turn to thrust downwards C by means of the pressure exerted on it by the eccentrics. The introduction of the lever results in the upward motion of A being transformed into a downward motion of C, the extent to which C moves being much less than is the case with A, but the force being correspondingly greater.



The greatest leverage is exerted by the lazy tongs when in the position shown, and not when at their greatest or their least extension; therefore the position of the eccentrics is adjusted in such a manner as to make their greatest work done when the levers are in the best position for actuating them. The eccentrics are two in number in each regulator. Mr. Beard informed us that he had found it possible to make a regulator with only one, but that this was not advisable. As it is, they have to be made with the greatest accuracy to ensure each one doing an equal amount of work; since, if this were not the case, the valve, instead of being driven fairly and squarely downwards, would be inclined on one side, and tend to wear itself oval, while the top of the bellows, being thrown on one side also, would rub against the brass cap containing them.

On the top piece, A, a circular metal disc is screwed, a portion of which is shown in the sketch, the joint between the disc and the shoulder and screw of A being first luted with white lead. This cap has a groove on its outer edge, to which the bellows are fastened.

A gun-metal casting has also to be turned and screwed to carry the eccentric pin. This piece is known as the fulcrum. It calls for no special comment in itself, but it screws on to the projection shown on the upper part of the nipple, which is inside the base of the regulator, and the extent to which it is screwed up forms the most important part of the adjustment of a regulator. As the pin on this fulcrum piece is what decides the relative position of the valve seating and the top of the levers, it is obvious that, were that pin too near the seating of the valve, no amount of movement on the part of the eccentrics could open the valve far enough to let the gas escape sufficiently, while, were the distance too great, the valve could not close. The adjustment, therefore, has to be made, and this is done by interposing stout paper washers between the fulcrum piece and the base of the regulator on which it rests until the correct position is reached.

When this has been done the bellows have attention. These, in the different forms of regulator, are of three kinds. The first have parallel sides, and are those used in the standard pattern. The second are similar, except in being smaller and stouter for very high pressures up to thirty pounds per square inch. The third kind are like the first in substance, but taper to a smaller diameter at the top, and are used in regulators which are made to deliver the gas at pressures of from twelve to fifteen pounds per square inch, such pressure, in fact, as is required by the new injector jets. This taper form, by reducing the area of the top of the bellows, in itself increases the pressure of delivery without requiring the strength of the spring to be altered. Each kind of bellows is made of the best Para rubber, and is pulled over the projection on the base provided for the purpose, and tied on to it with stout carpet thread, no cement of any kind being used. By merely tying on the bellows, should the valve through injury at any time leak while the outlet was closed, the stretching of the rubber itself allows the gas to escape without bursting the bellows, which it would otherwise do.

At this stage the circular metal piece, having a groove on its outer edge, to receive the top of the bellows, is screwed on to A, which has previously received a luting of white lead, as already mentioned, the levers being held firmly the while. The bellows are then brought over the groove and tied at the top in the same way as at the bottom.

Nothing remains now but to screw in the outlet pipe and to put the cap on the regulator, between the top of which and the bellows is placed the spring. The caps are made from brass tube, screwed at the bottom, the tops of the caps being stamped and, after fitting in, soldered.

Each regulator has, of course, to be tested before leaving the works, and to do this it is screwed on to a full cylinder of gas and connected up to a jet, the tap of which is turned off. A branch pipe connects the tube joining regulator and jet with a very sensitive pressure gauge. The gauge indicates that the regulator, if properly adjusted, maintains a pressure in the closed tube of three pounds to the square inch or thereabouts, which drops to two and a half pounds when the jet cock is opened, thus indicating that a pressure of half a pound is required to close the valve against a full bottle of gas.

Regulators with rubber bellows can be constructed on Mr. Beard's pattern to deliver gas at any pressure up to about thirty pounds to the square inch. They deliver it very regularly from the cylinders now in use, in which high pressures are maintained, more or less, almost up to the point at which the cylinder is empty; but, for purposes of other than lanternists, regulators are wanted which reduce from much lower pressures than those used by the gas-compressing companies, and when this is the case Mr. Beard informs us that he found, in his early experiments, that the delivery from a single regulator is not so steady. For such purposes a design was got out by him on similar lines, but having the regulating parts either in duplicate or triplicate, one regulator governing the pressure in the next, and so on; but, as we said before, the irregularities of the single regulator when on the high-pressure cylinders are unnoticeable.

The effect of the lazy-tong attachment is that of a very compact and powerful lever, so powerful, indeed, that, roughly speaking, the pressure forcing the valve down on its seating is eighty times as great as that exerted in moving the other end of the lazy tongs; and, when it is borne in mind that the valve itself is a little cone not more than $\frac{3}{16}$ inches in diameter, it will be seen how high a pressure of gas can be counteracted by the instrument.

The popularity of the Beard regulator was evident from the state of the works in which it is being made. Large numbers were to be seen in all stages of manufacture, but hardly a single one in stock. "We shall

start making for stock," says Mr. Beard, "in a month or two, as soon as we can, in fact, and then, next September or October, out they all go, as soon as the lantern season commences."

COMBINATION PRINTING OF LANTERN SLIDES.

II.

In a previous article I referred to the necessary preparations whereby the printing of combined lantern slides may be effected, and instanced a very common example met in with, viz., an introductory slide for lecture sets.

In cases where it has been decided to employ ordinary negatives for the various illustrations collected in the body of the slide, and around the edges of which a suitable titling has been provided in the manner previously described, these negatives will require to be furnished with some suitable masks so as to yield a uniform shape to the various views combined within the circle. Of course, in this much will depend upon the nature of the subject. As a rule, where portraits are being treated, oval shapes in the centre, surrounded by a number of small round pictures at equal distances just inside the edge of the title, are very effective; but, of course, there is no end to the variety of forms and styles that may be utilised. Whichever shape, however, is selected, it will be necessary beforehand to see that ample space is provided on the ground glass of the camera, which, of course, means also the same space on the sensitive plate, so as to contain, without undue crowding, the little pictures it is intended to print.

To accomplish this in the case of, say, round shapes, a practical method to adopt is to first describe on the focussing glass the little circles that are to contain the pictures, and care should be observed that these occupy exactly their proper places, such as at equal distances from each other, so as to prevent any eyesores when the slide is projected on the screen.

If the negatives be provided with well-shaped, round masks, these are easily reduced neatly into these little circles, which have been described on the ground glass. Of course, to enable this to be accomplished with ease and certainty, the camera that is being employed must be provided with the necessary front movement for projecting the images up or down, or from side to side, as required, and here again we have a further instance of the practicability of the good old square form of camera over the more modern conical-shaped article, which, alas, is now so much in evidence with those whose photographic experience is limited. Over and over again I meet with amateur workers who regret they ever invested in these conical bellows cameras.

The little circles referred to may be described on the ground glass by means of placing any coin, according to the size desired, and ruling round the edges of the same a sharp line with a hard lead pencil. There is no difficulty in accomplishing this. The preparation of the focussing screen in some respects is just like preparing a design of the slide, and once the shapes, whatever they may be, are on the ground glass in their proper positions, and these shapes correspond with the masks of the negatives, the most difficult part of the operation has been performed, for all the rest is merely plain sailing, and comprises the proper adjustment of the little images inside the circles, with a fair amount of photographic experience as to correct exposure and development of the plate, an amount of knowledge which, of course, no one should be without who attempts such advanced work as I am describing.

In undertaking work of this kind, it does not by any means follow that the entire subject contained in any negative has to be utilised, for it frequently happens that only a portion of a view is desired, and very probably this may be contained in some large-sized negative, such as 12×10 or 15×12, in which case, having decided upon the exact portion it is intended to embrace in the slide, special round or other shaped masks have to be provided of the exact size to suit the amount of view selected. This part of the work the writer knows from experience has often deterred some workers from undertaking the production of such combined slides as we are considering, for the providing of such sized masks is with some a matter of great difficulty, but everything is easy to one when they know the way how to do it, and, to those who imagine this difficulty insuperable, I would merely refer them to an article I wrote in this year's British Journal Photographic Almanac dealing with this subject. When any small circles are needed, an ordinary diaphragm or stop will be found just the thing when such is temporarily fixed over the part of the negative it is desired to copy, hence it is apparent that the entire or any portion of a negative may be utilised for this purpose.

In the example referred to, provided due care is observed in correct registration, but little difficulty will be experienced in producing uniformly perfect results, and such an example of double printing is not by any means so difficult of accomplishment as many suppose.

It frequently happens, however, that it is desired to produce a combination picture, in which portions of two or more negatives are combined in one picture, which shall only convey the idea but that of one negative or original view. Numerous examples of this kind might be mentioned, such as the introduction of a ship in a marine view, or a boat, containing, say, a family group, floating on the sea, or the introduction of some animal on the foreground of a landscape, or any other suitable object, to lend additional interest to a view. When dealing with cases of this kind, masking has to be dispensed with, and recourse had to a blocking-out preparation of both negatives.

In selecting suitable subjects, consideration must also be given to the matter of size, for nothing looks worse than an incongruity in this respect.

Having decided upon the subject it is intended to introduce in the picture, the first step is to block out entirely all the remaining portions of the negative. In doing this it by no means follows that such should be otherwise than for temporary purposes only, and, should the size of this selected object or part be such as not to agree with the surroundings or scale of the other negative, a positive should be made, and this again converted either into a reduced or an enlarged negative, whichever is required, until the desired size is reached.

To enable this object being introduced into the main picture, space must be reserved for it on the sensitive plate after it is printed. To provide for this, the main negative must have an exact counterpart of the object blocked out also.

This may be accomplished by superimposing one negative over the other, and tracing the outline very carefully on the main negative To enable this being done to the best advantage, a special support is required so as to permit of the negatives lying perfectly flat in a horizontal position. An ordinary retouching desk is not so well adapted for this as a box without ends, and from which one of the sides has been extracted. When such is provided, a white reflector placed on the same at a convenient spot near a window will permit of the blocking out being done with the greatest precision.

Of the different mediums suitable for such blocking out there is nothing equal to a good oil colour, burnt sienna, or black, or any opaque pigment. The great advantage of using such oil colours lies in the fineness of the outlines that may be made with such, combined with the ease with which any blocking out is removed, for all that is necessary to bring the negative back to its original condition is to apply a soft rag with a little turpentine, and the paint is removed without having in any way injured the negative.

Oil colours, of course, will not dry rapidly, but it is not necessary that any blocking out should be dry before the printing operation takes place, for such negatives, being intended for use, by means of the copying box nothing is required in contact with their surfaces.

The blocking out on both negatives being completed, the main negative is placed in the copying box, and the image is carefully focussed within the marked-off space on the ground glass of the camera. In doing this the utmost amount of illumination possible should be employed, so as to render as easily as possible the accomplishment of the next step, which is to describe upon the focussing screen an exact outline of the block out in the main negative, which, of course, will be unaffected on the sensitive plate when the same is exposed upon the main negative.

To describe the exact outline of this block out on the ground glass, the aid of a strong pair of spectacles is desirable, so as to permit of very carefully drawing the outline, as a guide into which the other unblocked object has to be registered. In practice, I like to work as comfortably as possible, and when undertaking a job of this kind I prefer to sit comfortably down at the back of the camera, which should always be so adjusted about the right height to permit of the eye and hands working at close quarters, so as to enable the outline being exactly drawn.

A good sable brush and oil paint is as good as anything to employ for the purpose of registering exactly the position of the block in the main negative. This done properly, the exposure is made, the slide closed up and withdrawn from the camera, care being taken not to shake or alter the sensitive plate or carrier in the slide. The object negative is then taken and placed in the copying box, and the camera adjusted to the required distance that will just permit of the objects registering exactly to the outline drawn on the ground glass. This done, the same plate is then exposed on this negative also, and, provided the exposure has been correct and the various manipulations carried through carefully, an exceedingly interesting photographic feat will have been performed, and one that will at all times command interest on inspection from brother workers.

This work only wants a little practice to enable successful results being achieved; it comes quite easy after a little practice, and but little consideration will be needed by any one to see that a wide field of interesting subjects may be selected as specially suitable for combination printing of this kind.

To enable the various parts being correctly joined in one and the same picture, the utmost care must be observed in registering on the ground glass. I have tried numerous methods of marking the focussing screen for this purpose, and for very fine work there is no better plan to adopt than that of placing very fine threads or hairs on the inside of the focussing screen. With such the very finest lines can be superimposed, and I know of no better plan for holding these guides in position than small pieces of wax attached to their ends. When such are adjusted on the *inside*, there is no danger. When examining the picture with the aid of a focussing glass of their being removed, these threads may be stretched the entire length of the glass, and they form the best test I know of for ascertaining when the sensitive plate and the marks on the ground glass coincide; they can be altered in position by merely changing the knots of wax, and, of course, they permit of the focussing screen being kept comparatively free of marks, and thereby enable the picture to be seen more easily when being adjusted. I have seen some focussing screens so full of pencil marks, that it would be quite impossible to make very fine adjustments over them. The threads or hairs when removed leave no marks behind them.

When reducing large negatives, such as 15 × 12, to sizes of one inch or less, the services of a short focus lens must be employed. In fact, it is well to have lenses of varying foci to undertake the work properly.

T. N. Armstrong.

THE OPTIMUS INCANDESCENT GAS BURNER.

Perken, Son, & Rayment, Hatton-garden.

The attention given to the use of the incandescent gaslight for projection and enlarging has induced Messrs. Perken, Son, & Rayment to devise the neat little system, which is depicted in the illustration, for



adapting the light to the lantern. It includes burner, glass chimney, brass arm, regulating tap and tray or the arm only, and the arm and tray can be had separately. The system is easily adapted, and is inexpensive, besides being cleanly in working.

FLASHLIGHT HINTS.

[Anthony's Bulletin.]

Flashlight portraits are not always successful, and, in the majority of cases, this is due to the fact that the flash is made just above and behind the camera. The result is invariably a flat, lifeless picture. Now, it is an established fact in outdoor photography, never, if avoidable, to photograph an object with the sun directly in front of, or behind, the lens. The same principle holds good in indoor work. To obtain the best results, the light must come from the side, and with the flashlight it is possible to produce results that can only with difficulty be distinguished from properly lighted daylight exposures. The flash may, and should, be fired on the side of the sitter, and the use of a properly placed reflector on the other side will obviate harshness or dense shadows. The direct light must, of course, be screened from the lens, and this is easily done. Another difficulty is the staring effect produced by the desire of the sitter to obey the injunction of the operator to "keep your eyes open." A fair amount of illumination in the room, such as the lighting of the gas or lamps, will do away with much of this trouble, but thorough confidence of the sitter in the result and a knowledge of just what is going to happen will help greatly.

A really nervous person will never make a good subject for flashlight work; but, with a model familiar with the operator and with the method to be employed, really good work may be done. Flashlight photography offers many inducements to the amateur photographer, and much in the way of perfecting it may yet be accomplished. As used at present, a large amount of light is wasted, for but a small quantity of the light produced by the burning powder is really reflected from the subject, through the lens, to the plate. The powder is fired while in bulk, and the flame is of considerable thickness. Now, flame being opaque, only that portion nearest the sitter is of practical utility, and until some method is devised by which the powder may be used in the form of a thin sheet, suspended and fired, so that practically every grain of powder tells, the waste will continue.

The late H. Fourtier, of Paris, made an exhaustive study of the magnesium flashlight, and found that, with "from one to four grammes, the intensity of the light increases in proportion to the weight of powder employed; from four to eight grammes it decreases slowly, and from eight to sixteen grammes rapidly. To use more is simply loss. The splitting up of the one charge into small charges yields much better results A charge of two grammes burned at one time furnishes much less light than two charges of one gramme each fired simultaneously. A considerable gain in light for a given weight is always obtained when the powder is burned in several small charges. Moreover, in this way the flame thus produced occupies a large space, and, the light being thus spread, the shadows are softer, the subject better modelled, and very remarkable effects may be obtained."

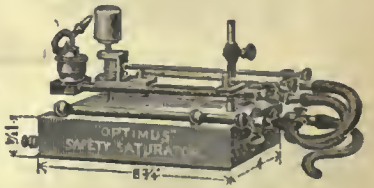
The acetylene light will, in the near future, be available for photographic purposes, and will, we believe, be of such actinic power as to render it comparatively an easy matter to obtain a properly timed exposure in a few seconds. Much, however, in the way of experimenting must be done with the new illuminant. Word of a serious explosion in New Haven has just reached us, but the details are not yet known. Acetylene will undoubtedly play an important part in photography, and the progress made with the new gas should be watched by every progressive photographer. Of course, the light most preferable is that given by the electric arc, and there is every evidence that before long every professional photographer will consider an electric lamp a vital part of his outfit, either as an auxiliary to, or as an absolute substitute for, daylight.

THE OPTIMUS SAFETY SATURATOR.

Perken, Son, & Rayment, Hatton-garden.

Since its first introduction, the Optimus Saturator of Messrs. Perken, Son, & Rayment, to the practical value of which we have before paid testimony, has been rendered still more effective by several minor improvements, and continues to be very popular with lanternists. We append the instructions for using the new and enlarged saturator. They are admirably clear, and give a very full idea of the way in which it is worked:—

To charge: Unscrew large stopper plug (filler) on the top of saturator and the small overflow plug at end of saturator. Pour methylated ether into the filler until it runs out from the overflow. The saturator should now be stood upon its end until all fluid ceases to drop from the overflow, when both plugs should be very tightly screwed up into their respective apertures. To connect: Attach one end of a short length of rubber tube to the outlet tap of saturator, and the other end to the hydrogen tap of jet. Attach one end of another rubber tube to the regulator connected with oxygen cylinder, the other end to be attached to the direct nozzle of the inlet tap of saturator. The branch from the inlet tap of saturator must now be connected with the oxygen tap of jet by a third piece of rubber tube. Immediately *before* lighting up, turn on outlet tap so as to let the saturated oxygen fill the connecting tube and the tube of jet, so driving out all atmospheric air from those tubes. To light up: First see jet taps are turned off; then turn on inlet and outlet taps of saturator. Now open valve and admit gas from oxygen cylinder, apply a light to nipple of jet; at the same time turn on etho-oxygen tap of jet until the flame is as large as that given by an ordinary house burner; then very gradually turn on pure oxygen tap of jet until you obtain incandescence of lime, without any hissing sound whatever. As you turn on the oxygen tap of jet it will be found necessary to slightly increase the quantity of the mixed etho-oxygen by the tap of jet. To turn out light: first close etho-oxygen



tap of jet, then the pure oxygen tap of jet, after which turn off saturator taps, and, finally, close valve of oxygen cylinder. The above is the proper order, and the routine recommended, but no danger need be apprehended if it be inadvertently departed from.

Crucial experiments have demonstrated the absolute safety of the Optimus Saturator, which for compactness, practicability, and the good quality of light it yields, is unexcelled.

MANCHESTER PHOTOGRAPHIC SOCIETY.

FEBRUARY 26.—Mr. J. W. Wade, of the Manchester Amateur Photographic Society, gave a description of the

VARIOUS TONES SUITABLE FOR DIFFERENT SUBJECTS IN LANTERN SLIDES,

which was illustrated by nearly 100 slides shown on the screen.

Architecture was first treated of. Old buildings and church interiors should be of a warm-brown colour, newer buildings and the interiors of cathedrals, where white marble or stone predominates, should be of a cold tone. Sculpture was next dealt with, several fine studies being shown of groups at Eaton Hall. Mr. Wade, in order to obtain the warm tones, uses the hydroquinone developer, with the addition of ammonium bromide. He had used the developer in conjunction with carbonate of ammonia, but found it blocked the shadows. Nature is beautiful in any season, as was illustrated by the bare boughs of spring with brownish black colour, *A Summer's Day*, of a reddish-brown, autumn brown, and several hoar-frost scenes of a black and blue-black deposit. The black tones are obtained by the use of hydroquinone with bromide of potassium in place of bromide of ammonium, and shortening the exposure. Mr. Wade was one of the first to observe how beautiful were the effects to be obtained by the chemical toning of lantern slides, and showed a number of cloud and seascape pictures illustrating his method. The slides which call for special mention are *Sunset at Llanberis* and *Bradda Head*. The plates used are the Alpha, and by a long exposure a red colour is obtained with their developer; after fixing and good washing, the plates are toned either locally or all over.

The toning solution is as follows:—

Ammonium sulphocyanide	60 grains.
Carbonate of soda	3 ,,
Gold chloride	2 ,,
Water	6 ounces.

This solution takes the plate through all the stages from red to brown, purple, and blue.

Mr. Wade was listened to with great attention, and hearty thanks were accorded to him.

Mr. H. M. Whitefield gave a demonstration of his method of printing clouds in lantern slides, and, in his introductory remarks, said that, with rapid plates and *f*-45 stop, the exposure for clouds was about one second. It is always better to study the clouds, their shape and balance, in order to suit the landscape into which they are to be introduced, as a picture is generally made or marred by the clouds. An angle of 45° from the sun is the best standpoint for taking them, but it generally depends upon from which side your landscape is lighted. Mr. Whitefield use a printing frame of his own manufacture, in which the landscape slide is put between the cloud negative and lantern plate; the back of the slide is made non-actinic by rubbing on the glass side a mixture of burnt sienna, glycerine, and gum water, and the whole is exposed to the light, the landscape slide making a mask on which to fit the cloud. It is not advisable to put the cloud on the same plate as the view, as in the case of a light church spire against the sky it is difficult to put the cloud on it without some mask. A slide was then exposed and developed, the developer being hydro-cum-eikon, and, after fixing, was put through the lantern. The method was much admired, and should commend itself to all who seek to improve their slides by the suitable introduction of clouds.

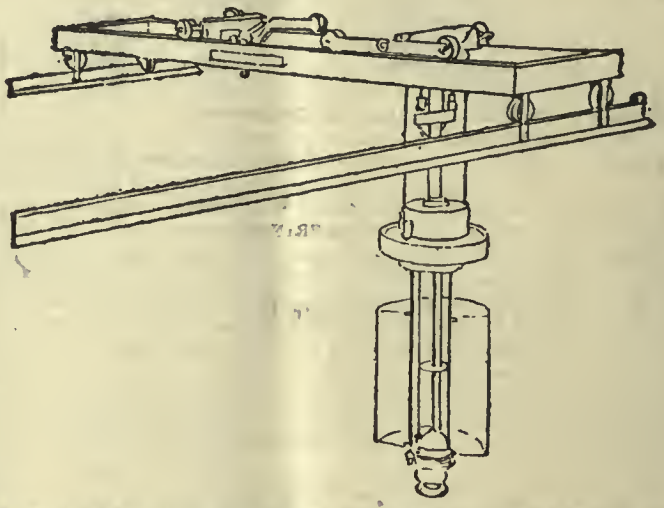
ROGERS' TRAVERSING GEAR FOR ARC LAMPS.

WE have recently had our attention called to the above-mentioned apparatus, which will probably prove a very valuable adjunct to the studio of firms who carry on the work of process-engraving, photo-etching, and photography.

It must be apparent to every one who is accustomed to the appearance of studios fitted up with the old appliances that the cranes, ropes, and loose wires, which almost fill the upper part of the studio, are extremely unsightly, and indeed dangerous, to say nothing of the light being blocked out by the network of cables and ropes, &c., which are by this traversing gear entirely superseded.

The advantages of the apparatus consist in the fact that the arc lamp can be moved in any direction whatever with regard to the copy, that is to say, it can be swivelled round on its own axis; it can be raised and lowered, it can be moved across the studio, or along the studio, with the greatest facility.

The whole of the current is conveyed along the traversing rails, upon which the cradle which carries the arc lamp moves, and is conveyed through the carrying wheels of the cradle, thence through the conductors embedded in the woodwork of the cradle, thence through the supporting



wires of the arc lamp, through the lamp itself, and back again in the contrary direction to the dynamo.

The illustration given herewith, will sufficiently explain the working of the apparatus. Mr. Henry J. Rogers, M.I.M.E., of the Watford Engineering Works, Watford, near London, is the sole manufacturer and patentee of this apparatus, and he has fitted up the majority of the studios in which the above processes are carried on, and he is, at the present time, supplying his patent gear to studios in Bolton, Newcastle-on-Tyne, Watford, Bushey, Bath, &c., &c.

Mr. Rogers, also applies his traversing gear to portrait studios, the arc lamp being in connexion with large parabolic reflectors suspended from his traversing gear in the same manner as above described.

ROGERS' BEVELLING MACHINE FOR PROCESS WORK.

THE bevelling machine, illustrated below, also will be found of great service to photo-etchers, as the edges of the plates can be bevelled in an incredibly short space of time with a perfectly true line at the edge of the

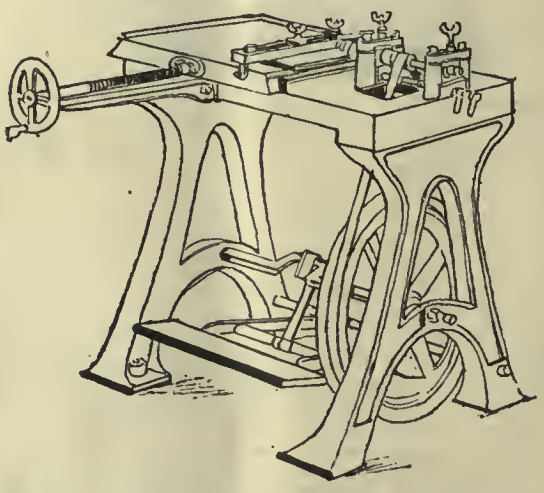


plate. The cost of this machine is very slight as compared with other machines of the same description.

We notice also that the manufacturer of the above apparatus has fitted up a large number of studios with gas and oil engines, and all necessary power for supplying the current to the arc lamps used, and a skilled electrician is at the service of any intending purchasers, free of cost, to advise them as to the best means of applying the electric light to their respective studios.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*April* 3, 1896.

THE LANTERN RECORD.

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LANTERN MEMS.

What is the practical outcome of the Home Office inquiry into the "causes of the explosion, and the precautions required to ensure safety of cylinders of compressed gas?" Such is the natural question asked by those interested, and, as all lanternists have not the time to go through the sixty-three pages of folio-size printed matter comprising the report, it may be useful to analyse the conclusions, and refer to the experiments conducted with a view of proving the truth or otherwise of certain theories or views propounded by men whose ideas were worthy of consideration.

* * * * *

First and foremost, it was conclusively shewn that, provided the cylinder was made of good material, of a certain thickness, and duly annealed and tested, in accordance with the excellent arrangements now adopted by the gas-compression companies, it was perfectly safe for use with either oxygen or hydrogen (and coal gas) at a pressure of 120 atmospheres, or 1800 pounds to the square inch. Second, that the Committee were perfectly satisfied with the arrangements for compressing gas, and, while those self-imposed regulations remained in force, users of gas and the public need have no concern on this score.

* * * * *

It is a great compliment to the gas-cylinder makers and gas-compression companies for the Committee to express themselves in the following terms:—"It should, however, be stated that up to the present time the trade in compressed gas cylinders has been carried on both by manufacturers of cylinders and compressing firms with great care and skill. The number of accidents, considering the extent of the trade, has been very small, and the number of fatalities has been small also." Regarding the regulations affecting the trade, the Committee found that they were not altogether consistent, for there were different regulations in force by the railway companies, the Board of Trade, and the London County Council. It is to be hoped, now the matter has been so thoroughly investigated and reported on, that regulations for the conveyance and use of compressed gas will be put on a practical and sound footing.

* * * * *

Regarding the causes of explosions, only two fatal accidents have occurred through faulty cylinders or accidental mixture of gas, the other two referred to in the report in connexion with compressed gas being due, in the one case to pure carelessness in doing experimental work with mixed gases and purposely igniting them, and the other at one of the gas-compression companies' works, and ascribed to "causes such that no general regulations would have prevented." Considering these accidents are spread over a period of ten years, and that there are an enormous number of cylinders in use, the small number, although lamentable, is really less proportionately than those due to explosions of steam in boilers, &c.

* * * * *

Some idea can be formed of the enormous number of cylinders in use, when one company, in London, alone turned out, in 1894, 100,000 cylinders, that is, filled or refilled this number with compressed gas. The report says "that, looking at the magnitude of the trade, the risk to the public and to users of the gases, and the partial and imperfect regulations attempted by the action of the railway companies, the Committee think that some control of the trade, by official inspection, is required. The inspector should have the right to examine the specifications to which cylinders were manufactured, and inquire into the precautions taken to secure proper thickness and complete annealing, to examine the records of tests, and occasionally order tests of cylinders for his own information. He should, acting in accordance with instructions, order the reannealing or retesting of cylinders."

* * * * *

This seems reasonable, and, no doubt, would be welcomed by those compression companies, that have, for some time past, made such arrangements for the desired excellence in make of cylinders, and taken complete precautions as to filling, for then competition that might lead to cheapening and to their possible detriment and safety would be judiciously restrained, and made to conform to regulations that experience has shown to be necessary and advisable, for the certificate would be withheld from factories where the arrangements were unsatisfactory, or withdrawn on the report of the inspector that instructions were not carried out.

* * * * *

Another important duty of the inspector, should he be appointed as suggested by the Committee, would be that "he should have the right to test the pressure gauges, weighing apparatus, and other appliances, and to require alterations to be made if they were unsatisfactory. He should occasionally examine cylinders to see that they were not over-filled." This will please some of the lanternists who have written to the technical journals about getting more gas than they paid for; but, as no known case of explosion has been traced to over-pressure of gas in the cylinders (except the one in New York), they need no longer have any anxiety, especially as automatic and reliable safety valves will have to be fitted (if not already done so) to *all* compressors.

* * * * *

It is well known that for ballooning purposes in the English, French, and German armies the cylinders, although of a much lighter make than those lanternists are in the habit of handling, are filled to

much higher pressures—generally 200 atmospheres; but the report says, "the conditions of their use place them outside the range of this inquiry." In fact, Mr. Thomas Atkins and his Continental prototype must look after themselves, and take their risk of being sent to "kingdom come," whether it is by a shell or bullet of the enemy in time of war, or an over-strained gas cylinder in time of peace.

* * * * *

THE press still talk about the cylinder explosion in Holborn as one of compressed gas, and a usually well-informed evening paper, in its scientific notes, which are always interesting and, as a rule, carefully written, starts by way of introducing the subject of the Committee's report as follows: "The recent lamentable death of a chemist by the explosion of a cylinder of compressed gas will draw attention to the report of the Committee appointed last May to inquire," &c.

* * * * *

THIS sort of thing is likely to do a lot of harm to the lantern industry by keeping up the dread of gas cylinders. The way in which most extracts are given is anything but "comforting," for the lay papers boil the report down to such a small compass that they simply tell you either that "explosions are due to negligence in the manufacture, annealing, and testing of the cylinders, and the lack of care in filling," or else that the force of the explosion of a gas cylinder filled with compressed gas in a *mixed* state is equal to the force of an explosion of so many pounds of gunpowder, dynamite, or cordite.

* * * * *

IF they would mention, as *per contra*, that the Committee, despite all their knowledge, patience, care, time, and experiments, were not able to *prove* that the cylinders of commerce are ever filled with mixed gases of an explosive nature, or that they would explode of their own accord, or could be made to explode when purposely so filled, and with oil in the fittings, pieces of steel in the cylinders, or any of the other supposed automatic detonators—in fact, that explosions could only be produced by electrical ignition—all the results, as far as the tests went, were of negative value—*none* of the theories could be *proved*.

* * * * *

THE boom has set in for the animated pictures, and once it was installed in one of the principal "variety houses," the others, in rivalry, would sure to try and secure a similar attraction. Now, the "Cinematograph" is to be seen at the house on the north side of Leicester-square, and the "Animatograph" (late Theatrograph) at the house on the east side; in other words, one is at the Empire and the other at the Alhambra Theatre of Varieties.

* * * * *

I SHOULD have liked very much to have written something this time about Mr. Birt Acres' apparatus and its projections, but, having twice been to Regent-circus to try and see the "Kineopticon," and found the place closed and no announcement as to time of exhibition, I can only suppose that it is not quite ready for the public; or, perhaps, we shall hear of it at the other large variety house, viz., the Palace, for, as I heard some one remark, it might be politic on the inventor's or agent's part to "hold his hand" for a while.

* * * * *

THOSE who would rather see the Cinematograph at its original London home can still do so at each hour after two at Marlborough Hall, and I understand many avail themselves of the opportunity in the afternoon, but not so many in the evening; perhaps "science" is best studied in the evening, accompanied by music and gaiety, as was once the case with a society which met in the building of a variety house, and discussed or had lectures on nearly every subject but that which gave the title to the society; and it was the text for many a joke, not only at the expense of the society, but also to the worthy and respectable paterfamilias, who was accused of having an "evening out" on the pretext of science or exploration. It has now changed its meeting place, but is still cosmopolitan in the subject-matter of its lectures.

G. R. BAKER.

EXPERIMENTAL WORK WITH A LANTERN.

IN previous notes we have considered the formation of colour from the spectrum by the aid of prisms, and coloured solutions, and glasses. A very pretty experiment to show the formation of a spectrum, by diffraction, is to use a grating. Circular gratings, ruled with about 2000 to 3500 lines to the inch, may be obtained at fairly reasonable rates from many opticians, and one of these, placed between the condenser and our home-made optical front, will show a more or less satisfactory image of circular spectra. The light from the condensers should be cut down to a point, and a fairly stout dark green or chocolate mount, cut down to the regulation lantern size, and a pinhole made in the centre, must be placed between the condenser and grating.

The production of colour by interference is by no means easy with the lantern, in fact it is so often a failure that it is better left alone.

There is one method of producing colour which is, of course, well known to all, I mean that which is pursued in projecting three-colour slides. For this a triple lantern is essential, and, whilst it may not be possible for everybody to show actual three-colour slides, the principle may be easily explained. A good deal of mystery has been hung round this subject, and quite unnecessarily. The only difficulty is to procure the three colours to make white light.

Of course, theoretically, the filters should be so chosen as to excite our nerve fibrils in accordance with the curves of Clerk Maxwell or the more correct ones of Koenig; as a matter of fact, common glass may be used with a brilliancy of results which is startling. We require a red, a green, and a blue-violet glass. For the green, pot-metal chromium-green glass should be used; for the blue violet, a pot-metal cobalt-blue glass; these are easy enough to be obtained, because the above are the trade names for them. The red glass with which I have been most successful has, unfortunately, no trade name. It is, however, used for some dark-room lamps, and, when examined by daylight, has a distinct vermilion or orange-red shade, not a ruby.

For the success of this demonstration, it is advisable to obtain as good register as possible of the three discs. The coloured glasses should not be placed next the condenser, but in front of the objective. If next the condenser, all the bubbles and imperfections will be focussed and show upon the screen, whereas, if the glasses are placed in front of the objective, we merely get the blaze of colour, and nothing else.

Besides the glasses, we want some patterns. These can easily be made by sticking lantern-slide binding strips on to cover glasses in some set pattern, only the patterns must be different on each glass, or rather not all alike. A simple pattern can be made as follows: On one glass stick a binding strip running from the left top corner to the bottom right corner. On the second glass place a strip the reverse way—that is, from the top right corner to the bottom left corner. On the third glass put two strips crossing in the middle at right angles.

We will now proceed to demonstrate the formation of the colours. Place the red glass on the top lantern, the green glass on the middle one, and the blue-violet glass on the bottom lantern, and, without any slide, turn on the top lantern and explain that this excites our red sensation nerve. Turn this out and throw on the green; explain this. Turn off the green and throw on the blue-violet. Turn this out and again turn on the red, and explain that you have shown what are usually called the primary colours, or those which excite the three primary sensations, and then state that you intend to show the formation of the intermediate colours, yellow and blue. Now, having the red disc, gradually turn on the green, when the disc will change gradually into orange and then yellow, and, by turning down the red, into greenish-yellow, yellowish-green, and finally pure green when the red is quite shut off. Now, by gradually mixing the blue-violet with the green, the disc becomes first bluish-green, then greenish-blue, and finally pure blue; and, by turning off the green, it changes into violet-blue, bluish-violet, and finally our original violet when the green is quite out. By mixing the red with the violet, what might be called purple is formed, and finally a bright crimson, to which the addition of green makes white. This is

always a taking experiment, and, if properly rehearsed and carried out, generally fetches the house down.

Now proceed to show the formation of colours. Leaving all the jets burning, close the flashing shutters of two of the lanterns, and take out the coloured glass of the third, and throw on the screen one of your diagram slides to prove that it is merely a piece of plain glass with a black paper on it. Then withdraw this and insert the coloured glass, mix the three lights so as to again obtain white, and insert one of your slides in the red-light lantern; immediately you will obtain a white disc crossed by a band of bright blue, and explain the formation of this by saying that all you have done is to stop out the red light at that place, leaving the green and violet to combine to form the blue.

In the middle lantern insert the second of your diagram slides, when immediately another band of colour will cross the other, but now this band will be a combination of red and violet, or crimson. The centre, where both the bands cross, will, of course, be pure violet, because here we have stopped out the light from the green and red.

In the third lantern insert your cross when immediately the centre of the screen becomes black, and the right-angled cross bright yellow, because the diagram slide has here stopped out the violet.

In performing this experiment, it must clearly be understood that equal illumination is absolutely essential, and, if the glasses are not correctly chosen, it may even be necessary to reduce the illumination of one lantern to make up for it.

The remaining method of showing the formation of colour is by means of the polariscope and mica or selenite films, but the apparatus for these is so costly, that it is, as a rule, beyond the reach of most would-be experimenters, though, if the apparatus can be hired, by all means get it. PHAROS.

SOME ODD DODGES IN LANTERN-SLIDE MAKING.

BUT very few lecture sets will be met with that do not contain some subjects that have to be copied from either an old wood-engraving or the more recently produced process block picture, and when either of such illustrations fail to be photographed for the purpose of making lantern slides, some special method of undertaking the work must be resorted to, so as to avoid an unpleasant coarseness of many portions of these parts represented by bold lines or strokes, as in the case of any ordinary wood-engraving, or by the magnified dots in the case of half-tone pictures taken by means of a ruled screen when such are projected in an enlarged form by means of the lantern.

As I write, I see before me a very pronounced type of such in the instance of an old wood-engraving executed many years ago, but which is of especial value as being the only available illustration of the kind possible of attainment for the purpose required in the lecture. In examples of this kind it is by no means uncommon to find cloud effects represented by bold strokes or lines which as a rule offer no appearance of incongruity when viewed in conjunction with the rest of the picture in its original form: but these bold strokes or lines appear quite different when thrown upon the screen in an enlarged form.

The practice of obliterating these strokes or lines by means of a wash colour has sometimes been resorted to, but it will be quite obvious to many that but very few examples will ever be placed in the hands of a photographer upon which such a liberty would be permitted as the doctoring of the face of a highly valuable picture, not unfrequently met with in books or other bound forms, by means of a colour wash applied with a brush, even although such may be partially, if indeed not entirely, removed eventually by means of sponging such parts as have received an application of such colour wash.

Doubtless there are many other instances of pictures of the penny-dreadful class where such a method of treatment may be followed, and when such is applied skilfully and a judicious amount of positive retouching or working up of the surface has been resorted to, a marvellous improvement in the appearance of the original will have been produced, and this is reflected in a like manner when the lantern slide from same comes to be received upon the screen.

Such liberties, however, can be but rarely taken with many of the illustrations of the better class that are frequently presented for the purpose of being copied, so that in very special cases some workers who never object to expend either time or money on their work, but whose one object is to secure the very best results, no matter what amount of time or labour such entails, think nothing of first copying examples of the kind mentioned without any preliminary touching up on the original, the negative obtained from such being printed in the ordinary manner on a suitable paper specially selected to permit of colour washing being performed, a plain salted silver paper or platinotype being very suitable to employ.

Having now a duplicate of the original they are in possession of a print that may be treated to any amount of improvements by means of the lead pencil or colour wash, or both combined, and, when such a mode of treatment is conducted by any one possessed of a little experience at the work, it is really marvellous what an amount of improvement can be effected in this manner.

In many instances, however, it will be found that a very much similar effect can be produced in a much simpler way, and one whereby the necessity of making a duplicate print is avoided.

Many years ago there was a good dodge known to some old collodion workers, who at that time had a complete monopoly of the trade in lantern slides; but then these were the good old days of remunerative prices for such work, and this, as a natural consequence, led to more pains being taken to turn out slides of the very best quality by means of the wet-collodion process. In those days many special slides were paid for handsomely, often to the tune of five shillings each, and, of course, there was an inducement to expend some skill and labour on their production.

But with the present prices, when so many are gasping for orders at the paltry price of sixpence a slide, is it any wonder that many of the old collodion-slide makers keep their experience up their sleeves?

What can any one be expected to produce for the present prices in the way of such slides as I am considering? There is certainly no inducement to expend anything but the merest ordinary amount of labour for such a paltry remuneration, unless it is desired to work at a loss.

No doubt, to a very great extent, lantern-slide making may be said to have passed into the hands of amateur workers, who, owing to the great excellence of the modern lantern dry plate, find the production of lantern slides an operation of much simplicity.

Not so in the good old wet-bath days, when every slide was looked upon with pride as a production entailing an amount of care and experience entirely unknown to ninety-nine out of every hundred who now make a slide.

Is it any wonder, then, that many of the little dodges known to special slide-makers are fast being lost sight of entirely?

I have said that in many cases subjects will be met with that can be treated in a simpler way than by requiring to make duplicate prints first, and then afterwards colour washing, so as to convert lines into tints.

One of the good old dodges applicable to this special class of work consisted in copying such subjects through a fine quality of ground glass.

To many workers of the present day, who think they know all about lantern-side making and copying, such a statement may occasion doubt and surprise, and by some even be considered as nonsense. To those, however, who know nothing of this old slide-making dodge, I would suggest that they simply view the effects produced by placing a sheet of ground glass over a line engraving.

It won't take long to open the eyes and convince a clever worker that underneath this little dodge lies a world of power they never dreamt of; for, by a careful manipulation of the ground glass by means of oil or glycerine, quite startling results in the way of vigour in some parts, and softness in others where the glass has not been so treated, is obtained.

Of course, there are different qualities of ground glass, the finer the grain the better the results will be when used in this work, and the ground side must be placed against the surface of the engraving; as a general rule, however, the quality found in focussing screens in good cameras will be quite suitable to employ for this purpose.

Any intelligent worker will readily conceive the best manner of marking or oiling those parts it is desired to yield the utmost amount of vigour, for, by merely placing the glass over the picture, the outline of such parts may be traced on the smooth side of the glass by means of common writing ink having the addition of a little gum or sugar, and then applying underneath these parts a little glycerine and water or oil.

To those workers who are in ignorance of these simple little dodges quite a new field will be opened up in lantern-slide making.

T. N. ARMSTRONG.

COMPOSITION AND COLOUR; OR, PICTORIAL POSSIBILITIES IN LANTERN SLIDES.

[Journal of the Society of Amateur Photographers of New York.]

WHEN that ill-natured fellow, the art critic, wishes to say something particularly mean about a carefully and conscientiously elaborated

painting, why does he sum up his contempt in the word "photographic?" Is this use of the term as an expression of reproach justified? Is photography, viewed from the art standpoint, something wholly bad? We hear of "the art of Painting" and of "the art of Photography." Has one of these professions an exclusive right to be called "art," and should the other more modestly style itself a "trade" or "manufacture?"

We term the products of all the graphic processes pictures, whether produced directly by the trained hand or through some mechanical means. In a more special sense, the painter claims the term *pictures* for his works alone, and will not admit mechanical transcripts of nature to have any right to the same title. It is with this special, this artist, sense of the word picture, that we have to deal. If we determine what a picture is, in the artist sense, then it follows that the means by which it is produced is entitled to be called *art*.

I think that I may safely beg the question that "hand painting" is not necessarily art, and its products not necessarily pictures. But there is hand painting and hand painting, and, if technical skill alone is made the test, where shall the line be drawn between pictures and daubs? Setting aside the question of colour, it must be evident that in mere correctness of draughtsmanship the best hand work can, at most, only equal the best photograph. Technical skill is admirable, it may be wonderful, and without some of it the making of a picture is impossible, but technical processes alone will not make a picture. The reason that one canvass interests us only long enough to admire the evidence of study and training, while another chains our attention and makes us forget all about paint and methods while we dream over it, this is what we are seeking, this is the reason for limiting the term "picture" to works having certain qualities.

A picture should reveal something more than the mere superficial shell of things; it should contain a personal element as well, showing the emotion or mental attitude of the artist with regard to his subject.

Place two painters before a scene, say an old building. One will paint a poem which will make the beholder feel the history, the joys and sorrows of those who lived and died there, and breathe the very atmosphere of the place. The other will paint bricks and mortar, and cracks in the bricks and stains on the mortar. Set up a camera and you may get more cracks in the bricks and more stains on the mortar, if that is what you want. And this is what the art critic means when he calls the painting of one of these men "photographic." It lacks the personal element, and displays only the technical, which the photograph can do just as well. The critic implies, however, that the photograph cannot embody any of this personal element, and that its production is not entitled to be called art in the same sense that a fine painting is. In this assumption I cannot quite agree, though I must allow that he has much apparent reason for placing a low artistic estimate upon photography. Photography cannot embody the personal element, or translate the artist's feelings towards nature to the same degree that painting may, but I believe that it can still embody enough of this quality to produce true pictures, and thus to be truly a fine art. Art, of whatever kind, is the expression, the embodiment, of human thought. What are called the "fine arts" express the higher thoughts or emotions. Emotion may be fully rendered only by music. The capabilities of painting come next, where the colour element has full play, and all the graphic arts may incorporate more or less of this human soul quality which makes the difference between true art and dry collections of graphic data.

Photography, as practised by Robinson of Tunbridge Wells, England, and Sarony of New York (to name but two in original lines out of many noted names on both sides the ocean) often succeeds in attaining a real art quality; but, as practised by the professional who makes cabinet portraits at ninety-eight cents a dozen, with a life-size crayon and frame and picture wire and screw eyes thrown in, or by the amateur who goes about pressing the button of his Kodak a hundred times a day, it *sometimes* fails in reaching the art standard.

"You-press-the-button-and-we-do-the-rest" is often followed far too literally. The "rest" that is left to the professional is frequently expected to cover nearly the whole ground, and to make up for all sorts of deficiencies, ignorances, and carelessness. The most important part of making a photographic picture is the part done before, and at the time of, pressing the button; selecting the subject, getting the best view, and the most effective light; including the right amount of view, and giving the proper exposure.

Painting, at present, is certainly much indebted to photography, however reluctant she may be to admit it. Through photography and reproductive processes dependent upon it, copies of good pictures have been multiplied, and the public eye and taste are being educated to a degree which without such aid would be impossible. And there is no doubt that, on the side of good draughtsmanship, art has profited by comparison of her lines with the accurate tracings of the sun. Photography, on the other hand, is wholly indebted to the older art for there being any such thing as making pictures, and for all the ideas of structure or composition that go into them. She should not, because of her unsurpassable accuracy of delineation, disdain to learn of her big sister all she can, so that eventually her name cannot be used as a reproach to hard-and-dry productions of paintcraft.

In science, photography has accomplished wonders, both of discovery and record, which place her among the foremost of modern agencies for the advancement of knowledge. She has pushed discoveries in astronomy far beyond the power of the human eye to perceive, even when reinforced by the most distance-piercing telescope, and she has recorded another universe of facts moving in spaces too small for the unaided eye to find. We know not how near she has come to reaching the outermost bounds of space, nor to getting down to the ultimate atoms of matter; but we do know that she has contributed much to every department of science. If she has advanced but slowly over the threshold of the Temple of Art, before whose portals she first saw and used the light, and to whose service she first offered her powers, is not Art herself somewhat to blame? She turned a very cold shoulder upon Daguerre's child, fearing it would grow into a formidable rival. But photography has now grown up and has never harmed the Muse of the palette and paint rag. In the matter of portraiture, where rivalry was most feared, the Muse has certainly gained appreciation of the fact that the owl eyes and pussy cat mouths, and insignificant hands and feet which were so much admired by our ancestors are never natural or beautiful. For this service alone, photography is entitled to all possible help in the art of seeing and representing things broadly and grandly, and arranging her subjects in accordance with the principles of æsthetics.

In the past, photographic art has been handicapped by defects in the process and materials. Until recently it was impossible to render true colour values, and almost impossible to avoid a certain exaggeration or intensification of detail, trivial minutiæ which very seriously militated against æsthetic breadth.

For the benefit of those who are not photographers, I will explain that "colour values" are the degrees of brightness or darkness in the various hues of nature. If we call black zero and white 100, then a light sky blue might be about 80 in the scale, and a brilliant orange the same, while a deep blue might fall at 50 or 25. With ordinary photographic plates these values come out reversed. The light blue will be the same as white or 100, the deep blue about 80, and the orange, which should be the same as the light blue, will appear as a dark grey shade of only 25 degrees of lightness, or perhaps almost black. From this fact and from the intensification of detail, already mentioned, and which depends partly upon chemical action, come the well-known phenomena of freckles and deep wrinkles in fair young faces of sixteen to ninety-six summers, and which are corrected by the much-abused art of retouching.

With the new orthochromatic or true-colour-value plates it is now possible to come fairly near a literal translation of nature's colours, and with the study of art principles by photographers we may expect sun painting to take its place as a recognised medium of artistic expression.

A mere collection of graphic materials is not a picture. Things without coherence or mutual relation form only chaos. A picture requires a definite plan, an harmonious arrangement of its parts. Nature may furnish the arrangement or the artist may evolve it. It is almost impossible to find a spot from which some picturesque view may not be seen; yet it is equally impossible to find a spot from which every view or segment of the range of vision shall be picturesque. Here lies the source of much failure in photography, and in painting as well. It is assumed that nature's combinations are always in pictorial form, no matter how viewed or how segregated.

I can give here but a few hints and suggestions upon a subject of endless extent; but the underlying principles are simple, and the artist, once upon the track, finds the application of constantly increasing interest. It is in the hope of stimulating some to study the bringing of art principles into their work that I touch upon a few points which are probably familiar to many of you.

Of the two ways of publicly exhibiting photographic art, the hanging of paper or other prints from negatives, and the projection of lantern slides, the latter is by far the most effective and impressive, by reason of magnitude and brilliance, and the most popular. It is especially the artistic side of lantern photography as distinguished from its scientific aspects and uses which we will consider.

The picture shown on the screen, from an old painting in the Louvre, is one of the most artificial arrangements ever put upon canvas. It was painted by Boucher, the Court painter of Louis XV., and like everything else in that period of gilding and affectation, is an elegant trifle, a design

suitable for a Court lady's useless fan. The swain and shepherdesses are masqueraders; the scenery is theatre setting. The artist never looked out of doors for a single detail. Yet this artist was, in his way, a genius; in fact, he was called the Raphael of his age; and he understood composition, so that, in spite of the artificiality and crowded frivolity of his pictures, they always continue to charm the eye. There is a grace, a suavity, an air of distinction which marks them off from many other works of much greater sincerity but poor construction.

Composition is, if you please, an artificial affair, yet it is all based upon natural laws, deducible from natural arrangements, and even reducible to mathematical formulæ, and we know that dry mathematical statements are the nearest approach possible to the eternal verities. So we will start with the proposition that pictorial composition is the coherent expression of pictorial truth, standing in the same relation to graphic art that grammar does to language. We may, indeed, contrive to express our meaning by uncouth sentences or even by grimaces and noises, and we may also utter polished phrases conveying no particular meaning, but these facts do not weigh against the general necessity for good forms of expression.

The eye receives, as well stated pictorial truths, impressions conveyed according to definite rules of *contrast* governed by *balance* and resulting in *unity*. A single apple is interesting in contrast with something else for a background. It would not be interesting if all around it was apple, indefinite apple. But the single apple hardly forms a composition. It has unity, it is true, but only that of the undivided. There are no parts to interest with their mutual relations, so a mere glance is all that it can claim. Two apples, just alike, are much more entertaining. One is compared with the other, they are equal, they are spaced equally against the background, they balance, they are in unity of exact similarity, they are irreproachable. Why, then, does the eye soon become as weary of them as we are of "the Heavenly Twins?" They lack the chief element of interest, mutual contrast, that unlikeness which goes near the danger line of discord, yet is brought back and harmonised by some common element of likeness. Alike, yet not alike similar, yet unequal, such is the law of contrast that makes the unity of lovers so much more interesting than the likeness of twins. We note the same with the single post the twin posts united by a lintel, and the enhanced interest given by setting them in perspective, or by making one shorter and letting the lintel become a sloping roof, thereby bringing in additional elements of contrast, kept in harmony by the elements common to both.

Radiation is a principle of widest extent in both natural and ornamental plans. Throughout the mineral, vegetable, and lower animal worlds it directs the organization of crystal, flower, and sea star. It represents the energy of the sun, the source of light and of physical existence, and on radiating lines move the centripetal forces which bind the universe of worlds together. Pictorial construction may follow various plans, horizonal or upright bands, diagonal or curved forms, for its chief masses, yet the radiating principle, or, as I prefer to call it here, the principle of convergence, is rarely absent, and frequently forms the whole skeleton of the picture. All perspective views and vistas, like streets and ravines, are based upon converging lines. Such may have the lines actually expressed, forming the most powerful means in the anatomy of the picture for conducting the eye to a focal point. More pleasing is the curved convergence of a country road or winding beach. The lines of convergence are often latent, not expressed, but just as powerfully felt. It is of great interest and value to trace this principle in the figure compositions of the great masters, and to discover the order with which the apparently careless crowds are placed, both in ground plan and perspective, so that the eye will be led to the figure of central importance.

There are thousands of pictures made on the idea of two opposing masses with an opening between Though the arrangement is easily effective, yet it is always in danger of looking stiff and set, like the conventional wings and back scenes at the theatre.

Observe the grace with which Corot composes! In the picture now on the screen (*A Landscape in Picardy*) he gives us contrast in the trees by perspective, contrast again between the forms and textures of trees, cottage, grass, and sky. See (I had almost said hear) the echo of the near cottage in the distant one at the left! Varied repetition is among the chief means of securing harmony. Weigh the beautiful proportion between the two open spaces, between the three principal trees, and the little round dark tree balancing, yet contrasting with the peaked roof. The flow of line across the picture is like the dip of a swallow's wing, and the arrangement of the few elements in this harmony of line and mass seems to me quite analogous to a chord of music.

Good composition will always show a predominance of one kind of line, one kind of mass, the value of which may be greatly enhanced by a contrasting form in harmonious combination. The triumphal arch of Titus has stood for nearly 2000 years as the best model for similar constructions, as well as mantels and doorways, the world over. Simply a well-proportioned rectilinear mass, pierced by an opening, arched to support the weight above, and (incidentally, perhaps, but beautifully enough to form a reason for being) ornamenting the mass by its contrasting line.

The eye is caught by salient points, and it is of great importance that the lines connecting these (which the eye feels, although they are not expressed) should fall into agreeable forms. You will find this principle observed in all well-composed pictures.

Dark spots against light are the rule out of doors, the reverse or "Rembrandt" idea being most available for interior effects.

There is a horizontal arrangement which has been very popular of late years, flowers, &c., being strung out and named with such fetching titles as *A Yard of Pansies*. This is a good decorative idea when not abused.

If the objects to form a picture are all massed on one side or down at the bottom, balance is lost, and unity with it. Balance may be attained, however, by a small telling object opposed to a large mass, on the principle of the small weight at the end of the long steelyard arm balancing the heavy one on the short arm. The eye mediates between the two, and accepts the centre of gravity as a focus. A common error in photography is leaving too much blank sky above a landscape.

Sometimes we find a square composition in a round frame. This never works. Curve goes in curve, and curve will go in rectangle, but rectangles are uncomfortable when forced inside of curves. For this reason, tangency, springing out from the main line by gradual change from straight to curve, is a law of natural growth, giving both strength and grace. But the abrupt change from curve to straight line is unnatural, ungraceful, and weak.

Including too much with wide-angle lenses is another pictorial error. Photography is capable of making, or of marring, in this and in a dozen other ways.

The association of integrity with uprightness is no mere figure of speech. The piers of the Brooklyn Bridge carry the enormous weight of steel cables and loaded roadways as easily as a fence post sustains a cobweb. Their form is in the highest degree dignified and impressive, declaring in the strongest terms that the law of gravitation will hold them in place after the mountains themselves are degraded. Horizontal and vertical lines give stability and repose; on these the eye rests. Oblique lines are elements of unrest, and should be used to conduct the eye to a point of repose. For this reason, lines leading out of the picture are bad, and, if possible, should be avoided. The horizontal line, being a line of repose, should only cross the picture, unbroken, at the horizon or distant limit of the scene.

We must be careful of our accessory figures, and not commit the fault seen in the slide now shown. Here the interest is evenly divided between the boat, and figures, and the beautiful landscape. The figures are too important for mere accessories, and the landscape setting is altogether too much for a mere background. As we cannot get rid of the boat and figures from our negative, the only thing to be done to preserve unity is to sacrifice the greater part of the landscape, leaving only enough to be subordinate to the human element. This might have been obviated by a little forethought in making the camera shot. How many inartistic things we see perpetrated in this way, such as the tramp "artist's" views of houses with the inmates all stuck out in front staring at the camera. When we are photographing the principal business street of a town, it is not necessary to call out all the prominent citizens to form a foreground.

We should be sure of our subject, and then get it up into the position of honour, where it will be estimated for something of value. Turner is said to have sometimes diminished subordinate objects in order to give greater importance to his main feature. Photography can hardly do this, even if it was desirable, but by judicious contriving it can usually get things in artistic shape. In the studio the artist can pose his subjects and compose his picture. Out of doors, he can arrange things only to a very limited extent, in the near foreground. Here he must search carefully for the effective point of view, and wait for the artistic moment of light and shadow.

One should not imagine that the setting upon a pedestal alone confers dignity. The subject must be worthy of the honour; otherwise an anticlimax is produced.

Good art discovers and develops the characteristics of its subject along orderly and harmonious lines, carrying the interest unmistakably to its strongest feature. Good art feels its own capabilities and recognises its limitations. When Leland T. Powers impersonates Uriah Heep, the

characterisation impresses us as in every way admirable. He knows his subject, and he knows his field of work. He is a success. When some barn-stormer essays Hamlet, we feel, as he "tears passion to tatters," that an artistic crime is being perpetrated.

Few writers can produce grand epic poems. Few painters can handle heroic subjects. The majority must develop the possibilities of the idyl, the pastoral, and the *genre*. A. G. MARSHALL.

(*To be continued.*)

A LANTERN WORKER'S WOES.

A LANTERNIST'S lot in life is like the course of true love—it very seldom runs smooth. It has often been remarked that experience teaches, but, if it is true, as has also often been remarked, that only fools will learn by their own experience, it follows that wise men depend for their wisdom upon the experiences of others. Without wishing in any way to set myself up as a guide and philosopher to even the most incipient wisdom of budding lanternists, I think that to chronicle a few of the rugosities which have from time to time materialised upon my path may, perchance, help to smooth over the course of other true disciples of the "Optical, but ever Magic."

I must apologetically premise the remark, however, that the cause of the mishap has not always transpired, and so, from a teaching point of view, the value of the experience is somewhat marred by the fact that the causes which led up to the *contretemps* are buried in oblivion. For instance, there was a peculiar little explosion which occurred at a lecture under the auspices of the Young Men's Christian Association. I do not know how it is—please do not take it as an implied disparagement to a most excellent institution—but I have never yet conducted a lantern show at a Christian Association, either male or female, that *something* hasn't gone wrong. On this particular occasion the lantern, a biunial, had been tried, and found not wanting, the oxygen had been turned off at the cylinder (I was using mixed jets), and the hydrogen turned down to a little bead of flame, to keep the lantern warm until the appointed time should have arrived. The audience—consisting, of course, exclusively of young men of all ages—had taken its seat, or their seats (which should it be, Mr. Editor?), and I was sitting quietly by the instrument, trying to look as if I did not belong to it, as is my wont, for I am a very unostentatious person. The chairman had risen to open the proceedings with prayer, for it is customary in these places to ask a blessing upon the chairman, the lecturer, the audience, and all others gathered beneath this roof, which last, I believe, means the lanternist—it always makes me squirm. The audience had leant forward in an attitude of reverence, and buried its faces in its hats, which had been removed from its heads for that purpose, and all was as silent as the tomb, save for the "cracked, monotonous mutter," as Dickens calls it, when there was a sudden terrific bang from the lantern. The chairman sat down, the young men sat up, and I blushed, though it was not my fault. The noise was caused by a small explosion which had occurred inside the indiarubber pipe leading from the oxygen cylinder to the jet. Now, the two gases must have become mixed in that tube somehow; but how? that is the question. I have vague auspicions regarding a possible leak in the dissolver, but even with that clue the matter remains a considerable mystery. As to the force of the explosion, there can be no doubt. A piece of the rubber tube, about the size of a half-crown, was blown to the other end of the hall, and its natural curvature was entirely reversed; that is to say, the little piece, when picked up, was permanently curved, so that what had been the outside of the tube was now the inside of the curve. As for the remainder of the tube itself, that was quite unaffected, except just at the place where the explosion occurred, and here there was a clean cut hole, as if the piece of indiarubber had been punched out with an oval-shaped steel punch. Of course, it did not take long to remove the faulty place and couple up the rest of the tube by means of a piece of metal pipe, and the performance went off all right, but I always tremble through the preliminary prayer now.

Much more easily explicable was a mishap that befell me, at a Young Woman's Christian Association, some years ago. This time it was in the middle of the performance, which, up to the critical moment, had been "going swimmingly." The first intimation that anything was wrong came in the shape of a sudden "dousing of the glim." The hydrogen had apparently entirely come to an end. The young women smiled, and the lecturer paused, and then asked sweetly what was the matter. I shut off both taps at the jet, and told him as quietly as I could that there was no more hydrogen. This brought him down to the lantern pretty quickly, and the young women tittered. Then he just turned on the hydrogen, and lighted it, and followed with the oxygen, and all was apparently perfectly right. The young women laughed, but the lecturer didn't say anything to me; he just *looked*, and I felt moderately cheap. However, he had scarcely got back to the platform when the light went out again just as before, to the great delight of the young women. This time all our efforts were unavailing, and we were obliged to call for "Lights! lights!" The discreet reader may think that the sudden stoppage of gas was caused by one of the young women surreptitiously pinching the tube, but let me at once clear their characters of that charge. It occurred in this wise: The coal-gas cylinder had been charged for some time—about two months, I think—and the result was a plentiful deposit of a thick, sticky fluid, very much like Stockholm tar, but of a much more evil odour. The cylinder was lying on its side while being used, and some of this fluid had found its way into the aperture, and stopped it up. So we removed the regulator, supported the cylinder in a vertical position, nose downwards, and gradually opened the valve, the young women watching the operations with keen interest. At first nothing occurred, but presently, when the valve was moderately wide open, a quantity of this tarlike fluid was suddenly ejected, and then the gas followed with a roar. The young women shrieked, the valve was turned off, the regulator replaced, and all went on again as merrily as a marriage bell. But ever since that day, whenever the coal gas has been long bottled, I blow out the tarry deposit before commencing the show, and I always work the hydrogen cylinder in an upright position. *Verbum sap.*

Limes are a fertile source of trouble, at least so I find them. Their strong affinity for moisture constantly leads to difficulties; but, as that is a well-known characteristic of all limes, it can be more easily provided for. Soft limes are, as a rule, pretty well made, but that cannot be said of the hard limes, which are necessary when using a powerful mixed jet. For instance, the central hole is very seldom in the centre, and in consequence, whenever the lime is turned, its distance from the jet nozzle has constantly to be adjusted. Then this hole is nearly always choked up with lime dust so tightly that it takes some minutes to clear it out, and this occasionally comes very awkward, as, for instance, when I got hold of a box of "hard" limes, which were not nearly hard enough. Under the action of the jet, these became pitted at such an alarmingly quick rate that I used up nine of them in the course of an hour's show with a double lantern. I was fain to ask an obliging member of the audience to clean out a supply of fresh limes for me while I was attending to the lantern, where a new lime was required almost as soon as he could get it ready. As he broke three of the limes in attempting to clear them, I felt very much relieved when the lecture came to an end, just as I was getting uncomfortably near to the last piece of surface of the last lime.

On another occasion, a small piece of incandescent lime became detached and fell right out of the lantern into the box in which the gas cylinders were, and immediately set fire to a quantity of loose paper which was used to pack the regulators in. Such an incident as this might have led to serious results, for a considerable amount of flame and smoke rose from underneath the regulators before I had time to crush out the fire. If, for instance, the indiarubber tube from the oxygen bottle had been burnt in half, it would have been a very difficult matter to crush out the flames when fed by a plentiful stream of pure oxygen, while the attention of all in the room must have been called to the scene of the disturbance by the sudden failure of the light in the lantern. Even as it was, there was so much smoke and flame that a panic might easily have resulted; but happily the large audience was either a very phlegmatic one, or it was deeply interested in the lecture, and no notice was taken of the episode.

A very curious mishap befell me once at a large London institute where I was operating a biunial lantern with mixed jets. It was at about the twelfth slide that I thought the light in the upper lantern seemed hardly as bright as it had been, and I turned on a little more of each gas. After a few minutes, however, the light began to get distinctly less, and it continued to diminish until it was of less than a quarter the intensity it had at starting. Meanwhile the light in the lower lantern was as good as ever, so I decided to use this singly, and shut off the upper lantern altogether. Judge of my dismay when, after the lapse of about ten minutes, precisely the same thing began to occur in the lower lantern. To cut the matter short, it ultimately transpired that the nozzle of each jet had become stopped up by an internal deposit of some substance unknown. Of course, as soon as this discovery was made, it was easy to remove the obstruction by means of a pin, and to continue the performance again, but it was some little time before I did discover it. And I do not feel at all certain as to the cause of the trouble, though it would seem that the aforementioned tarry constituent in the compressed coal gas had something to do with it, for the hydrogen cylinder

had been charged for some considerable time before it was used at this performance. It is quite conceivable that, under certain conditions, the intense heat which the gas meets with at the nipple of the jet might induce it to deposit one or more of its various constituents, which hitherto had been held in suspension. There seems to be no doubt that compression has a modifying effect upon common coal gas, and that, if the pressure be maintained for some weeks, a point is reached where some of the hydrocarbons, which give it its illuminating power, will become separated from the hydrogen, and be deposited in the form of a thick brown semi-fluid substance upon the sides of the containing cylinder. Now, it is quite possible that, in the above-cited case, the coal gas had *almost* reached the age when deposition of tarry constituents should occur, and that the heat of the jet had hastened the process which was just ready to commence, and caused the tar-like substance to be deposited inside the intensely hot nozzle, where the liquid would naturally be quickly converted into a cinder-like solid. But this is all theory and guesswork on my part. The practical point is that, forewarned being forearmed, the lanternist should defend himself against such a disaster by means of an ordinary pin.

Many and various are the mishaps that have befallen me owing to the vagaries of the British working cabman, the moral of all of which is, Never trust a cabby to turn up at the appointed time. He may mean well perhaps—very likely he does—but his good intentions are easily upset by small things. I have known a cabman to stop away because it was a bit colder than he liked, and I have waited perhaps half an hour for him, and then been obliged to fetch another cab, altogether making me about an hour late at the hall, which means hurrying considerably to get things ready in time for the performance. The railway companies, too, are not altogether blameless in this connexion, or, perhaps it would be more fair to say that the South-Eastern Railway Company is not blameless, for on one occasion they very nearly got me into a terrible scrape. I had a lantern show at a small town in Kent, about twenty miles down the line, and the hall was three miles from the station. The train was timed to leave Cannon-street at 3.35, and I was at the station with the apparatus about twenty minutes before that time. At 3.45 they were loading the luggage van with fish packed in boxes, and nothing could persuade them to put my apparatus in first. At 3.47 the last box of fish and the lantern box had been placed in the van, when the station-master, who all this time had been growing impatient—for twelve minutes late in starting is a good deal, even for the S. E. R.—gave the signal, and the train began to move out of the station. I had just time to snatch up the two boxes containing the sheet and the slides, and other paraphernalia, and rush after the disappearing train, and jump into the van, before a porter bolted the door on the outside, so I was alone with my misery (and the fish), and the gas bottles were left behind. I was released, on arriving at my destination, just in time to telegraph for the bottles to be sent on by the next train, and I had to arrange with the fly proprietor to take me to the hall and come back for the gas cylinders. In the sequel, they did arrive all right, and in pretty good time, but it was an anxious time for me until I got my two "babies" safe in my arms.

These same "babies" nearly got me into a somewhat similar scrape at another big railway station. It was just after the famous explosion at Fenchurch-street Station, and, for the sake of argument, I had packed them up together in a travelling case, in the fond hope that they would pass the official eye as a change of raiment. As a matter of fact, it did pass the official eye, but, when the official came to lift the case, he speedily came to the conclusion that "this 'ere couldn't be personal luggage." We argued it out, but he suddenly tested the matter by *weighing* the trunk, when, to my horror, it turned the scale at over a hundred pounds. However, I soon saw that what the man wanted was a little of that key which unlocks most doors. He got his backsheish, and I got my babies, but it was a bad half-minute when they were put into the scale and found wanting, for I thought they would be taken from me, and that I should be left desolate. "Verily the weigh of transgressors is hard." C. Milton Haydon.

THE DANGER IN THE USE OF FLASHLIGHT POWDERS.

Caution may be mistaken by some persons for timidity, says Mr. W. M. Stine, in *Anthony's Bulletin*, while confidence may seem to bespeak familiarity and practical knowledge; but there are many cases in which such erroneous ideas lead to disastrous results. This is emphatically true, both of the preparation and use of the various flashlight powders. Perhaps too scant attention has been directed to such dangers, and frequently one sees formulæ, which the chemist would regard as highly dangerous, given without a word of caution. Not a few of the flashlight compounds may be classed as high explosives, while it may safely be said that the operation of every flashing device, except the electric spark, may be considered as an explosive. Caution, then, in the use of such substances is highly commendable.

The danger is by no means confined to the ranks of the amateur photographer, for experience has shown that the scientist and practical photographer are not exempt. The experimenting habit is strongly developed in the amateur. When he desires to use a flashlight he will frequently consult a book of recipes and formulæ, or the files of some technical journal, for directions to enable him to manufacture his own compound. While the spirit of experiment is a laudable one, in this case it is to be condemned, unless the experimenter be thoroughly versed in chemistry. It is a safe rule to allow the chemists to do all the experimentation, and purchase the flashlight powder already prepared. One may safely add that precautions cannot be too strongly laid down in the circular of directions accompanying such preparations; and it might not be amiss to suggest that the periodicals and journals always accompany a flashlight formula with the requisite precautions.

The base of such preparations is usually either potassium chlorate or nitrate, to furnish the oxygen to combine with some highly oxidisable substance, such as some metallic sulphides or phosphorus. These substances should never be triturated together in a mortar. Each should be separately ground in a clean mortar, and the mixing be effected with a spatula, and done gently, to avoid heating by friction or blows.

In Chicago alone, in the past few months, the flashlight has been responsible for several bad accidents. In one case a professional photographer was mixing a large quantity of powder, as he was in the habit of making up his own preparation. It accidentally exploded, and partially wrecked the studio, and set fire to the building, besides burning the operator very seriously.

A case within the experience of the writer may be cited. Several years ago, a professional chemist was experimenting with a view to develop a slow-burning flash powder. A compound of powdered magnesium, potassium chlorate, and sugar was used. This gave excellent results, but yielded too much smoke. On one occasion black sulphide of antimony was added, to increase the intensity of the light. While firing a charge the experimenter burned his right hand very badly. The addition of the sulphide caused such a rapid explosion that the flash spread laterally, owing to the cushioning of the air. Such powders can only be fired with safety by the use of a torch or fuse.

Mr. Frederick Wilhoit has kindly furnished the writer the particulars of an accident which recently occurred to him. He states that he had been using a flashlight powder which, when fresh, exploded rapidly and was almost entirely odourless. The powder was made according to the formula:

Chlorate of potash	1 ounce.
Powdered magnesium	4 drachms.
Amorphous phosphorus	10 grains.
Black antimony sulphide	20 ,,
Golden antimony sulphide	10 ,,

This powder deteriorates rapidly, owing to the phosphoric acid contained in the phosphorus. The acid may be removed by washing. On this occasion he had washed some phosphorus and dried it on filter paper, while he was preparing the other chemicals, sufficient to make 1½ pounds of the powder. The requisite weight of the dried phosphorus was placed in a brass sieve, and, while sifting this into the chlorate of potassium, it suddenly ignited, setting fire to the entire mixture. A violent explosion followed, throwing the sieve out of his hands, and the burning mixture over his face and clothing and on the floor. Fortunately he was able to quickly extinguish the flames on his clothing and the floor, but his hands and face were severely burned by the explosion. These accidents are typical of experiences that are only too common. Some photographers, for such reasons, abstain from the use of all explosive compounds, and prefer to depend for a flashlight on magnesium powder burned in a flame. W. M. Stine.

MOËSSARD'S APPARATUS FOR VIEWING STEREOSCOPIC PICTURES.

This invention enables persons assembled in a lecture-room or theatre to see from their places, with all the appearance of relief, ordinary stereoscopic pictures projected by a lantern or lanterns, on a white screen, or otherwise exhibited by known means, so that every one can see them at the same time instead of each one having to look at them separately, as when looking through an ordinary stereoscope.

For this purpose each person is provided with a special glass, either binocular or single, by looking through which the two pictures can be caused to blend as they do in a stereoscope, so giving the required effect.

An advantage of this means of viewing stereoscopic pictures is that they can be placed one above the other, instead of side by side, and can consequently be made of considerably greater length.

The special binocular or twin glasses for viewing the stereoscopic pictures are provided with two similar prisms, or with mirrors, for causing the pictures seen by the two eyes to blend together. The prisms, whose faces may be inclined at about 10° to each other, are held in tubes suitably connected by double rings. They are provided with means, such

as teeth, or slotted arms, for rotating them simultaneously in opposite directions through 90°, so as to suit for pictures placed side by side, and to cause the pictures to blend properly. If the pictures are placed one above the other, then one of the prisms requires to be turned upside down, or end for end, to facilitate which it may be mounted in a ring capable of turning in its place with a certain amount of friction through 180°.

If mirrors are employed instead of prisms, they are arranged in pairs in front of each eye, one of each pair being arranged to move or partially rotate.

The mirrors are so arranged that the image of the picture is seen after being doubly reflected. When the pictures are arranged side by side, the mirrors are upright, and one pair is inclined towards the other pair. When the pictures are superposed, the mirrors are inclined to the horizontal. In the latter case, a single long mirror may be employed in combination with two short movable ones to give the double reflection.

The special single glass is provided with only one pair of mirrors, and is intended to be applied to one eye only, so that, while this eye sees a virtual image of one of the two stereoscopic pictures, the naked eye sees the other picture directly, the two images blending and giving the stereoscopic effect.

To prevent the same eye seeing both the pictures, the glasses are provided with screens or stops for blocking out the picture which it is not desired to see, thereby confining the view of each eye to its respective picture, to avoid confusion.

When using mirrors, these may be made small enough only to reflect one picture, thus obviating the screens or stops.

The prisms give clear, bright images if their angle is sufficiently acute, but cannot be used very close to the screen or picture, whereas the mirrors are not open to this objection.

IMPROVEMENTS IN FLASH LAMPS.

Mr. A. A. Archer thus summarises the improvements he has patented in flash lamps for photographic purposes:—

It has been usual to charge the powder tube or basin of the lamp with the required amount of powder by hand after each flash, that is to say, after each exposure in the camera. This mode of charging is very inconvenient, particularly where a number of flash lamps are required, as, for instance, when it is required to light up a banqueting hall or large room.

Now, one object of my invention is to effect the charging of the powder tubes of any required number of lamps automatically and simultaneously by simply pressing a pneumatic ball or other air-propelling device. For this purpose I employ, in connexion with the powder tube of every lamp, a powder reservoir provided with a charging device which can be wound up or set, and which, when released by the action of a pneumatic ball, bellows, or the like, acts so as to deliver the required amount of powder into the tube through an opening in the side of same. The same pneumatic ball, bellows, or the like, can be connected with the charging devices of any number of tubes, so that the operator can charge the tubes of any number of lamps simultaneously from any convenient and prearranged part of the room. The charging device can be constructed in various ways. According to one construction, a cup or spoon is carried on the end of an arm, which can revolve on a horizontal axis in the powder reservoir. The device having been wound up, the pneumatic ball, when acted upon, releases it, it rotates once on its axis, and is then stopped by a catch. During the rotation the cup first scoops up powder from the reservoir and then delivers it into the tube, the opening of which may be fitted with a valve or slide that is opened and shut automatically; or a series of scoops or cups can be carried on an endless chain, like a dredger, and move to the extent of one scoop at every action; or the reservoir may be in the form of a hopper, the outlet of which is closed by a revolving wheel, having compartments that become successively filled from the hopper, and then discharge themselves into the powder tube; this revolving wheel will be wound up as above described, and revolve to the extent of one or more compartments whenever temporarily released by the action of the pneumatic ball.

Another object of the invention is to make the spirit lamp to be readily ignited from a small burner just before being required for use, so that it is not kept burning unnecessarily and proportionately consuming spirit. For this purpose I fit a small wick by the side of the main or large wick of the lamp, and I cover the main wick with a cap or other suitable cover, which prevents it from becoming ignited from the small wick. The small wick is ignited some time before the lamp is required for use. When the cap of the large wick is moved away, this wick becomes ignited from the small flame. The cap is preferably acted upon pneumatically by means of a bellows or other air-propelling device, which may be arranged so as to operate on the caps of any required number of lamps simultaneously, or the cap may be acted upon by a string or cord. The large wicks can be extinguished by returning the caps to position over same by means of the appliances that move them away from the wicks or by separate appliances. If gas be employed instead of spirit, there will be a small gas jet previously ignited and a bypass leading therefrom to the main burner, so that, when gas is turned on to the main burner, it becomes ignited from the small jet.

I preferably make the main burner, whether for burning spirit or gas, of oval or circular form, with two or other number of breaks in the circumference, for the purpose of admitting air for supporting combustion not only from the centre as usual, but also from the sides.

THE CROYDON CAMERA CLUB'S LANTERN NIGHT.

The Club's twenty-fifth public lantern show, held on Wednesday, the 25th ult., at Braithwaite Hall, was honoured by his Worship the Mayor of Croydon, who, with his usual untiring readiness to help forward all good movements, not only presided, but, in the interval, made a telling speech laudatory of the Club and its objects, in the course of which his Worship dealt upon various past advances in the improvements and applications of photography, and prophesied from the latter developments, such as shadowgraphy and cinematography, that an important and wonderful future was in store. Some timely advice of a humorous nature, addressed to the fairer portion of the audience, which caused much laughter, and a suggestion that the Club would find much fine subject-matter in the interior portions of the new municipal buildings, were, amongst other points, touched upon in the Mayor's address, which was punctuated by hearty applause by a densely crowded audience. The whole of the pictures (except six shadowgraphs, by Mr. Campbell Swinton) shown were the entire work of actual members of the Club, and as such afforded striking testimony to the talent and training of the members.

The series opened with an interesting set, illustrating the quaintness of the "two ancient cities" of Rye and Winchelsea, by the President of the Club (Mr. Hector Maclean), who accompanied the views with a pleasant ripple of anecdotal description. Several amongst the slides were warmly applauded, notably the little house which is the rural retreat of Miss Ellen Terry. Mr. A. W. Hirst followed with a splendid series of transparencies of the scenery and people of British India, from negatives taken by another member (Mr. Lucy) during a sojourn of several years. Mr. Hirst, who described the points of interest attached to the seventy or more pictures, is to be congratulated.

Next, Mr. Isaac, who managed the lantern, explained some thirty records of a holiday spent in Jersey. Many of these induced warm marks of approval, the snap-shots of the Corbière Rocks, with splashing waves and dripping streams of water, being particularly striking.

The popular Hon. Secretary did not belie his high reputation, but showed a number of Surrey and South Devon studies, which deserved, as they gained, high commendation. *Evening on the River Teign* was especially praiseworthy. Mr. J. T. Sandell's series of *The Palaces of our City Guilds* literally teemed with points of interest, and of surprising beauty of embellishment.

The President, who explained the two foregoing sets and all which followed, rightfully stated that a whole evening would not exhaust all that might well be said explanatory of the suggestive subject-matter of Mr. Sandell's slides, which formed another testimony to the advantage of a three-coated plate for the photography of interiors.

Mr. G. W. Jenkins contributed a score of well-executed illustrations of the picturesque portions of Maidstone and Seal, whilst Mr. Alfred Underhill showed a series characterised by great brilliancy and considerable charm. Some shadowgraphs by Mr. Campbell Swinton followed, and also two remarkable slides of a pair of scissors and some keys, which a member of the Club (Mr. Rogers) had obtained shadowgraphs of these had been enclosed in a package from which all light was excluded by means of six layers of various opaque substances. The strange fact is that no X rays were employed, but the package simply laid in a window for a few hours.

On March 23, Mr. W. Lamond Howie, F.C.S., lectured before the Lantern Society, his subject being what he called *The Scottish Alps*. This and the preceding demonstration of the New Photography, by Mr. Snowden Ward, have been the successes of the season; the interest excited was keen and sustained, the audiences crowding the meeting-room, at 20, Hanover-square, to its fullest capacity. The glen, river, lock, and mountain scenery of the western Highlands was illustrated by about 150 slides of the highest photographic merit. In appreciation of striking points of view, artistic grouping, and technique, Mr. Howie's photographs left nothing to be desired. The spring snows on Ben Nevis and other hills appeared on the screen with a quite startling fidelity to nature—peaks soared, precipices frowned, lakes mirrored their surrounding beauties, and over all were some wonderful effects of cloud and broken sunshine. The figure subjects were full of human nature—Highland lassies, peat-gatherers, fisher folk and cottagers, old smugglers, illicit still-keepers, and deer-stalkers introduced to the audience in Mr. Howie's own graphic and humorous style, increased the popular interest of the evening. The Highland castles and graves of the clans at Culloden added a touch of pathetic romance. The electric light, just presented to the Society by its Chairman, Mr. Vezey, was used in the lantern with the best results. Hearty thanks for the same were duly rendered to Mr. Vezey and to Mr. Howie for his in every way delightful exhibit and lecture.

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THE LANTERN RECORD.

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LANTERN MEMS.

ANIMATED lantern pictures are still the rage, for not only are there four different machines or projection apparatus being publicly exhibited at the present time in London, but these are being duplicated at the east and west ends, besides arrangements being in progress for provincial exhibitions. I had the opportunity, recently, of seeing Mr. Birt Acres' "Kineoptikon" at the hall in Piccadilly-circus (just at the junction of Shaftesbury-avenue), and the subjects shown were of a very effective nature, and point to a great future when the initial difficulties, inseparable from new inventions, are overcome.

* * * * *

IT seems to me, in this class of apparatus, the ultimate success will depend on the co-operation of the film-makers and the perfection of material forming the base, whether it be celluloid or something yet to be manufactured. The great light necessary for the projection of the present size of kinetoscope designs, to make them visible life size on the screen, or of sufficient size to be seen by a large audience, is such that it makes apparent the slightest blemish in either film or support, and consequently pinholes, scratches, and marks, obtrude themselves, and are particularly noticeable in the quick changes that have to take place to keep up the appearance of motion, or living photographs.

* * * * *

MR. BIRT ACRES, with a modesty very rare in these days of advertising, does not anywhere on his prospectus put his name, nor did he announce himself personally as the inventor, on the day I saw his exhibition, but contents himself with the following note at the end of the programme: "Our apparatus is an English invention, and was the very first shown in England, an exhibition having been given, with great success, at the Royal Photographic Society, early in January last. An entirely new series of pictures is now being prepared, and we shall frequently vary our programme."

* * * * *

I QUOTE this more as a text, for, from the results of each projection I have seen, I feel that it is a great pity, after once the plan of projecting the kinetoscope designs was found practical, that a much larger photograph was not arranged for, and the ultimate success of the invention will depend on the taking and projection of photographs of at least double the size of the present small photographs, for it is too much to expect to get perfection in detail in such a limited space.

CONSIDERING the material available, the results were remarkably good, particularly in such subjects as the *Breaking Waves of a Rough Sea at Dover; The Derby Day*, with its concourse of people on the course, the actual race, and the crowd after the race; *The Boxing Kangaroo*, and the *Arrest of a Pickpocket*. One could see from the various results shown that a great deal of the success of the pictures depended on the position available for taking the photographs, for, in those where the subjects could be to a certain extent "placed" or kept at a definite or fairly regular distance from the camera, the natural appearance was well maintained; while in others, such as the *Royal Review*, the exaggerated perspective had a most comical effect, the strides of the Emperor being in rapid succession Brobdingnagian and Liliputian; while, with the *Derby Day*, with the camera pointing nearly straight down the course, the horses, as they neared the end, and were thus close to the camera, were somewhat out of focus.

* * * * *

IT is, of course, easy to criticise, and I only allude to these little matters in the hope that some of the workers on machines for this class of work will see their way, not only to arrange for larger films being used, but induce some film-maker to produce them with the utmost care. That something has already been achieved, is amply testified by the reception accorded to the projections of the Kineoptikon and the Cinematograph daily, and, as I understand, in the modern patterns of the former instrument, it not only projects the subject, but can be used for photographing it, and is so constructed that the same plan, with probably a little modification, could be used for subjects of a larger size. Further development may be expected when a further supply of machines is made.

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THE aphengescope, or opaque lantern, figured largely the other evening at the Royal Institution in illustrating M. Lippmann's lecture on *Colour Photographs;* also at the Society of Arts last week, in illustrating a lecture on *Gems and Precious Stones*. Wherever reflected light has to be employed or opaque objects shown, some apparatus of this kind must be used. M. Lippmann's glass photographs, showing natural colours, are placed in the rays of light and inclined at such an angle that the incident rays are reflected. It may be that these photographs are very difficult to produce, but certainly the results are very beautiful, and the method of production, as explained, seems simplicity itself. Whether it is practical in ordinary workers' hands or not, time will show; but, if, as stated, all extra that is wanted is a mercurial backing to the photographic film arranged specially in an extra thick dark slide, and the plate coated with an extra substance of gelatine, then it does not seem that the obstacles should be insurmountable, commercially, or in an ordinary way, especially as, in sunlight, it is stated that three minutes' exposure was sufficient for photographing flowers and fruit.

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MR. IVES'S coloured photographs, as seen in the perfected photochromoscope, are very beautiful, and, when taken as stereograms,

most natural; but I am more concerned about the projection of colour photographs, and the apparatus for showing results on a screen to a large audience. His modified apparatus is very ingenious, one light only being used to illuminate the three films taken through different coloured screens (red, green, blue), and afterwards focussed and projected by objectives or front lenses, having prisms attached to their fronts or hoods capable of being rotated independently. The way the one set of rays is divided up into three sets, and made to evenly illuminate an area of the necessary size for the object, is particularly clever.

* * * * *

Imagine a pair of plates of transparent glass placed in the path of the rays at an angle of forty-five degrees to each other, and forming in section a V-shape, with the point turned to the right-hand subject. The light is both reflected by this glass, and also permitted to pass on to the central subject. The reflected rays travel at right angles on to a mirror placed parallel to the first side of the V, and at an angle of forty-five degrees to the incident ray, and are reflected at that angle, and so travel on parallel with the original ray, but in such a position that they illuminate the right-hand subject. The third or left-hand subject receives its illumination by reflected rays from the inside surface of the second transparent glass forming the V, a mirror being put in its path in line with the left-hand subject, and at an angle of forty-five degrees to the reflection. Thus all three subjects are illuminated, and it only remains to project the same on the screen.

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If objectives only were employed, these three subjects would appear side by side on the screen, but by putting a displacement prism in front of each, of such a degree that each subject can be made to overlap, then it is only a question of revolving the same to get coincidence, providing the subjects themselves are in perfect register. In order that there shall not be too much difficulty in getting superposition in public, the base of the central prism is fixed in such a position that the subject is only displaced upwards, then all that is necessary is to turn the prism in front of right-hand subject (counting from source of light), so as to displace it upwards and inwards to the left, while that in front of the left-hand subject is turned to displace upwards and inwards to the right. The various colour screens are placed behind the slide. It is very interesting to see the effect of placing one projection over the other, for it is not until the third is superposed that the beautiful and natural colours appear.

* * * * *

The fact that a camera has been designed and constructed to take these subjects for the photo-chromoscope at one operation, either as single pictures or stereograms, should, when the apparatus is placed on the market, lead to a large field of work among amateurs and others, for it is promised that very little more trouble is involved in the operation than that required for the production of original lantern slides. The lens for the camera consists of a single achromatic lens of large diameter in a sliding tube, and a series of two transparent and four silvered reflectors (somewhat as previously described) to divide the light into three separate rays so as to produce three subjects identical in size and perspective. The size of the plate used is $7 \times 5\frac{1}{2}$ inches.

* * * * *

Verily the age of "New Photography" has set in in earnest.

G. R. Baker.

MICRO-PHOTOGRAPHIC REDUCTIONS.

[London and Provincial Photographic Association.]

It occurred to me when I gave my name for a paper to be read before the Association that there was a subject at which I had worked some years ago, and which, so far as I can remember, had not been introduced to the notice of any Photographic Society, at any rate during recent years.

The title of this paper is self-explanatory, and treats of the minute photographic pictures mounted on the usual microscopic slips three inches long by one inch wide, and also to be found in fancy articles, such as thimbles, miniature opera glasses, knives, &c. These latter are very minute, that is, not exceeding, and often considerably less than, a square of $\frac{1}{16}$ inch side, and are complete as to their optical outfit, being mounted in contact by Canada balsam between the thin glass which bears them and a much thicker piece, the external surface of which is worked to such a convex curve as will focus the picture when the eye is placed close to it.

During the last few months there have been read before this Association excellent papers upon enlarging and copying, and it seems to me that the series may be fitly completed at the small end of the scale by this subject, which is, theoretically speaking, a reduction in the camera optically the same as the operation of reducing an ordinary negative to lantern size, that is, there is a source of light, condenser, negative, lens, and sensitive surface.

But, the theory being granted, the practice is so different, that a brief description of the apparatus with which I hope to successfully produce one of these small images before you is desirable, and, in passing, I may say that to-night I shall not attempt to go to the extreme minuteness which I have mentioned, but will content myself with a reduction of about thirty diameters, which will give, with the size of negative employed, an image of about $\frac{3}{32}$ inch side.

Taking the apparatus as it stands on the board, there is:—

1. The source of light. This consists of a gas Argand lamp on a low stand, but the usual glass chimney is replaced with one of thin copper, the joint of which is folded, not soldered, on account of the heat. This chimney has two openings, one opposite to the condenser, glazed with a small circular window, over which can be swung a ruby glass "shade," the object of which will be seen later on. This is the exposing light. Opposite to it is another opening, glazed with ruby glass, curved to the copper and cut from a commercial chimney; this is the developing light.

2. The condenser consists of an equi-convex lens four and a quarter inches in diameter, being one glass of a lantern condenser of the meniscus and double-convex form. This is held in a wooden upright at the correct height, so as to line with the source of light; the upright also carries a shelf and turn buckle to hold a negative three and a quarter inches high, also a piece of ground glass for focussing.

3. We come to a 5×4 parallel bellows camera, intact but with its focussing screen laid back out of the way; it is packed to height on a wooden frame, which slides in graduated guides on the board. Its front carries a special fitting, which it will be necessary to describe in some detail, and I may here remark that an upright board representing the front might only have been used, but the camera was to hand, and answered the purpose of keeping off stray light during exposure, giving as well a means of exact centering adjustment by the cross front. The fitting just alluded to answers the following purposes: lens-holder, rough and fine focus adjustment, and plate-holder. The inner tube slides into the body of the fitting, and carries at its inner end the standard "Society" screw thread, into which can be screwed all modern microscope objectives. This, with a one-inch objective attached, is pushed into approximate focus, and the final adjustment is made by the micrometer screw and index seen on the top. As the screw has forty-eight threads per inch, and the index is divided into twenty-five parts, it follows that one division will give one twelve-hundredth of an inch movement to the plate on the stage. The process used being wet collodion, it is necessary to provide four silver studs to come into contact with the plate, these being analogous to the silver-wire corners in a wet-plate camera slide. Two projecting screws at the requisite height, upon which to rest the plate, and a spring to hold it against the studs, complete the stage.

No dark slide, in the ordinary sense, is necessary, as collodion is not sensitive enough to be affected by the dull artificial light of the room, a small piece of velvet or cloth thrown over it during exposure being sufficient protection.

Naturally, the first operation, after setting up the parts, will be focussing the image, and I may observe that this is a matter of some little delicacy, the focus running away rather quickly, as may be seen by the six trial exposures on one slip (each differing by one division of the micrometer), which I will put under the microscope, and it will then be seen that even this small error is quite appreciable, the subject being the *Ten Commandments* in print.

As to this question of focussing, I have tried several methods, viz., examination of the reduced image by a strong Ramsden eyepiece adjusted to the thickness of the plain glass slip, as when examining an ordinary camera image; also examination through a microscopic objective fixed behind the stage, and adjusted to its focal plane.

Neither of these methods was satisfactory to me, and I then utilised the principle of focussing the enlarged image of an object (clamped upon the stage) at the longer conjugate focus, the object necessarily occupying the same position that the collodion film will eventually take. Having removed the condenser, put a piece of

ground glass in the negative-holder, and a mounted microscopic object on the stage, you can, by means of the milled head, obtain a sharp, enlarged image, the lamp being removed to the other end behind the stage.

This proving satisfactory, you may be sure that, if the negative be made to take the place of the object, correct visual focus will result. Some objectives, however, require slight correction for the chemical focus, which can only be ascertained experimentally; the one-inch which I am using to-night, however, is fairly correct in this respect.

The wet-collodion process is chosen for these pictures on account of the extreme fineness of the deposit, more especially when developed with pyrogallic acid, which developer will be used to-night instead of iron. I thought, perhaps, that dry collodion might do, but I found the particles much coarser and not all the same size, so I did not proceed further in this direction.

Taking all things into consideration, wet-collodion is probably the best process, inasmuch as the several operations of coating, sensitising, developing, fixing, drying, and mounting can be gone through very quickly, and with greater certainty than obtains with other processes.

Respecting the apparatus before you, I may add that, with the exception of camera and condenser, all is home-made, from the first materials at hand, and I also wish to say that the idea of the focussing and stage arrangement was derived from a view of Highley's camera, illustrated at page 159 of Hogg's *Microscope*, 1883 edition.

It is almost needless to say that the fitting can equally well be used for the reverse process of photo-micrography with low powers, the only other condition being that the space between the objective and the sensitive plate at the longer conjugate must be in darkness, as in an ordinary camera, or the room itself furnished with non-actinic light.

With these few remarks I will proceed with the demonstration.

G. W. Atkins.

COMPLEMENTARY COLOUR STEREOSCOPY.

The successful demonstration recently given by Mr. T. E. Freshwater F.R.P.S., upon this method, as applied to screen pictures, before the members of the London and Provincial Photographic Association, raises considerations of some interest in regard to the origin, progress, and further development of the invention.

Without questioning for one moment the *bona fides* of Mr. Freshwater in claiming that his demonstration is the first practical exhibition of the method yet shown to an audience in this country, I may say at once that the claim cannot be admitted, and that, when he mentions the device as *his* system, he may be regarded as a "true," but scarcely as the "first," inventor.

So far as I am aware, the earliest published notices of the method refer to my demonstrations of it in 1885, when I showed it practically to some of the members of the Manchester Photographic Society.

In *Knowledge*, of July 24, 1885, the following succinct account of the invention appeared:—

"Mr. W. E. Crowther, of the Manchester Technical School, has devised a scientific arrangement for the production of stereoscopic effects in pictures drawn upon the screen by the lantern. The method is as follows: Two lanterns are used, each of which projects one of the two corresponding stereoscopic transparencies upon the screen, so that both fall together upon the same field. The light from the lanterns, however, is not white, but of any two complementary colours, as red and bluish-green. The spectators wear non-magnifying spectacles, fitted with glasses of the same tints as those used in the lantern, and the result is that each individual sees one picture only with each eye, viz., the picture thrown from the green lantern is alone seen by the eye wearing the green glass, whilst the eye shielded by red glass sees only the picture thrown from the red lantern. In this way each eye is affected only by its appropriate view, whilst the brain, receiving simultaneously the two views in complementary colours, combines them into a stereoscopic light and shade representation, which possesses some peculiar properties of lustre.

"The combined picture, as viewed by the naked eye, is, for the most part, white, from the union of the red and green lights upon the screen. The stereoscopic differences of the pictures, or overlapping portions only are chromatic. By slowly turning the lanterns so as to shift the screen pictures slightly to the wrong side of each other, so that the optic axes of the spectator may intersect in front of the screen, the picture appears to advance and become suspended in the air before the screen."

The new method was fully noticed in the Manchester press, and in scientific journals, both English and Continental, and was also recorded amongst the year's progress by one or more of the photographic annuals. Your contemporary, *Photography*, of October 23, 1890, mentions a demonstration of the arrangement by M. Schrober, of Antwerp, before the Antwerp Photographic Society, and I could point to other publications of the idea sufficient in the aggregate to constitute almost a bibliography of the subject.

It is therefore abundantly clear that, whatever may become of my claim to priority, that of Mr. Freshwater cannot stand.

Although since 1885 the invention has perennially cropped up in various societies and journals as a new thing, little variation and no progress have been observable in the arrangements and in the degree of success attained. The cardinal defect of the exhibition for popular purposes is the serious loss of light which results from the employment of coloured screens in the lantern, which renders the picture, though perfectly stereoscopic, much less pleasing than an ordinary well-lighted projection. The apparent impossibility of overcoming this objection seems to have induced the various experimenters to abandon the further prosecution of the idea, worthy, as it seems to be, of continued attention on the part of lanternists. There are, however, several possibilities of progress which may be mentioned. It would appear that the colouring of the light has always been effected, in the way most convenient to the operator, by the insertion of slips of coloured glass with the slides, thus interposing a large area of light-stopping material in the path of the rays, whereas, if a small screen were used within the objective tube, at or near the internal focus, much less light would be lost, and yet the colouration of the rays would be fully accomplished.

With regard to the provision of the necessary coloured eyeshields, a cheaply manufactured article of cardboard and coloured gelatine is sufficient, whilst spectators who have any difficulty in fitting and wearing spectacles or eyeshields may prefer the use of opera glasses fitted with coloured glass screens.

It is much to be hoped that this interesting field of invention may not be allowed to lie fallow for want of workers, especially as the ultimate goal of lantern projection is becoming clear, viz., the representation in full stereoscopic relief of moving objects in their natural colours. It is undeniable that some recent advances suggest the possibility of realising this ideal.

W. E. Crowther.

ACETYLENE GAS.

[Photographic Times.]

It is only within a very few years that electricity has become an important source of light for photographic operations. The development of this light has been marvellous; its adoption followed immediately upon the evidence of its practicability. It has been a great boon to those photographers who have been in a position to command its services. The readiness with which it was taken up shows how great is the need of some artificial source of light in many kinds of photographic work.

Electricity, however, is only to a limited extent available, and at best it is somewhat expensive. It may find a rival in efficiency and economy in the brilliant light of acetylene gas. At present, acetylene gas is by no means a cheap product; but improvements in the manufacture of the calcium carbide, from which the gas is produced, are to be expected. Even now the cost of the carbide should not be more than $100 per ton, from which about 10,000 cubic feet of acetylene gas should be obtained, making the cost of the gas $10 per thousand feet. But the illuminating power of this gas is much greater than that of ordinary gas. Discarding the extravagant claims of parties directly interested in the sale of acetylene securities (who have even made the astonishing assertion that 1000 feet of acetylene gas is equal to 30,000 feet of common illuminating gas for house lighting), we may fairly assume, that acetylene properly burned, will yield ten fold more light than good illuminating gas. Hence, an equivalent of 1000 cubic feet of illuminating gas would be furnished by 100 feet of acetylene, at a cost of $1·00. This is on the presumption that the carbide is sold for 5 cents a pound. In small quantities it costs considerably more, the lowest quotation that has come to me being 18 cents a pound, in 100 pound lots. Even at this price, however, the acetylene light will have numerous applications in a small way, when a thoroughly practical, convenient, and economical generator for the gas is on the market.

Calcium carbide is a heavy crystalline compound, dark grey in colour, with a specific gravity of about 2·2. It absorbs moisture from the air with avidity, setting free acetylene gas, which is recognised by its characteristic odour. In contact with water it is instantly decomposed, acetylene gas being set free with tumultuous bubbling, a deposit of lime

and carbonaceous matter remaining in the liquid. The course of decomposition may be simply represented with chemical symbols as follows:—

$$\underset{\text{Calcium carbide.}}{CaC_2} + \underset{\text{Water}}{H_2O} = \underset{\text{Lime}}{CaO} + \underset{\text{Acetylene.}}{C_2H_2}.$$

From this it will be inferred that the generation of acetylene from calcium carbide is a very simple operation, which can be effected with the crudest form of apparatus. This is quite true. I have many times exhibited the acetylene light to friends by merely dropping a lump of the carbide into water, in a bottle provided with a cork and a suitable burner. But it will be found, in practice, that it is not quite such a simple matter to generate and deliver the gas under suitable conditions of flow and pressure, without the use of some form of gas-holder and regulator.

In this connexion, mention should be made of the generator, manufactured in different sizes by Messrs. Fuller, Walmsley, & Co., of this city, which has been on exhibition at several places, and warmly commended. It is simple and practical; but, since it will, doubtless, be described in these columns by others, I will not take up the space with any other words concerning it.

There is, however, another form of generator, not yet on the market, which, in my opinion, possesses certain points of superiority over this one, especially in the matter of compactness, lightness, and control over the generation of gas, but the inventors are not yet ready to make public the details of construction.

Another method of utilising acetylene gas is to furnish it to consumers in the form of liquid acetylene. It is proposed to condense the gas to a liquid, under a pressure of about fifty atmospheres, in cylinders, which have only to be attached to the gas pipes of a dwelling, very much as carbonic acid gas is furnished to drug stores. This also is a very simple matter, on paper; but there are practical difficulties which, so far as I am aware, have not yet been surmounted. There is a tremendous difference between a pressure of fifty atmospheres in a cylinder and the pressure required in the pipes to burn the gas, so that the mechanism for reducing the pressure and automatically regulating the flow of gas must be very nicely adjusted. Liquid acetylene may yet come into general use in the manner proposed, but the writer is sceptical concerning this matter, not only for the reason indicated above, but for another reason. Calcium carbide itself is not only much more manageable as a source of the gas, but it is inevitably cheaper. On the one hand, we have the cost of compressing the gas, not a serious matter, it is true, since the pressure can be produced by the generation of the gas itself; but, in addition, there is the cost of cylinders and fittings, needle valves, regulators, &c., transportation charges back and forth, and the time required to make proper connexions with the pipes and to ensure correct adjustment of flow. On the other hand, the carbide has only to be put into the generator, and can be furnished in sealed tins at a nominal cost for packing. Further than this, a cubic foot of liquid acetylene, exclusive of the heavy containing vessel, weighs about 28·15 pounds. This weight of gas, at ordinary conditions of temperature and pressure, occupies a volume of 387·5 cubic feet, but a cubic foot of calcium carbide, sp. gr. 2·2, would yield almost double that volume of gas. The advantages are, therefore, decidedly in favour of the use of the carbide directly.

I have gone thus fully into the matter of generating the gas for the reason that I fully believe the subject is certain to become of considerable interest to photographers and others, and there is so much false information circulated concerning acetylene, industriously disseminated by interested parties, that it is well to consider carefully all statements that are made.

As to the relative merits of the acetylene light compared with other sources of light, I regret to say that I am not yet able to write as specifically as I would wish. From such data as are at hand, however, it would seem that the photographic action of the light is sufficient to warrant the assumption that it will prove an effective substitute for the electric light for use in gallery work, for copying and enlarging, and wherever artificial light is required. It will certainly prove a great boon to photographers in small towns, where electricity cannot be obtained, and perhaps it will be found to possess certain advantages over electricity in the way of ready adjustment and even diffusion for portraiture, which will be quickly appreciated by operators.

The flashlight has given a great impetus to home photography, and the professional photographer is often called upon to do outside work in houses and machine shops which would be impossible but for the magnesium powder. With acetylene, however, the same work can often be done in a still more satisfactory manner. The small generator referred to in this article, of a capacity sufficient to afford ample illumination for the purpose, can be readily carried about and the light distributed in a manner to ensure the most effective results.

Among other important applications of the light may be mentioned an ingenious lamp for bicycles, which is about to be placed on the market by a company in this city. More within our immediate province, however, is the application to lantern exhibitions. Here is a truly great field for it. Much more convenient than the oxyhydrogen light, with the heavy cylinders which must be frequently filled, the brilliancy of the acetylene light is entirely satisfactory, even with the burners at present used, and these, I am convinced, are not by any means of the best form for the purpose.

For microscopical photography, as well as for ordinary observation with the microscope, the light is very superior indeed, a small and exceedingly luminous flame being available with comparatively little heat.

The light is not only intense, but it is also very white. Colours are seen by it in almost their daylight shades, although it is said that a slight lavender tinge of the light itself somewhat modifies the shade of certain colours. Owing to the relatively small quantity of gas consumed for any stated illumination, as compared with ordinary gas, the heat produced is very much less, the contamination of the air is reduced to a *minimum*, and there should be no products due to imperfect combustion. With all these valuable qualities in its favour, one can scarcely doubt that the acetylene light is destined to assume very great importance in the immediate future.

ROMYN HITCHCOCK.

INCANDESCENT MANTLES.

THE observations of Mr. Justice Wills in giving judgment in the actions brought by the Incandescent Gaslight Company against the Mare Incandescent Gaslight System and the Sunlight Gas Lamp Company, are of so much interest in connexion with the subject that we here reproduce them. The learned Judge said: The plaintiffs complained of several infringements by defendants of letters patent granted to Dr. Welsbach for the manufacture of illuminant appliances for gas and other burners. The defendants denied that what they proposed to do constituted an infringement of the patent, which they also attacked on nearly all possible grounds. It had long been known that certain substances, such as lime, magnesium, and zirconium, when heated with the flame of mixed coal gas and air, would produce brilliant incandescence, but it was quite safe to say that Dr. Welsbach discovered the practicable and simple method of so treating oxides that it was possible to use them in burners. He also discovered a class of substances known by chemists as rare earths, which, when blended with zirconium, would afford the necessary illumination. Since the date of the Welsbach patent a great industry in the production of the salts of rare metals and substances had sprung up. It was important to ascertain what was the true meaning of the specification. The patentee claimed that a combination of various essential elements used in the process which he described for the manufacture of a hood or mantle composed of fabric dipped in a solution of oxides produced light by incandescence, and it was for this invention that protection was asked. If the process which the defendants held out that they were going to use was substantially the process described in the plaintiffs' specification, they were liable in this action; but, if not, they were entitled to his judgment.

As to the objections raised by the defendants, it was said that the invention was not the proper subject for a patent, having regard to the state of common knowledge at the time, that it was not new or useful, and that the specification itself was too vague, and that the proportion of oxides was misleading that would not produce a good result. In his opinion the first objection was singularly ill-founded. The invention of Dr. Welsbach, with the improvements following upon it, had undoubtedly produced a great new industry in England in the extraction, for the purpose of the manufacture of these caps and mantles, of oxides, salts and rare metals, and the globe had been ransacked for new sources of supply. In the words of Professor Dewar the invention had accomplished what had been attempted before with want of success, and had, for the first time, brought within the range of practical manufacture the production of a brilliant light by incandescence within an ordinary gas flame. The evidence on this point seemed to be absolutely conclusive. He had carefully examined the various specifications which were alleged by the defendants to be anticipations of that of Dr. Welsbach, but they did not bear out the contention that his particular patent was not novel or had been anticipated. Again, there appeared to him to be no ground whatever for the attack on the patent on the score of want of knowledge, for the field upon which Dr. Welsbach entered was hitherto untrodden or marked by absolute failure. The objection that the invention was useless was a singularly hopeless contention. A further objection was raised that the specification was too vague, but he was of opinion that any one could make a Welsbach mantle by following the specification if he saw that the materials used were pure. This ground of objection to the validity of the patent also completely failed.

Passing to the very important question of the infringement threatened by the defendants, he said there was no doubt as to what the defendants intended to do. They proposed to make a plume consisting of a number of threads tied on to a platinum wire and arranged so as to form a sort of

fringe, all the threads of which were brought very closely together, but allowed to separate as they needed. The plume was dipped into a solution of sulphate of magnesium 20 per cent., sulphate of erbium 40 per cent., and sulphate of zirconium 40 per cent. There was the omission of lanthanum, which was used by the plaintiffs, but that omission would not obviate a serious infringement of the plaintiffs' process. The defendants said that their plume was not a fabric at all. He failed to understand why it was not. It was true it was something different to that of the plaintiffs in some respects, but Dr. Welsbach said that his fabric might be varied so as to suit different burners. The question was, whether what was proposed to be done by the defendants took from the patentee the substance of his invention. So far as the result was concerned, what was the character of Dr. Welsbach's patent? The result was something entirely new, and deserved the description of the pioneer invention. Dr. Welsbach discovered for the first time a method by which a skeleton, frail but durable, of the resistant earth oxides mentioned by him could be obtained, and which was the means of obtaining light by incandescence which would surpass in economy the best method known of obtaining illumination from gas. He had no hesitation in saying that the defendants proposed to take the substance of the Welsbach process. The substance of that patent, as described in the specification, was, in his opinion, appropriated by what defendants proposed to do. He therefore gave judgment against the defendants upon all the issues, with costs, and granted the injunction prayed for by the plaintiffs. He also certified that the plaintiffs' patent was valid.

In the case against the Sunlight Incandescent Gas Lamp Company his Lordship said the defendants had been formed to work a patent granted to one, Dellwick, for improvements in incandescent lighting. Dellwick's patent did not impress him favourably. Indeed, parts of it he was justified in calling nonsense, and he doubted whether this rubbish had been inserted for any other purpose than that of trying to make it look unlike the Welsbach process. The learned Judge then proceeded to describe the process of manufacturing the mantles adopted by the plaintiffs and the defendants, and said that he felt that defendants had taken a valuable process from Dr. Welsbach without giving any remuneration to him. The defendants had not taken the substance of the Welsbach invention, and therefore he gave judgment for them in the matter of infringement. He, however, found for the plaintiffs on the issue as to the validity of their patent, and reserved the question of costs.

PROFESSOR DEWAR ON ACETYLENE.

Professor Dewar devoted most of his last lecture at the Royal Institution to this gas, which, as he previously explained, is now obtained in large quantities by the simple expedient of dropping carbide of calcium into water. Of course you have first to get your carbide from the electric furnace. At present, by using the power of Niagara Falls, the carbide can be had for 5*l.* per ton. One pound of it gives off five cubic feet of gas, but, as this gas is eight times more brilliant in illuminating power than that from common coal, the ultimate cost of the light works out very favourably. But it is a very explosive gas, "going off" at a much lower ignition point than coal gas when mixed with a little air, and, what is more remarkable, it will often explode on its own account (without air), if submitted to shock or concussion. All these faults are due to what the physicist would call its strange "endothermic" properties. Still, with care, it can be used safely enough. But it has a cheerful habit of forming explosive compounds with any brass, copper, or silver that comes in its way, which is again awkward. It is better, therefore, to turn aside from these dangerous eccentricities to other characteristics notable in this gas, which are of more interest to science. One of these is, that if you freeze it at eighty-three degrees of frost (Centigrade scale), it turns straight from gas into a sort of paraffin wax, without troubling to pass through the intermediary liquid stage, but the solid can be subsequently liquified by heating under pressure. In all this we must not forget that all the credit belongs to the electric furnace, which has enabled us for the first time to complete the synthesis of the organic chemical compounds. From these carbides we can get benzine (and therefore all the aniline dyes), and even crude petroleum; acetylene combines directly with nitrogen in the presence of an electric discharge, and gives prussic acid. From this we can easily get cyanides, which, treated red-hot with steam, yield ammonia. In fact, the chemist sees no end to the sphere of usefulness of the electric furnace, which may even solve the problem of making nitrogenous manures.

COMPOSITION AND COLOUR; OR, PICTORIAL POSSIBILITIES IN LANTERN SLIDES.*

The photographer need not feel beneath Raphael, if he knows and applies his art as well. After all, it is the doing rather than the deed that makes us great.

Everything, both animate and inanimate, has its characteristic expression. Did you ever catch a building looking at you? I have often been watched in the most inquisitive manner by some old farm-house, until I could fancy it possessed personality, and was making comments on all passers by. And again, at night, I have been glared at by a house in a highly unpleasant and cat-like manner.

Repose, majestic calm, is the great characteristic of the architecture of ancient Egypt and Greece. The predominance of horizontal lines is marked in all their temple constructions. The race with the oblique eyes carries something of a smile into the upcurved roofs of their temples and pagodas. And we find that the gently sloping hill sides make the term "smiling valley" entirely appropriate. Gothic architecture, with its steep-pitched roof lines, becomes grave and solemn, and the grandeur of the mountain peaks, rising above the solemn pines, is thoroughly removed from levity. The sense of sublimity is aroused as the steeps approach the perpendicular, and we begin to feel our insignificance when hemmed in between rocky walls thousands of feet in height. The awe-inspiring effect of many of Doré's weird compositions is due to the pushing of this principle to an ideal exaggeration.

When we behold the "beetling crags" and "frowning battlements" overhanging our heads, we realise an impression of savageness, and know that nature has her terrible moods; that her bosom bears the potency of destruction, as well as blessing, for her children; and that her unchained elemental forces may, in a few brief moments, consume the fairest works of man.

A lecture without some allusion to Japan is not to be taken patiently to-day. Her ancient religion may be dying, but her beautiful temples still stand and attract pilgrims from the shores of the west. Her ancient arts are said to be decaying before the commercial spirit of those same shores. In the smoke of modern warfare, her charming old superstitions have probably vanished. We, who love her tea and her bric-à-brac, cannot help a sigh for the ghosts that are no more. Photographers are sometimes troubled with "ghosts." There may be a nebulous light spot in a picture caused by an imperfect lens, or a reflection, which is technically known as a "ghost." But more troublesome is the belief some of the fraternity fondly cherish, that the camera cannot lie. Another ghost, which sometimes haunts the artist is the idea that subjects worthy his brush or his camera can only be found in far distant lands. When thus possessed, everything at home becomes "flat, stale, and unprofitable," and one is profoundly unhappy and envious of those who can voyage to some Asiatic seaport, and at the hazard of famine, and fever, and massacre, journey painfully across some burning desert, and capture a band of Bedouins, dirt and all.

But we should not therefore imagine that we are without fields just as good for our best efforts. We dwellers in the wilds of Brooklyn find the voyage across the East River shorter, safer, and less expensive than the trip to the Orient; and there is no region on the planet more crowded with interest of every conceivable sort than the coasts and lands of "Gotham." Being the most cosmopolitan huddle in the world, if one wishes a foreign flavour, rich with all the tints, and redolent of all the spices and other odours of the old world, let him step into such a spot as the lamented Mulberry Bend.

Not long ago, an art critic, in his smart strictures upon the pictures in one of the Fall Exhibitions, denounced the subjects painted by a man, the least of whose works is a thing worthy of reverential study, as "insolently commonplace." Dismissing the commonplace insolence of such remarks as rather an impious criticism on the Creator, who permits the same glorious sunlight, the same harmonies of colour, to play alike on palace and potato field, we may well consider whether the revelation of the beauty of familiar things is not one of the highest of artistic missions. This is one of the functions peculiarly within the province of photography.

We go heedlessly to and from our business, absorbed in schemes or reading the delectable crimes and scandals in the daily papers, never seeing the picturesqueness of the old mill dam, never realising the wonderful growth going on among the green things, never feeling the delicate contrasts and blendings of soft and rough texture and warm and cool tints, as we whirl past on the rail. Then, as we hustle along the street, we notice nought of joyous young life, still untouched by care, but hurry on, intent only on preserving our anatomy from the street cars and getting as quickly as possible to our daily grind. But, if art is our vocation, we ought always to be on the alert for the bits and scraps by the wayside.

However, every one to his taste, and, if one's bent is towards the far-away and romantic, let him, by all means, follow the wedding journey of Lalla Rookh until it brings him to the palace of the Prince.

We often hear the expression "unnatural colour." There is no such thing as an unnatural colour. All conceivable tints exist in the solar beam, ready to be selected and reflected from the myriad surfaces around

* Continued from page 30.

us, each of which is really a mirror for certain rays and a transmitter or extinguisher of other rays. It cannot be said that any object is always of one particular hue. Colour varies from hour to hour, under the influence of the cool light of dawn, the glare of noon, the grey of cloud, the flush of eve, the pallid splendour of moonlight.

The atmosphere, that wonderful ocean at whose bottom we crawl about, the most indispensable of all the requisites of life, the most abundant, the only one which is free, and the one which, apparently, is the least valued or considered, this life-giving medium of communication between the heavens and the earth, is also the great composer of nature's colour harmonies. The atmosphere takes the crude and discordant tints, picked out from the sunlight by earth, rocks, water, vegetation, and tones them here, softens them by reflection there, hangs transparent veils through vistas and over distances, and in every way acts the part of the most consummate painter. Without this magical influence, so familiar that we rarely stop to consider its wonderful beauty, nature would present but the baldest and harshest aspect. With a blinding burst, the first rays of morning would shoot across the horizon, succeeding inky blackness, without one instant of mediating twilight. The landscape would be discovered in a few hard tints of red and yellow with wastes of leaden grey earth and Stygian waters lighted only by a metallic reflection of the fiery orb from the waveless surface. The sky would be always black, every distance would show the same sharp-edged contrasts. Retiring to a shade, to escape blistering on one side while freezing on the other, would be going into night again. A world without half-tones! The two ends of the scale only—no clouds, no mist, no delicate blue or purple grey distance, no verdure, no fresh water, no breeze—what a place of horror the planet would become without this atmosphere!

It is just a lack of appreciation of what the atmosphere is and does that makes so many pictures unnatural and unpleasant in effect. All colours are natural. The same object may, under various circumstances, reflect every possible hue. It is in the painter's combination that the unnatural so often results. Could one paint with vibrating ether and living flame, he might think of successfully imitating nature. As it is, the painter can only translate nature many degrees lower in key, with pigments which are but ashes, the oxides or cinders of earth's elements. Small wonder that he sometimes makes *mésalliances* of colour, putting together what God has kept asunder.

There is a recent movement in painting which calls itself Impressionism. It claims to render truths of atmosphere and vibratory effects of light as nothing else has ever done. I think it does. And it has occurred to me as a good way (while the fashion lasts) in which to utilise slides spoiled from lack of focus or other accident. The impressionist painter of this school analyses the colour rays, and counts drawing, depth, harmony, beauty, and everything else well lost if only vibration (by which he seems to mean doing violence to the optic nerve) is secured. He tells you that his pictures are painted to produce this magical effect at a certain distance, at which "they come together." But, setting aside faddism, there is a true impressionism which aims at the grand truth instead of the little, and which is of the highest importance for artists of all ranks to understand. Turner was, in many ways, the first true impressionist, as distinguished from the mere plodder over details in landscape; he was the first painter to thoroughly render all atmospheric phenomena.

In the morning of life we set out fresh and innocent, bravely riding upon ignorance. We accept the smaller truths that the rose is red, the grass green, &c. The larger truths of atmosphere and space and the mutual relations of things are beyond us, as we play with our brightly tinted toys. We have not yet learned to appreciate the promise of the first bright days of spring. An hour of time is beyond comprehension. Life goes as a sparkling stream flowing among the gaily tinted banks of a royal park. A few days pass, and we have forgotten that the grass was not always green, and the calves were not always grazing and gambolling. A gaudy picture book pleases us far more than the works of genius. A passing shower, a trifling grief annihilates us. We have as yet no sense of proportion, no deductions from past experience to help us over into the future. We live only in a moment, we see only a point at a time.

So it is at the outset of the study of art. It requires time, and exercise, and the guidance of the wisdom of the past to open our eyes and enable us to see the general, the broad truth, instead of the special, the isolated fact, the merely local colour, the one detail at a time.

Considered as an attempt to instruct, my fragmentary essay this evening will be of little value. I have touched but a few of the points included in my subject, leaving unmentioned many of equal importance. My aim has been to suggest to my photographic friends, if any of them have not before realised it, the great value of art principles in their work, and I particularly recommend the study of antique sculpture for developing appreciation of form, and the great masters of painting, the Dutch, the English, and modern French, for landscape, and the whole range of figure painters from the early fifteenth century to the present, and especially Rembrandt and Velasquez, the two greatest masters of opposite styles, for ideas in portraiture.

Life is short and art is long Whatever the artist does, he should do with sincerity. Whether professional or amateur, he should respect his art too much to consider it a mere pastime, and, whether he can follow its service far or not, let him be faithful to that service, and he will help the material world in its progress towards the ideal.

I wish to see the greatest possible art value put into stereopticon work. In our schools the idea is carried into practice that every exercise, in every branch, should be a lesson in language. I will make the plea that every lecture illustrated by lantern pictures should also be a lesson in art.

The first manifestation of the spirit of God in the material world was the creation of light. We are told that the rainbow, the revelation of the seven colour elements of light, was set in the heavens as a sign of divine care for man's development. The growth of the ages, the generosity of the Almighty, is behind the arts employing the sunbeam and its seven children.

Let us, then, realise the lofty mission of our work, and remember not to lose sight of the spirit in the eternal form, "the letter which killeth," but to seek and express the broad, the grand truths of nature in all art.

A. G. Marshall.

TELE-PHOTOGRAPHY ILLUSTRATED WITH COLOURED LANTERN SLIDES.

[Society of Amateur Photographers of New York.]

There was a special lantern exhibition on Friday evening, February 7, the subject being "Tele-photography, illustrated with coloured lantern slides," by Dr. D. L. Elmendorf. The tele-photo lens has not been a great success in the hands of ordinary amateurs, but Dr. Elmendorf is not an ordinary amateur, as all who have seen his coloured pictures and heard him describe them will testify. He did not say much about the technical side of long-distance photography on the evening in question, preferring, with his usual tact, to avoid tiring his hearers with purely scientific matters, and letting his pictures do most of the talking, which they did most effectively. He did say, however, that his negatives were taken in a small camera, having a long extension, with devices, besides the ordinary tripod, for keeping it perfectly rigid. The lenses were the ordinary rapid rectilinear of about seven inches focus, a long-distance lens of fourteen inches focus, and in addition a Dallmeyer tele-photo lens, of moderate amplification, the equivalent focal length of which was not stated. Most of the slides of purely picturesque value were taken with the two smaller lenses, as a matter of course; for, where details of very distant objects are taken with a telescope arranged as a photographic objective, the rays of light entering the lens being almost absolutely parallel, the resulting projection becomes a geometrical delineation, utterly wanting in the suggestion of the third dimension necessary to show solidity—it shows height and breadth, but not thickness. Dr. Elmendorf's slides, however, were so admirably chosen and so exquisitely coloured, that much of the flatness, so characteristic usually of telescopic views, was avoided. Indeed, many of his long-distance photographs were of architectural details, lying pretty much in one plane, and therefore faithful renderings of the subjects. Europe furnished most of the material for the entertainment, and, as the doctor is an accomplished and observant traveller, he kept up a running chat, as the pictures came on the screen, that was entertaining and instructive and full of variety. Perhaps the most popular of the series were the illustrations of Venice, and, of these, the copies of the doorways of St. Mark's Basilica and the wonderful mosaic paintings. The latter were given on a larger scale than we have ever seen here, and the colouring seemed to be faithful and harmonious. Dr. Elmendorf stated, however, that they required some further tinting, and that the basis of his lantern-slide colouring was water-colour sketches made by himself on the spot. From this it would seem as if Dr. Elmendorf's success in producing lantern slides almost in the colours of nature results not so much from manipulative skill and discretion and taste in the use of transparent pigments as the disposition to take infinite pains in one endowed with no small amount of artistic talent. The exhibition was viewed with pleasure by a large audience, and one of our members, in his enthusiasm, was moved to purchase the only tele-photo lens offered for sale at the February auction, and he intends to go forth and do likewise.

IMPROVEMENTS IN FLASHLIGHT APPARATUS.

Herr Boal describes his improvements as follows:—

"On each side of a bottom plate two lugs are arranged, into which are screwed two parallel bars of iron or the like. Movably attached to these

bars is a casing provided with a clockwork, which casing is pressed by means of two spiral springs away from the cartridge or the like to be fired.

"This clockwork causes a disc which is placed on the clock casing, to rotate, said disc being provided with a cylindrical periphery. The clockwork is wound up by means of a key, and the disc is kept in its place by a brake lever which is fastened on to the bottom plate, and by means of a nose engages with a notch in a circular plate placed underneath the aforesaid disc. The disengaging of the brake is accomplished by pushing forward the casing, inasmuch as the disc is then removed from the brake lever and the plate freed from its engagement with the nose of the same.

"At the upper end of the bottom plate a box is attached, the object of which is to receive the flashlight cartridge, it having at its bottom a slit to receive the nipple or fuse of the cartridge. The latter may be secured in any suitable manner in the box.

"When a cartridge placed in the box is to be exploded, it is necessary to push forward the casing by means of a latch or the like, until the disc, which is then set in rotation, reaches the fuse, thereby exploding the latter.

"This having been accomplished, the latch is released, and the casing together with the disc is, by the action of the springs, pushed back to its initial position. The disc now again engages with the brake lever as above described, and the clockwork immediately stops.

"Instead of employing the rotating disc a bar with rubbing plate may be used which, with the aid of a rotating frictional or toothed attachment in connexion with a toothed bar or the like, is brought in contact with the fuse; or in place of that bar a percussion pin, coated with a frictional substance, may be employed so as to strike against the cartridge, thereby exploding the same."

Mr. C. A. McEvoy's improvements:—

The apparatus is formed of a base plate having at one of its ends a spring clip or holder to carry a short candle, having two, three, or more wicks in a line, and at a distance apart from one another, so as, when ignited, to produce a broad sheet of flame through which magnesium powder is projected—the candles may conveniently be made up of three or more short lengths of candle, of small diameter, stuck together side by side. The candle will burn for a sufficient length of time, and, when one has been burnt out, another can readily be put in its place.

"The magnesium powder to be projected through the flame is placed into a tubular holder, which is directed towards the flame, and which can be slidden endwise to and fro within a cylinder fixed to the base plate. At the back of the tubular holder I place a coiled spring, which tends to throw the holder forward towards the flame. I also provide the holder with a stem projecting backwards from it, by which it can be drawn back, and also provide a spring catch for retaining the stem when drawn back. When the tubular holder is held back in this way, the requisite quantity of magnesium powder can be poured into it, and, if the candle has been lighted, the 'flash' can at any time be produced by releasing the spring catch, either by depressing it by the finger or by pulling a cord, or otherwise; the coiled spring then throws the tubular holder quickly forwards, and the powder by its momentum is projected through the flame. The apparatus can either be held in the hand, or rest on a table, to be fixed to a pole or otherwise, and can be held in either horizontally or vertically without interfering with its action."

In place of employing a powder-holder, which is thrown forward to project the powder into the flame, a fixed holder might be used formed with a passage projecting forwards for a distance from its rear end and leading to a nozzle having a flexible pipe extending from it to an elastic ball by quickly compressing which, a blast of air may be directed into the rear end of the powder-holder, and the powder be thereby blown forwards into the flame.

JOLY'S TRANSLUCENT COLOURED SCREENS.

In describing his invention of translucent coloured screens for use in his process of "colour photography" Dr. Joly says that fine silk threads or other suitable filaments, dyed or otherwise, given the required colours, are laid down upon a support of translucent or transparent glass or on some other support through which light can pass, as, for instance, a frame with a central opening; the filaments are imbedded in or otherwise treated with varnish or other translucent adhesive medium, serving to impart translucency to the filaments or to increase any translucency they may originally possess, and to cause them to adhere to the surface of the support and preserve them from injury. The filaments are preferably laid parallel with each other and in contact. In this way a multi-coloured screen, consisting of a pattern of fine translucent or transparent parallel lines can be obtained. Thus, red, green, and blue filaments may repeatedly succeed each other upon the support. The colours employed need not, however, be red, green, and blue; they may be any colours suitable for taking or for viewing the image by the particular process of colour photography in which they are used, or they may be such as will serve both for taking and viewing the image, or two colours, or four or more colours, for special colour effects, may be used.

The glass plate or other support may be coated before, after, or during the deposition of the filaments thereon, with the aforesaid varnish or other suitable adhesive medium; this medium should preferably be of as nearly as possible the same refractive index as the filament. It may consist of a crystal varnish made of any suitable resin, or of a varnish of Canada balsam in a suitable solvent, or of dextrine, collodion, gum arabic, gelatine, or the like. When any medium which is not waterproof, such as dextrine, for example, is used to receive the filaments or attach them to the plate, I may subsequently apply a coating of waterproof varnish to the surface of the non-waterproof layer, in order further to protect the filaments.

The colour, if carried as a dye upon a silk filament, should preferably be imparted to the filament before the latter is placed on the support.

The filament may consist of ten, twenty, or more constituent silk fibres, or fibres of artificial silk, or of a less number, or of one fibre, according to the width of the line of colour required in the screen.

The several coloured filaments may be brought together from reels before being applied simultaneously to the surface of the support, but so as not to mingle together or overlap one another. Thus one reel may supply red, another green, and a third violet filaments, or several reels carrying each a single-coloured fibre, or more than one fibre, may be used to make up each line of colour on the support. Thus there might be five or ten reels of green fibre to build up the green filament.

The filaments may be prepared so that the individual fibres thereof are held together by an adhesive material till they are laid upon the support; this adhesive material is then dissolved out or melted to fluidity, or it is so chosen as to be soluble in a medium previously laid upon the plate.

Thus, if the fibres are coated or retained together by dextrine, this will dissolve in a solution of dextrine previously laid upon the plate; or the filaments may be of one fibre each, and these may be of silk or artificial silk of the required dimensions; or a filament of one colour only may be laid down at one time to be succeeded by the other colours applied immediately or subsequently. I may use other material than silk for the filaments; for instance, glass, cotton, or celluloid in the form of fine filaments, artificial silk, especially drawn silk gut, or other suitable threads or fibres, natural or artificial.

The several filaments or threads may pass through a bath of varnish, dextrine, or alcohol, or other suitable medium before reaching the plate; this medium serves either to retain in coherence, or wash or desiccate the fibres of which the filaments are constituted, or the filaments may be desiccated by being passed over a heated roller before reaching the support.

A burnished roller, smooth straight-edge, or soft pad may be drawn along the freshly deposited filaments immediately after their deposition, pressing them against the support, serving to smooth them down, straighten crooked fibres, and expel air from them when they are applied wet or on a varnished support. A smooth blade or guide may also be provided to run along the outer edge of the freshly deposited filament to smooth the edge of the same and press in any projecting fibres.

After the support is completely supplied with filaments and varnish it may be pressed, when the varnish is nearly dry, against a flat, hard, polished surface, in order to confer a smooth surface upon the facing of filaments and varnish.

To secure the required regular deposition of filaments on the support, I may adopt any of the following contrivances:—

The filaments can be received upon a polygonal cylinder or drum, upon the faces of which may be attached a convenient number of the translucent plates or other supports; or the drum is cylindrical and wrapped round with celluloid or other flexible support, upon which it is desired to deposit the filaments. This cylinder or drum is rotated uniformly before the nipple delivering the threads, and, simultaneously with its rotation, it is displaced in the direction of its axis at a uniform rate. Or the drum rotates on fixed bearings, while the support carrying the nipple, or both the nipple and reels, is displaced longitudinally. In the first case, a screw carried upon a prolongation of the axis of the drum, and engaging in a fixed nut, will cause the drum to be displaced longitudinally in its bearings simultaneously with its rotation. In the second case, the support carrying the nipple, or both the nipple and reels, may be provided with a nut which engages with a "leading screw" geared suitably with the rotatable drum. Or, instead of the cylinder or drum, a frame carrying two supports only, placed back to back, may be employed for a like purpose. In the foregoing apparatus the supports may be stationary, and the reels and nipple may be carried round the drum or cylinder, simultaneously advancing parallel to the axis of the drum. In screens produced by such devices, the lines of colour are short lengths of spirals.

It is convenient, when a sufficient number of filaments have been laid on the frames, to apply adhesive material to them at the edges of the frames to attach them to the latter, and when, this is hard, the frames can be severed from one another.

A machine of the nature of an ordinary ruling machine, in which the pen or graving tool is replaced by the nipple delivering the silk, may be used to deliver the filament instead of the rotary devices previously described. A large screen may thus be coated with filaments. At the completion of each line the filament may be laid reversely to form the next line, a line being thus laid at each stroke of the machine.

Or the filaments may be first brought into a warp of parallel threads, in the correct alternation or order of colours, somewhat in the manner in which the warp is made ready for the weft in the practice of weaving.

Against this warp the support is applied, carrying varnish or some other adhesive medium in a tacky or wet state upon its surface, so as to engage with and retain a series of parallel filaments. Or the varnish can be applied after a dry support has been applied to the web. Or the individual, separate coloured filaments may be caused to take the correct positions for the formation of a warp by placing properly disposed notches on the opposite sides of a warp-straining device, and then applying the support to the filaments thus stretched, these latter being caused to adhere to the support by an application of varnish.

I may use filaments of only one colour on each warp-straining device. In this case the said device may be provided with regular indentations on the edges, serving to guide the filaments to the correct position. For three filaments the notches on the warp-straining device would be at a distance apart equal to double the width of one filament, so that sufficient space remained between every two adjoining filaments to subsequently receive two other filaments. In the winding of such devices, which may be effected on rotatable carriers of the kind hereinbefore described, I may dispense with accurate leading screws for the carriers or other rotating appliances, relying upon the regular spacing of the aforesaid notches. The three several webs so obtained may then be successively applied to the support, or may be applied thereto simultaneously if the devices are of such dimensions that one may be fitted into the other, so that the three series of filaments will come properly into the one plane.

I may also weave the filaments into a fabric to be applied to the support, the coloured threads forming the warp, and the weft consisting only of a sufficient number of colourless threads to cause the threads of the warp to retain their proper relative positions until they are secured on the support.

In the foregoing methods of depositing the silk or other filament, more than one nipple, each delivering the complete set of colours, or each delivering but the one colour, may be used.

In any of the machines hereinbefore referred to I may introduce an automatic arrangement whereby the machine will stop running in the event of a thread breaking, or whereby notice of such breakage will be given by the ringing of a bell.

In place of using ready-manufactured or natural filaments I may prepare these immediately before their application to the plate. Thus filaments of rapidly drying material, such as artificial silk, may be expelled or drawn from minute perforations communicating with a supply of the viscous substance suitably dyed.

Dr. Joly's claims are: 1. A screen for use in colour photography consisting of translucent coloured filaments. 2. In a screen for use in colour photography, the combination of translucent coloured filaments with means for retaining them in the desired position relatively to each other. 3. In a screen for use in colour photography, the combination with a "support" of a series of translucent coloured filaments carried thereby, and means for retaining those filaments in place relatively to the support. 4. In a screen for use in colour photography, the combination with a "support" of translucent coloured filaments, and a coating of adhesive material to protect them from blows or from the action of moisture and keep them in place. 5. In a screen for use in colour photography, the combination with a "support" of coloured filaments carried thereby, and rendered translucent by being impregnated with varnish or the like. 6. In a screen for use in colour photography, the combination with a "support" consisting of a sheet or plate of translucent material of translucent coloured filaments carried thereby. 7. In a screen for use in colour photography, the combination with a "support" of a single translucent coloured filament in a series of turns thereon. 8. In a screen for use in colour photography, a warp of coloured translucent filaments having a weft of colourless filaments. 9. A method of manufacturing translucent coloured screens which comprises the operation of winding the translucent coloured filament or translucent coloured warp helically upon a carrier, whereon the "supports" for the filament are placed. 10. A method of manufacturing translucent coloured screens, which comprises the operation of delivering a coloured filament or more than one coloured filament from a delivering device into the desired position on a "support" by reciprocating the said device relatively to the support, or *vice versâ*. 11. A method of manufacturing translucent coloured screens, which comprises the operations of forming a warp of coloured filaments and laying against it an adhesive "support" to engage such filaments, or laying against it a "support" to which an adhesive material is subsequently applied.

COMBINATION PRINTING.

[Manchester Amateur Photographic Society.]

In attempting to interest in you on combination printing, I do not wish you to run away with the idea that I am advocating the use of two or more negatives to produce a picture on all and every occasion; it is only now and again that these expedients have to be resorted to, and each year, as our mechanical appliances become more perfect, they become less necessary.

The successful use of several negatives depends largely upon the skill, care, and artistic taste of the operator, the latter quality especially being brought most prominently into play; but, even with the necessary skill, the artist is generally hampered by the want of adaptability in photography. A painter often introduces extraneous objects in his picture, and omits others, which would be almost impossible to the knights of the camera, though there are many things we can do to improve our pictures by double printing, such as the addition of trees, rocks, or other objects in the foreground. Some enthusiastic photographic mechanics may object and challenge the right to play fast and loose with photography in this way; but, when your sole aim is to produce a picture, and not a portrait, it matters little as to the means taken to produce that end. I have brought down a few hurriedly printed photographs, which will, perhaps, illustrate what I mean. The one of the river from Otterspool Bridge has received four separate printings — first the landscape, then the clouds, &c.

The use of separate cloud negatives has been so fully described by me that I do not care to occupy much of the time now by repeating what I said before, though I may briefly demonstrate the mode of procedure. Every one present will, I think grant me that a white sky is unnatural, and that, unless clouds are obtained in the original negative, it is better to print them from a second negative, and by so doing many an otherwise uninteresting subject is made pictorially interesting.

I have here a print with a white sky, and one with clouds added by double printing. It is done in this way: First print the landscape, then take away the negative and substitute a suitable cloud negative (and there is much food for thought in that word suitable), and, covering up the portion already printed, carefully print in the clouds, watching the progress every few minutes, so that the clouds do not overlap the light portions of the landscape, or fall short, so as to leave a light space between the two; the former is the lesser of the two evils. I find it advisable to print the clouds in the sun, keeping the cover in motion. May I repeat, to emphasise a former utterance, Do not print the clouds too dark?

The next printing is the reflection of the clouds on the water. To have the surface of water white is just as great a mistake as in the sky, and, to get over this difficulty, we must turn the cloud negative upside down, taking particular notice that the angle of reflection is correct, and that they are printed to the right depth, that is, a shade deeper than the counterpart above.

The next addition is that of a foreground. This is easily done when we have only water to contend with, and, fortunately, it is then we need a foreground most. To obtain a balance in a picture, a tree or some such object may be necessary, and, in printing the landscape, any dark object which would come across the tree must be covered over, care being taken that the covering does not overstep the boundary of the trunk.

Portions of many apparently useless negatives can be used in this way. I make it a rule not to destroy a negative unless really worthless, for at least a portion of it may come in useful at some future time. A slide I showed at our last Exhibition, and which gained some applause, was one that had been put away as being unfit to be exhibited. It was hard—"soot and whitewash," but, by the addition of clouds, ripples on the white water, and a strong foreground, it made quite a presentable appearance, and was used as an important collecting link in the series.

Another and very effective method of combination printing is to produce several pictures on one sheet somewhat after the manner of a mosaic, and it might be used for birthday or Christmas cards. Several pieces of white paper of different shapes and with black borders are arranged on a board, and then photographed. To do this it is better to place the board on the floor, and point the camera downwards. You have now a negative with several white spaces. From this print on thin paper, such as albumenised, two or three prints, and cut out masks from them (unfixed). Also make another for the finished picture, and on this print from any other negative on the white spaces, using the masks to cover up all the other portions. When all the spaces are printed upon, tone and fix as usual.

Pictures of statuary have very often unsuitable backgrounds, and to get over this difficulty all that is required is a steady hand and a sharp knife. A rough print is taken on thin paper as before, and on a piece of glass carefully follow the outline of the figure with a knife. Expose this to the light and you have a black mask. Having obtained a print from your statue negative, place it against a piece of plain glass with the mask intervening, and print until all detail in the background is obliterated. This *modus operandi* is very useful when the statue is enclosed in a glass case, like the statue of "Echo" at Peel Park. If the outside mask is used when printing the figure, so as to have a white background, a floral or landscape could be substituted in place of the black background.

J. W. Wade.

Gospel Oak Photographic Society.—April 21, the subject on the programme was the exhibition of some prize slides.—These were passed through the lantern by the Secretary before a large number of members and their friends, who admired and criticised the beautiful and various subjects put before them.

A feature of the above Exhibition was that the oxygen gas, instead of being brought to the hall compressed in cylinders, was manufactured as required by the aid of the lantern in a generator invented by Mr. Stedman, who demonstrated its capabilities to the entire satisfaction of the members present, the light fully illuminating a fifteen-feet disc.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*June* 5, 1896.

THE LANTERN RECORD.

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LANTERN MEMS.

Animated photographs are everywhere. One might almost say, with regard to them, "They come not in single spies, but in battalions;" and, as to their names, it seems almost as if the final "graphe" could hardly do duty for any more prefixes to express motion, what with the animatograph, cinematograph, theatograph, vitagraph, motograph, panoramograph, and kinematograph, besides the kineopticon.

* * * * *

This form of illustration has undoubtedly "caught on" with the public, and such is the demand for machines that are capable of projecting the designs with anything like fair results, that there is the greatest difficulty in getting an order executed, and, as regards the design films, there is barely one to be had in London, except at a premium, and the film-makers in England, not having anticipated the sudden demand, are not in a position to supply, except at fairly long notice, the blank films for producing new subjects.

* * * * *

Most of the machines introduced since the public appearance of Lumière's Cinematograph are dependent on the Edison Kinetoscope for the films, and these in some cases give remarkably good results, but in the majority of instances are denser than they should be for projection. Those who have produced photographs themselves from films specially made, and then made transparencies from them, get brighter and clearer results; and as the whole matter becomes commercial, and professionals and amateurs are able to photograph what they most fancy, some excellent examples will, no doubt, be forthcoming.

* * * * *

I went to see an apparatus that I understood was the outcome of Edison's inventive genius, and which was announced to be the steadiest extant, and, hoping to witness a decided improvement on what had been produced before, I must confess I was disappointed to find the results not equal to those obtained at the Empire and the Alhambra. In these matters a great part of the success is due to stage management and due regard for impressions. The apparatus was, I believe, of American make, but not solely Edison's.

* * * * *

To be in a room of comparatively small size and fairly illuminated with a particularly strong light just in front of the screen, and then, as in this case, with scarcely any interval between the switching off of the light and the projection of the picture, it follows naturally that the result is comparatively dull, for the eyes of the audience are flooded with light, and by contrast the picture seems dim. If the lights were turned down at least a minute beforehand, then the eyes, accustomed to darkness, would appreciate the light when the picture is on the screen. After each scene again the lights were turned up, and so a constant dilatation or contraction of the pupil of the eye was going on, and consequent weariness. This, when pointed out to the management, was acknowledged, and will, I believe, be obviated in future.

* * * * *

A similar thing takes place at some of our scientific societies and institutions, and, venturing to risk being thought to harp on one string, I must emphasise this, after attending a lecture at the Royal Institution (I think it was the one when M. Lippmann read his paper on *Colour Photography*), when it was brought forcibly home to me, so much so that I had to shield my eyes to lessen the fatigue. There is no occasion to have a place so brilliantly lighted when the demonstrations take the form of lantern or optical projections, and just sufficient light to make the lecturer visible to the audience and themselves to each other is all that is wanted. The admiration of the notables or fashionably attired can be managed before the lecture commences, or before the lights are once turned down for a projection to be made, as that is the time for the *majority* of the electric lights to be switched off, or, if gas, to be turned down.

* * * * *

The conversazione of the Royal Society was conspicuous for the photographic element and the assistance the optical lantern lent in demonstrations. The New Photography was placed in the front, rank, examples and demonstrations being shown and made by Mr. A. A. C. Swinton, Mr. Sidney Rowland, and Mr. Herbert Jackson, while a rapid mechanical photographic printing apparatus was exhibited by Mr. Friese Greene, which permitted photographic reproductions in periodical or book form to be turned out at the rate of 2000 per hour. Another exhibit was a remarkable series of instantaneous photographs of splashes by Professor Worthington and Mr. R. S. Cole, the exposures being less than three-millionths of a second the progress of the bubble formed by a drop being recorded and any stage picked out within limits of error not exceeding generally about two-thousandths of a second.

* * * * *

Added to the above in the photographic line, one has to notice Captain Abney's apparatus for producing on a screen or photographic plate monochromatic images; Mr. F. Maclean's photographs of the spectra of characteristic helium stars, and photographs of the spectra of six stars of the third magnitude; Mr. Ives's stereoscopic photo-chromoscope; Professor Meldola's demonstration of Professor Lippmann's colour photographs by the interferential method; more photographs of spectra of stars by Mr. J. Norman Lockyer; and also photographs showing position of coronal spectrum rings in total eclipse of the sun, April 16, 1893. Photography was also

employed by Mr. C. Carus Wilson to show "cup and ring" markings naturally formed in stucco similar to those seen in rock faces, and usually ascribed to the hand of prehistoric man. A further series of photographs of spectra of flames produced by the Bessemer process during the "blow" and "over-blow" were exhibited by Professor Hartley.

G. R. Baker.

SOUND CURVES WITH A LANTERN.

It is so customary to speak of the optical lantern as almost owing its existence to the art of photography that its many practical applications in which photography has no share are, in a great measure, lost sight of. It is true, no doubt, that before the advent of sun-painting it was, to all intents and purposes, nothing more than a mere toy, but it does not, by any means, follow that its sphere of usefulness is confined to the projection of photographic pictures. It has no equal as a means of making visible to large numbers of persons many significant scientific experiments, which, from their nature, must be performed upon too small a scale to be of any use for lecture-table demonstration, but which are, nevertheless, most important for teaching purposes. For instance, a large number of chemical reactions can be rendered perfectly understandable and interesting with the lantern's aid which, if performed on the platform on a scale even twenty times as large, would be clear only to those in the first or second row.

The majority of chemical operations, to be successfully performed in the lantern require the instrument to be fitted with an erecting prism in order to exhibit the experiments, which cannot very well be inverted before they are placed in the lantern, in an upright position, otherwise some of them would be very difficult to understand. For instance, the bubbles rising from a metal, say, being dissolved in dilute acid, appearing on the screen like huge globules of molten metal, falling heavily to the bottom, is decidedly mystifying to an audience that has not mastered the art of standing on its head.

But all this is very obvious. Many of the experiments connected with the science of optics, as adapted to the lantern, have already been most ably explained to the readers of the Lantern Record, and I should like to point out how a few of those appertaining to acoustics may be rendered intelligible to lecture audiences through the medium of the lantern.

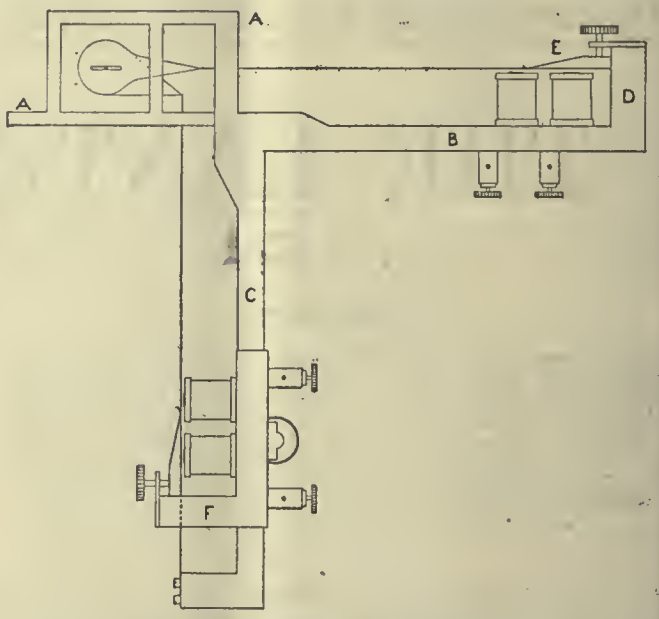
The illustration, fig. 1, represents, somewhat diagramatically, a little instrument which I have designed to show sound curves projected upon the screen. The usual way of showing this most beautiful and instructive effect is to employ two upright rods capable of vibrating at right angles to one another, each being fitted with a small mirror. A parallel beam of light is made to traverse the two mirrors, and, when the rods are caused to vibrate, the spot of light upon the screen darts about, and produces the characteristic sound curves of the particular relative vibrating periods of the two rods employed.

Such an arrangement, of course, necessitates a special form of lantern, giving a parallel beam of light, besides the vibrating rods and their mirrors, and it necessarily involves a deal of careful adjustment, and, unless the rods are kept in continual vibration mechanically, the resulting figure is considerably distorted.

The little piece of mechanism shown in the diagram is designed to fit the slide stage of any ordinary, not *science*, lantern, the usual combination of lenses being all that is required. It consists of two vibrating rods, one vertical and one horizontal. The plane of the vibrations is in each case at right angles to the optical axis of the lantern; that is to say, the horizontal rod vibrates up and down, while the swing of the perpendicular rod is horizontal. At the extremity of each rod is a disc of sheet metal, having a slit cut in it parallel to the length of the lath, and therefore at right angles to the direction of vibration.

For convenience' sake, and in order that the apparatus may the more readily be placed in an ordinary lantern, the vertically slotted metal disc is not connected directly to the vertical rod in the same straight line, but is attached to it by means of an elbow piece, as shown at A. The horizontally slotted disc is directly connected with its vibrating rod. But perhaps it will be as well to describe the manner in which the instrument is made, and its action can be then more easily explained.

A A is a wooden frame of the size and thickness of the frame part of an ordinary to-and-fro carrier, and having two arms, B and C, continuations of the bottom and one side of the frame, extending vertically and horizontally for about sixteen or seventeen inches. As the function of each is much the same, we may take the arm, B, as being typical of both. Near the end of the arm most distant from the "carrier" portion or field is a small electro magnet, whose duty it is to keep in continuous vibration a steel spring or lath, whose end is firmly fastened to the support, D. The arrangement is precisely the same as that employed to ring an ordinary electric bell. The current passes from the battery through the magnet by way of



the little contact spring, E, which normally presses against the steel lath and completes the circuit. Directly the battery is put into action, the iron core inside the bobbins of wire becomes a magnet, and the steel vibrating rod is attracted towards it; but, in doing so, it parts company with the contact spring, E, with the result that the electric circuit is immediately broken, the magnet loses its power, and the lath is free to fly back again. Then it again encounters the contact spring, E. Again it feels the pull of the magnet, and so, as long as the current is maintained, it continues to fly backwards and forwards *with its own particular period of vibration*, depending upon its length, weight, thickness, and rigidity, just as any other vibrating body.

Now let us see the effect upon the screen. It will be remembered that, while the instrument is quiescent, the field of view is occupied by two metal discs, one having a vertical and the other a horizontal slit cut in it, and of course, where these two openings intersect one another, there will be a single small square spot of light, which will occupy the centre of the sheet. The effect of causing the horizontal lath to vibrate will be to lengthen out this spot of light into a straight vertical line, whose appearance will not be much affected by difference of period in the vibrations, but whose length will correspond to their amplitude. This amplitude, or distance through which the end of the rod swings, depends upon several factors, of which the strength of the magnet is one; but, given a magnet of sufficient strength for the work it has to do, the amplitude of the vibrations can be controlled by varying the elasticity of the contact spring, E. A small thumb screw gives a means of controlling the pressure of the spring upon the steel lath. In the same manner, the effect of causing the vertical lath to vibrate is to produce upon the screen a horizontal band of light.

The arm, C, carries the vertical vibrating lath, held firmly at the end by means of a support precisely as in the other case; but, after that, a difference comes in, for the magnet, together with a block of wood carrying the contact spring, are mounted upon a carriage sliding upon the supporting arm. The block, F, to which the contact spring is attached, has a slot in it, through which the vibrating lath passes, and by which it is tightly clamped, though not so tightly that it cannot be slid through, as the distance between F and the end support of the lath is varied. This block, F, forms what in a musical instrument would be called a "fret." It acts as a clamp on the lath at any point in such a way that the vibrations begin, as it were, from that point, all portions behind it remaining at rest. Practically, therefore, it varies the length of the vibrating lath, and, as the number of vibrations per second varies inversely as the square of the

length of any vibrating rod, other things being equal, it follows that we have here a ready means of varying the period of the vibrations, or the pitch of the note, as a musician would call it. It is advisable to have a rack and pinion fitted to this sliding portion, for greater convenience in varying the length of the vibrating part, for accurate "tuning" of the two laths, either to unison or to the recognised musical intervals, is of great importance when demonstrating the theory of music.

Let me give a rough idea of the manner in which an experiment with this instrument—to show, say, the difference between harmony and discord—may be performed, for that will give a better insight into its capabilities. First, however, a word as regards the motive power, electricity. I have found the most convenient form of battery for such work as this to be that known as the dry cell, and I prefer Dr. Lessing's pattern to any other I have tried; but a single cell, of the one-fluid bichromate of potash type for each magnet would perhaps be the best, if not the most convenient. To get the best results with the dry battery, two cells should be used to actuate each magnet; but, whatever form of cell or cells is employed, each magnet should have its battery all to itself, to avoid any sympathetic action between the two vibrating systems.

Now for the experiment. Before commencing, let both laths be turned to unison, that is to say, let the length of the two rods (other things being equal) be precisely similar. Turn on the light, and show the small square spot in the centre of the disc. Now connect the upper magnet with its battery, and the spot upon the screen will immediately be lengthened out to a vertical band of light. After explaining that this is due to the vibration of a single rod, emitting a note of a certain pitch, break the circuit again, and, when the spot of light has come to rest, connect the other magnet with its battery, and show the spot stretched into a horizontal band of light, explaining that its motion is due to the to-and-fro movements of a vertical rod. Now connect both magnets with their respective batteries, and show how the two motions are combined in one, producing either a straight oblique line from corner to corner of the sheet if the two sets of vibrations are strictly in "phase" with one another, that is to say, start and finish their to-and-fro journeys exactly together, or, if one is ahead of the other by half a swing, the spot of light will describe a circle. Should the figure be oval in shape, it will show that one rod is swinging just a little ahead of the other, though each is occupying exactly the same fraction of time to complete a vibration. In any case, the figure is of the simplest possible description. It denotes a unison, and unison is the purest harmony.

A very small touch of the pinion head will suffice to throw the vertical rod slightly out of tune with its neighbour, and the figure will then gradually twist itself from the circular through all the degrees of oval to an oblique straight line. Then it will become a thin oval again, which will fatten out into a circle, to be flattened again on the opposite sides until it becomes a straight oblique line stretching between the two opposite corners to those before occupied. Every time it completes a cycle of changes, one rod will have gained upon the other to the extent of one vibration. This illustrates the phenomenon of "beats," which are always heard when two musical notes, slightly out of tune with one another, are sounded together. When the two vibrating bodies are swinging in phase with one another, the resulting sound is at its maximum intensity; but, when one is half a swing ahead of the other, each tends to undo the other's work, and the sound is at its minimum.

Now allow the spot of light to come to rest for a moment while the adjustable vibrating rod is set to half its original length, which, in musical parlance, would be called sounding the octave of the original note. Next to the unison the octave is the best possible harmony, which can be easily understood when it is remembered that in such a case one rod will be emitting two waves to every one of the other; consequently, the sound curve, as shown upon the screen, may be expected to be of a simple form, and so it is. Those conditions, which in the case of the unison produced a circle, will now yield the figure 8, which is, of course, tantamount to two small circles merged into one figure, while the oblique line becomes, in this case, a semicircle. Again, when the rods are thrown slightly out of tune, the changes will be rung between these two figures as before, the 8 gracefully twisting itself into a semicircle, first on this side, then on that.

The two rods may now be tuned to all the various musical intervals, showing why some consonances are much more pleasing to the ear than others, the figures of the more pleasing chords being simpler and less complicated in design, while the dissonances are easily distinguished by the rapid and continual contortions of their representative figures.

CECIL M. HEPWORTH.

TAKING AND PROJECTING KINETOSCOPIC PHOTOGRAPHS.

MR. BIRT ACRES' SYSTEM.

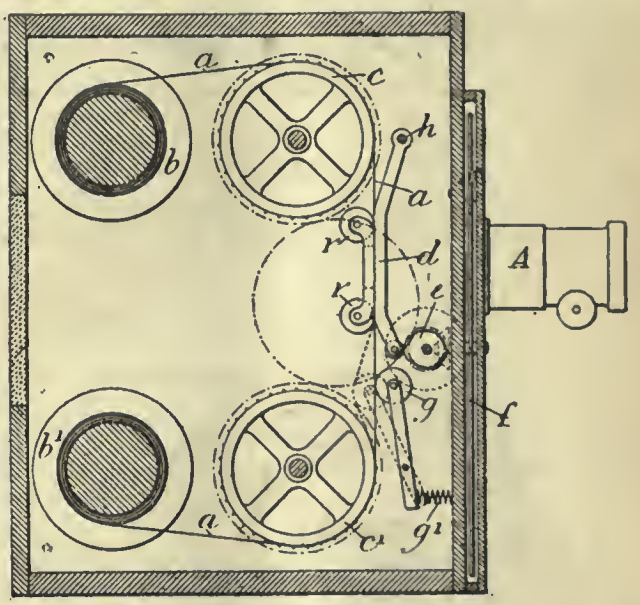
MR. BIRT ACRES' description of his improved apparatus for enabling photographic images to be taken, projected, or viewed, in rapid succession, is as follows:—"It consists more particularly in so arranging the apparatus as to permit of the film being clamped for the period necessary for exposure, projection or viewing, without causing undue strain on the film notwithstanding that the motion of the apparatus is continuous.

"For this purpose a continuous sheet of film is drawn by feeding wheels off a roller by means of two pin wheels taking into perforations made at the edges of the film. It is caused to pass behind the lens and is clamped there for the short period necessary for exposure. The clamping is effected by an open frame pressed against the film by a cam turned by gear from the axis of the shutter, which is turned by hand or otherwise.

"During the time the film is so clamped, the pin wheels still revolving would cause undue strain on the film. This I obviate by causing the film between the clamping frame and the pin wheels to be deflected out of the straight line by a roller acted on by a spring. Whilst the film is travelling this spring deflects the film, but whilst the film is clamped the spring yields and the pin wheels continuing to revolve take up the slack. Immediately the clamp is released the spring again acts on the roller, causing the film to be deflected as before. The film is then wound on to a second roller.

"Instead of acting on the deflecting roller by a spring, it may be moved by a cam lever timed to the cam which works the clamp.

"The accompanying drawing is a section of the casing of a photographic apparatus with mechanism according to my invention for



moving and clamping the film. A is the objective tube, behind which is mounted the disc shutter, *f*, which is caused to revolve by hand or otherwise, driving by any suitable gear a cam, *e*, and pin wheels, c c¹, over which passes the continuous film, *a*, drawn from one spring roller, *b*, and wound on another, *b*¹.

"The film passes between a pair of rollers, *r*, and the face of a lever, *d*, which is pivoted at *h*, and is alternately pressed by the cam, *e*, against the film clamping it and holding it stationary, and releasing it so as to allow it to move onwards. The pin wheels, c c¹, which are geared together, are so set in the first instance as to leave between them a certain amount of slack of the film which is taken up by the roller, *g*, urged by a spring, *g*¹, causing a bend of the film. As the wheels go on while the film is clamped, the wheel, c, delivers slack, and the roller, *g*, yields, allowing the wheel, c¹, to take up the slack of the bend."

The patentee's claim is: In photographic apparatus, in combination

with continuously revolving feeding and drawing wheels for moving the film, and a clamp for temporarily holding it, a roller arranged to deflect the film while it is not clamped, and to yield while it is clamped.

STEREOSCOPIC RÖNTGEN SHADOW PICTURES.

[Journal of the Franklin Institute.]

The ordinary single shadow picture, as produced by Röntgen's method shows the position and dimensions of an object in a single plane only The thickness, depth, or relative positions of objects in a direction perpendicular to the plane of the sensitive plate are not shown or indicated in any way. Thus, in a shadow image of a hand, showing the bones with a faint covering of flesh, there would be no indication of a flexure of a finger or of its being directed upward or downward. Neither is there any indication of the actual position of the bones within the soft integuments, except in the direction of length or breadth. The third dimension is missing.

It may, however, become useful in surgery to know the actual space slations of objects involving all three dimensions. To do this, we may take advantage of the principles of stereoscopic vision as in the stereoscope, which the writer has found perfectly feasible. A moment's reflection will, however, show that stereoscopic shadows are something of a novelty in themselves. A shadow is ordinarily thrown upon a surface, and is seen simultaneously by both eyes. An ordinary shadow having no thickness cannot, of course, be seen stereoscopically. With Röntgen shadow pictures we can, however, secure stereoscopic effects in a very simple way. If we take one such picture of an object or set of objects with the Crookes' tube in a certain relation to the objects and sensitive plate, then place another plate back of the objects and obtain an impression upon it with the Crookes' tube somewhat displaced laterally from its first position, we obtain two stereoscopic shadow pictures, which may be used to produce prints to be viewed in the stereoscope. The shadow of a coiled spring, for example, obtained in the way mentioned, will, in the stereoscope, show the turns of the spring in relief. The bones of the hand will be seen in space surrounded by the hazy flesh, and, if one or more of the fingers be flexed, the degree of flexure will be indicated. A foreign object embedded in the soft tissues would thus have its position with respect to the bones at once declared. As furnishing a background from which depths may be seen or estimated, it is well to place between the object and the sensitive plate a netting of wire with open meshes, which casts a distinct shadow. In such case the stereoscopic shadow images, when viewed stereoscopically, show the objects above the screen and at proper relative distances therefrom. This netting, or screen, also ensures the proper mounting of the pictures in relation to each other; for, should the screen be seen in the stereoscope above the objects, it would indicate that a transposition of the pictures had been made, and that for correct indications to be obtained the error must be remedied.

A number of experiments, made with a view of testing the method above described, have been made by the writer, and have given very satisfactory results. The skeletons of small animals may be thus examined in relief, and the actual position of objects embedded in solid material discovered. It is conceivable that by the use of a fluorescent screen, and two cathodes placed some distance apart in the Crookes' tube, these cathodes receiving discharges alternately, and thus producing two separate displaced sources of Röntgen rays, two stereoscopic fluorescent images may be produced on the screen. If, now, shutters or diaphragms are placed between the screen and the eyes, opened and closed synchronously with the discharges, and alternately with respect to each other, the image will be seen on the screen stereoscopically. In this way, by a rapid examination, the true space relations of embedded objects may be noted. Elihu Thomson.

ALL ABOUT ACETYLENE.

[American Journal of Photography.]

Professor James M. Crafts, of the Massachusetts Institute of Technology, read a newsy and instructive paper on the new illuminating gas, acetylene, before the Society of Arts, in the Kidder Lecture-hall, Walker-building, Boston. The hall was crowded, and great interest was manifested in his statements and experiments. The presence of Boston men financially interested in acetylene, and the fact that they took notes of some figures and facts go to show that the lecture was valuable and brought out new points.

Before beginning his experiments, Professor Crafts briefly told what is generally known about the new gas and the discovery of carbide of calcium, from which acetylene is made by the addition of water. By means of electricity, generated at Niagara Falls, the Professor stated, it is expected that the carbide will be produced at a cost of $23·70 a ton. It is selling now for $100 a ton in New York; but, as there is both limited supply and demand, this cannot be called the true price. Passing on then to the field covered by his experiments, Professor Crafts said:—

"Boston gas has close to 25-candle power and Brooklyn gas a little more—*i.e.*, five cubic feet burned in an hour gives a light equal to 25 candles. The same amount of acetylene gives 200-candle power, and the light is white, clear, and steady—more like sunlight. Under the best conditions, therefore, acetylene is eight times better than the gas we now use. But either our burners are faulty, or we put on shades that absorb about one-half the rays. In practice, we get only about 11 or 13-candle power with our gas. The true test is that of the bill for the gas burned in a house for an extended period. We will know little until this house test comes.

"The acetylene flame clings close to the burner and heats it more rapidly than common gas. Because the light is close to the tip, however, it is valuable for locomotive head lights, and other parabolic reflectors, where it is important to have the rays start close from the focus. The fishtail burner is not suited to acetylene."

The lecturer exhibited several tips of his own make, their construction permitting of the easy circulation of air and consequent gain of a larger volume of oxygen than tips in common use give.

"Pipes of smaller size and better quality than we now have may be used with acetylene," he continued. "The joints may be soldered and all leakage prevented. Leakage is dangerous, as I will show later on. There is no ammonia in acetylene to eat the grease around the stopcock and cause leaks such as now are caused by the ammonia in common gas.

"It is proposed to store the new gas in a liquid form in steel cylinders, where it will have a pressure of 600 or 700 pounds to the square inch. By means of a Pintsch reducing valve, an exceedingly ingenious device, the gas is allowed to escape at very slight pressure. Each cylinder also is provided with a mercury seal, so that, if the pressure gets too great for safety, the seal will break and allow the gas to escape. It is calculated that the seal will be broken in case of fire in the building. Should the cylinder become red hot, the gas would be reduced to its constituent parts—carbon deposited on the interior of the cylinder in the form of soot, and hydrogen. The hydrogen generated would have a pressure of 20,000 pounds per square inch—enough to burst the cylinder and cause great damage. More dangerous would be the probability of the breaking of the mercury seal and the discharge of the gas into the atmosphere. Three or four per cent. of it in air would form a mixture of terrible explosive force. Therefore the use of many of these cylinders in an office building is not to be commended."

After discussing the use of acetylene to enrich common gas, the lecturer said he would pass over its poisonous, and discuss its explosive, qualities. Acetylene is more explosive than common gas. Using a piece of tubing for a popgun, he exploded two mixtures, one of common gas and air, the other of acetylene and air. Six per cent. of the acetylene in air had twice the effect of the same amount of common gas. A room, twenty per cent. of whose contents was acetylene, would be blown to pieces along with the house. The study of the poisonous effects of the new gas, the lecturer thought, would be more practical if a five per cent. instead of a twenty per cent. mixture were taken. A man would not have opportunity to breathe the latter mixture if there was a fire in the room.

Equal parts of the acetylene and oxygen to the total weight of five grains in the popgun made a tremendous explosion. Five grains of gunpowder, the lecturer explained, would not have exploded with anything like that power. "The fact is—and here lies the secret of the great power of the gas—acetylene stores up heat at its birth. It is spontaneously explosive. The danger is slight, but it is there in a peculiar form. If we thrust a burning taper into the gas, no harm is done, but we can get the explosive effect with fulminate of silver. The copper salts of this gas are also violently explosive. I prepared a compound of this kind for this lecture, but it exploded in the drying chamber. The fulminate formed by silver and acetylene explodes with a pressure of 600,000 pounds per square inch in 1-30,000,000th of a second. It is too capricious to be handled under water in the lecture-room, although common fulminates are handled in that way. The danger in our homes would be in the formation of a copper salt near the acetylene tank.

"To sum up, I would say that the peculiar property of acetylene which gives it strength is its storing up of heat. I consider it very desirable that a great deal more work and study be put into acetylene than have been. Its use for gas engines is worth looking into. I hope the companies dealing in it will see their way clear for larger experiments. I would like to see a railroad train from head light to rear lanterns lit with acetylene and given a thorough trial. A small village should be equipped with the cylinders. Only in this way can an old industry which has been built up by years of thought and labour be supplanted."

A TRAVELLING LANTERN SLIDE SCHEME.

[Read before the Congress of Natural History and Scientific Societies of South East of England. Held at Tunbridge Wells, April 25, 1896.]

The very limited time at my disposal will not allow me to expatiate upon the advantages possessed by lantern slides in illustrating the salient



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points of lectures, nor would such a course be at all necessary. During the last twenty years the optical lantern has firmly established itself as an all but indispensable adjunct of the scientific lecturer, for in point of clearness and reliability, to say nothing of ease of preparation and facility of multiplication, the superiority of lantern slides over diagrams is obvious and incontestable. Transcendental critics are to be met with who deny the possibility of an art side to photography, but men of science have thankfully accepted its aid, and by its means are enabled to keep a faithful and permanent record of phenomena that are frequently so evanescent as to elude all other means of representation. It is my duty this afternoon to put before you a scheme whereby, with a comparatively small expenditure of time, labour, and money, our Natural History Societies may have ready access to a collection of slides which shall illustrate as fully as possible the geology of that portion of our country in which we possess a local interest, and which has, intrinsically, an interest far more wide. The foundation of such a scheme has already been laid by the energy of Dr. Abbott, and the response to the appeal which he issued about a year ago has been such, I think, as to encourage us to proceed further. The set of some fifty slides which was circulated among many of our societies during the past winter was the first fruit of this appeal, and may well form the nucleus of our proposed collection. It is not to be wondered at that the result of this first attempt should be incomplete and open to criticism. The slides were very local in character, and consequently not sufficiently comprehensive. The only formations represented were the Hastings sands, the chalk, and the lower Eocene tertiaries; while the Weald clay, lower greensand, gault, and upper greensands were not illustrated at all. The only coast sections shown were those of the chalk and Hastings sands; the only fossils, a few typical ones of the Hastings sands; and no characteristic scenery of the various formations except the above coast sections, the Tunbridge Wells rocks, and a view of the chalk escarpment of the South Downs. With regard to the notes supplied with the slides, there was a very obvious lack of co-ordination and unity of purpose. Some descriptions were far too brief and vague; others erred on the side of prolixity and technicality, and consequently the whole produced a somewhat disjointed effect. All this was inevitable; but the very imperfections serve a useful purpose by suggesting means of improvement, while steps have already been taken to supply the gaps that have been indicated. It is proposed that for next winter slides should be prepared to illustrate the upper and lower greensands and gault, while the tertiary formations might be left for another year's work. Those of us who have had the opportunity of using and studying the slides already contributed cannot but have perceived the promise of much larger possibilities, and, if each society here represented were to take up the matter heartily, these possibilities would soon be converted into realities. There are few, I suppose, if any, of our Natural History Societies that do not include in their membership one or more geologists; or, at any rate, one or more who have some acquaintance with, and take an intelligent interest in, geology. Let each delegate here take the earliest opportunity of bringing the scheme under the notice of such, and persuade them to co-operate. If they should happen to be photographers, so much the better; if not, let them invoke the aid of some fellow-member who is a devotee of the camera. The growth of amateur photography has been so rapid of late years that there should be no great difficulty in arranging this. The names of all willing to help should then be sent to the General Secretary of our Union. Let the Union request some one thoroughly acquainted with the geology of south-east England, to draw up some general instructions and hints applicable to all who have consented to co-operate, and at the same time a special scheme of work for each, as suggested by individual geological situations. These suggestions would then be distributed by the Secretary. Some arrangement of this kind would be advisable so as to prevent overlapping in the spheres of work, and to secure that unity of purpose which hitherto has been lacking. At the same time much would have to be left to individual tastes and opportunities, and any suggestions offered should be regarded merely as such. It is hardly in place, in a brief paper like this, to go very deeply into all those geological details which any scheme of this kind would cover. It would embrace a complete series of coast-sections from the Nore to the Isle of Wight, with the strata clearly differentiated in each slide; sections artificially exposed in quarries, railway cuttings, roads, drainage works, building foundations, &c., more especially when they illustrate junctions of strata; diagrammatic sections to illustrate the geological structure of districts; vaults and their contents; false bedding; unconformability; erosion; and many other phenomena connected with the stratigraphical side of geology. Palæontological side should be well represented by slides of typical or specially interesting specimens of the ancient fauna and flora of our districts, and for this purpose the resources of both public and private collections should be drawn upon. The effects of denudation and its influence on natural scenery; examples of aerial, fluviatile, and marine destruction and construction would also have a place in our scheme. The contributed slides should be entrusted to an official appointed by the committee of the Union, who would make the arrangements for their circulation amongst the affiliated societies. As the carrying out of the scheme in its entirety would involve a large number of slides, it would be necessary to catalogue them with a line or two of description of the salient points of each; the societies could then make their selection; or, as an alternative involving less labour and correspondence, the slides could be divided into sets illustrating the various formations, each set being regarded as indivisible. This, I am inclined to think, would be the better plan, and the remarks which follow will be based on it. Applications for the loan of slides should reach head-quarters before the winter session, say by the end of September, and should specify when they would be required; and, in the case of two societies wanting them by the same date, priority of application should decide. If the order of circulation could thus be arranged beforehand, the expense of returning the slides each time to head-quarters would be obviated. Each society would prepay the carriage, and forward the slides the next morning after use to the society next on the list. Societies which do not contribute slides could have the loan of them on payment of a fee, say of 2*s.* 6*d.* each time of use. The slides should remain the property of the Union, and in the event of its dissolution be returned to the contributors. Notes on the slides should be of such length as to take, on the average, not much more than one minute's reading. It would be a great advantage if a print from the negative of each slide were also furnished, and placed at the head of the corresponding remarks. For the perfection of the scheme, the notes should be submitted to an authority for revision and co-ordination; he would cut down or expand them as circumstances might require, and blend them together into a readable form. Various objections may be urged against the elaboration of any such plan as the one I have sketched. Perhaps the one that will occur first is the fact that geological slides of the highest technical finish may be had from the dealers. To a certain extent this is true, but such slides are chiefly stock ones of fossils, and naturally the dealers have no means of taking advantage of evanescent geological phenomena. On the other hand, the widespread character of our membership presents opportunities denied to the dealers, and in my view it is rather *our* place to supply them and keep them up to date. It is just in this respect that we *can* work for the advancement of science, by keeping our eyes open and being on the alert to secure records of what may shortly be obliterated. A more serious objection is the one that geology appeals to a very limited number. Unfortunately this is the case at present, although there is no branch of science that is more thoroughly English in origin, or that can be better studied than in England. Our little island is a veritable geological microcosm, and a journey of two or three hundred miles across it will present us with more facilities for investigation than a pilgrimage of as many thousand miles through a whole continent. If, then, this part of our plan of co-operation can awaken interest and stimulate research in a somewhat neglected but fascinating study, we shall have done something at least towards that end for which we are met together to-day.

H. E. Torner, B.A., B.Sc.

THE INCANTO ACETYLENE GAS GENERATOR.

F. S. Thorn & Co., 169, Camberwell New-road, London, S.E.

That acetylene as an illuminant for photographic enlarging and optical projection purposes is destined to find very great favour has been our conviction ever since the reading of Professor Vivian Lewes's paper at the Society of Arts last year. The suitability of the light for such purposes is generally admitted, while the simplicity of the necessary apparatus for its generation and combustion obviously paves the way for its general use.

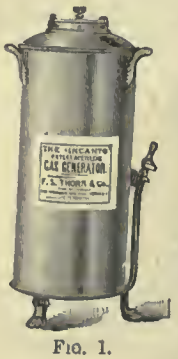


Fig. 1.

Messrs. Thorn & Co. recently gave us an opportunity of testing the working capabilities of the generator they have devised for burning acetylene. Fig. 1 gives an exterior view of the apparatus, the working of which may be understood from the following directions for use:—

"Lift out the inner cylinder or gas-holder, and fill the outer cylinder or tank with water up to the black line marked inside. Then turn the stopcock full on, and attach by flexible tubing to the burner fitting. Now unscrew and remove the cross bar and valve cover at top of gas-holder. Lift out the calcium carbide container and fill same (allowing about one pound for two hours' light with the two-burner lantern fitting). Care must be taken that some small pieces of carbide fall to the bottom, and a space of four inches from the top must be left for expansion. Then replace the container, valve cover, and cross bar, and screw down tightly. Next place the gas-holder into the water tank, and let it slowly sink until the water reaches the carbide, when acetylene gas will be immediately generated. As soon as the gas-holder begins to rise, a light should be applied to the burner, but a perfect flame will not be obtained for some minutes, on account of the air being confined in the gas-holder. No further attention will be required if the gas is kept burning; but, should it be necessary to reserve the gas for a time, the light should be turned very low, and again turned up for a few minutes if the gas-holder rises more than eight inches, as, although the carbide is lifted out of the

water, gas is still slowly generated. When the light is no longer required, the carbide container should be lifted out of the generator and cleaned out. The small tap at bottom of the generator should then be turned on for a minute or two, to draw off the water from the cooling chamber, or the light will jump a little when next used. The container is made to hold sufficient carbide for two hours' light (two burners), but it can be recharged by taking it out, removing the residue, and refilling as before. It is not necessary to lift the gas-holder out, but it should be held up about six inches, when the container is replaced and the valve screwed down. The water level should be maintained as at first. The best way to empty the residue from the container is to hold it upside down and gently rap the sides with a stick, when it will fall out; then rinse out with water and drain dry before refilling, being careful that the small holes are perfectly clear. The gas should always be lighted before placing the fitting in the lantern."

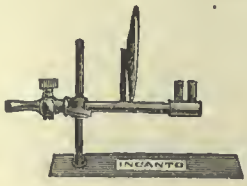


FIG. 2.

Fig. 2 illustrates the burner employed, which consists of two Bray's No. 0000 burners placed T-wise, with a small reflector attached, and fig. 3 the method of attaching the generator to a lantern.



FIG. 3.

The apparatus is exceedingly simple to manipulate, and the light given off very bright, penetrating, noiseless and smokeless. Tested against a good oil lamp and an incandescent burner, its marked superiority was amply demonstrated. For small discs (say up to eight feet) and for enlarging purposes it is not very far behind a blow-through oxy-hydrogen jet. Thorn's acetylene generator deserves to be popular with photographers and others.

NOTES ON SOME PHOTO-MICROGRAPHS OF GELATINO-BROMIDE PLATES.

[Photographic Scraps.]

THE object of this paper is to endeavour to discover what the microscope may show as to the distribution of the grains of bromide of silver in the modern gelatino-bromide plate. It has no reference to the chemistry of the plates nor to their comparative rapidity. So far as I am aware, no microscopic examination of the silver bromide in gelatine films has been made, and it occurred to me that a few negatives might be taken of fast and slow plates which if thrown on the screen by means of transparencies would show some features which might be useful.

I have obtained from various sources a few spoiled negatives, and have, by means of my photo-micrographic camera, taken about a dozen negatives from these plates. I used, for this purpose, my Zeiss 4 mm. apochromatic objective combined with a No. 4 compensation eyepiece, which gave me, at a distance of 18 inches of the plate from the screen, a magnification of 350 diameters. This objective is one of recent make, and probably as fine a lens as is possible to get. I prefer the compensation eyepiece to the projection one, although I have both. The field of view with a 4 mm. lens is ·0135 of an inch when used with this eyepiece. You do not, however, see on the transparencies the whole of this, but only $\frac{7}{1000}$ parts of an inch, as the $\frac{7}{1000}$ parts of an inch are just included within the 2½ inches the diameter of the mask used in mounting them; or, to put it another way, 2½ inches on the screen of the camera just includes $\frac{7}{1000}$ of an inch of the magnified image, First of all I wish, to show two photo-micrographs of collodion plates. I have not worked any collodion for more than twenty-five years, and, as I had no collodion negatives except varnished ones, I have made two photo-micrographs from collodion positives made by myself long before the introduction of the gelatino-bromide plate about 1879–80. I am unable, at this distance of time to say what salt was used as the sensitiser for these plates, but I have no doubt it was a bromo-iodide one.

Plate No. 1 shows the grains of silver abnormally large, the cause of which I do not know, but plate No. 2 shows them in what I regard as their normal state and size. I have measured the size of these grains, they are not all of the same size, but the $\frac{1}{1000}$ to the $\frac{1}{2000}$ of an inch may fairly be taken as the two extremes.

It must be kept in view that, when a collodion plate is placed in the bath, one would not expect the silver to thoroughly permeate the film, but that the greater portion would be found adhering to or near the surface. These two plates appear to show that to be the case. They also show, I think, that the grains of silver keep, to a great extent, separate and distinct from each other. They do not appear to coalesce and form themselves into bundles or groups. They appear to be distributed very much as if one would take a handful of peas or barley, and scatter them on the ground, as by the motion of the hand and arm in sowing. This distinctive character may account, to a large extent, for the slow character of collodion plates.

In the gelatino-bromide plates, on the other hand, a totally different set of circumstances arises. The silver bromide in this case is in the film itself, perfectly distributed in it; and, from the viscous nature of the medium, the silver takes a different form. I have measured the size of the silver grains in many of these films where one could find them separate and apart, and these measurements show that the individual bromide of silver grains are practically the same size as those in the collodion plates.

The divisions in the eyepiece micrometer of my microscope with the 4 mm. apochromatic objective are $\frac{1}{500}$ of an inch apart. The largest of these grains do not quite fill one of these divisions, while two of the smaller grains can lie quite easily in one of the divisions. In gelatino-bromide films, however, the grains do not appear to remain separate and distinct to the same extent as in collodion. They seem to run together into bundles or groups. There is also in a gelatino-bromide plate a certain depth, as it were, filled with silver. This abundance of silver bromide which the emulsion process enables the gelatine to receive and retain would appear to be one at least of the primary causes for the extreme sensitiveness and rapidity of the modern gelatine plate. No portion of the film lacks the necessary quantum of silver. If it is deficient in the upper layer or focal plane, that deficiency will be supplied by an abundance behind. The so-called coarse grain of the rapid plate seems to be entirely due to the aggregation of the silver into bundles or lumps. The separate grains are the same as in collodion, but the gelatine medium on which they are placed seems to have the power to cause them to coalesce and run together.

I am looking into the matter entirely from what the microscope reveals. As to the quantity of silver in the film, the microscope cannot reveal anything. That is a matter for the chemist.

The slides I have made are taken from thin portions of the negatives as I found when using an eyepiece there was a difficulty in getting the light to penetrate the denser developed portions. There are generally found, however, even in the densest portion of a negative, a few grains of silver which have not been affected by the developer.

It has been stated that the size of the grains may be altered by the developer used. The accuracy of this statement I doubt very much. The collodion plates were developed with iron, while that developer has almost entirely passed out of use with gelatine, and yet the grains remain practically the same size.

The transparencies are as follows:—

No. 1. From a thin portion of a collodion positive made upwards of twenty-five years ago. The grains in this plate are abnormally large.

No. 2. From a similar plate of the same age. The silver on this plate I regard as of a normal size, varying from $\frac{1}{1000}$ to $\frac{1}{4000}$ of an inch.

I do not think it necessary for me to advert to any of the other photo-micrographs of the plates, as they speak for themselves. It is quite evident from them that in the Ilford plates, both Ordinary and Empress and Extra Rapid, the bromide of silver more nearly approaches the state of division of the silver in collodion than in any of the other plates I have examined. This fine subdivision of the silver must render them a long way the best plates for really fine work, and particularly for astro-photographic work where the star discs require to be afterward measured by microscopes to ascertain their actual distance from each other.

W. FORGAN.

LANTERN-SLIDE MAKING AS AN ART.

[Royal Photographic Society.]

WITH the Hon. Secretary must rest the responsibility of inviting me to address you upon the subject which appears on this evening's agenda. I feel myself that some apology is due for bringing before the members of the Royal Photographic Society a subject which, to some, may appear

almost trivial; but probably Mr. Chapman Jones, with his usual forethought, considered that at this time of the year many of you would only just have returned from your annual holiday, and therefore that something of a light and popular nature would be less likely to disagree with your mental digestion than the more ponderous and scientific matter which will, doubtless, form the bulk of your fare during the remainder of the session.

But, in all seriousness, the subject is one which, I venture to think, well deserves the attention of the Society; for, notwithstanding that the making of lantern slides and their exhibition is still sneered at and affected to be despised by a certain section of photographers, the fact remains that this branch of photography has rendered incalculable service, from an educational point of view, in the practical dissemination of technical and artistic knowledge in many spheres altogether outside the realms of photography.

When I first began to consider the subject, after receiving Mr. Jones's request, I thought I might perhaps usefully address to you some observations upon the artistic side of the question, for from that point of view lantern slides are admittedly very often open to adverse criticism; but I am sorry to say that even there the ground has been, to a large extent, cut from my feet by the publication of a valuable communication from Mr. Tulloch on that very point, from which I shall later take the liberty of making a few quotations.

Lantern slides, as I have said, are still looked upon by some photographers with undisguised contempt; these, however, are for the most part the gentlemen who know all about art, though very little of technical photography. A lantern transparency, that is both technically and pictorially good, deserves to rank high among photographic reproduction methods. What printing process exists, may I ask (and if existent, where is the printer?) which can so faithfully render and preserve the beautiful gradation of a perfect negative? And the small image, when projected, will, I think, in many cases favourably compare with the more or less sunken appearance which, in a greater or less degree, is unfortunately common to all our paper printing methods. If perfect lantern slides are rare, the reason may, I think, be found in the fact that comparatively few clever photographers take up slide-making rather than to anything inherent in the method which in itself would be fatal to artistic effect.

A lantern slide, to be perfect, must satisfy the most exacting requirements of two critics—the technician and the artist. I propose, in the first place, to deal with the subject from the latter standpoint. A lantern slide, if entitled to rank as a work of art, must possess pictorial qualities, it must be a picture. If such a position be conceded to a photographic print—a positive on paper—the same concession must be allowed to a positive on glass. If a negative possess pictorial merit, why should a lantern slide produced from it be less entitled to rank as a work of art than a print? The proposition appears to me to be unanswerable. It has been said that a projected lantern slide is simply the result of an optical illusion, vanishing when the operator lowers the gas. Even if this be conceded, it does not appear to weaken the position. A further argument, and one that probably possesses more weight, is that the great magnification to which the slide is subjected upon the screen produces a coarseness of texture, and an altogether different rendering to that shown in the print. This defect, when apparent, is partly the fault of the slide-maker, although the exhibitor may, to some extent, also be to blame. I am aware that many lanternists and lecturers will disagree with me upon this point, but the artistic qualities of many slides are injured, if not destroyed, by showing them upon too large a scale, and, in some instances, by using too powerful a light. In the majority of cases the audience, at all events those seated in the front rows, are a great deal too close to the screen, and the objectionable granularity, which under such circumstances is so noticeable, will be at once modified by increasing the distance between spectator and screen, and sometimes by slightly lowering the light. A really clever lantern-slide maker is, notwithstanding the number who now practise this most interesting branch of photographic work, comparatively speaking, a *rara avis*, and consequently good lantern slides are not too often met with. Slides are under-exposed, development forced, and every good quality sacrificed in order to secure that which is too often an unnatural brilliancy. This is the commonest and most fatal error into which slide-makers, both professional and amateur, fall.

Unfortunately, neither the general, nor, indeed, the photographic public, are very discriminating in their appreciation of the quality of lantern slides, preference being frequently shown for slides which present an undue amount of contrast. As an instance of this, the very worst slide, artistically, and I think also technically, in one of my lecture sets illustrating the scenery of a particular district, almost invariably receives most applause. This want of appreciation is very discouraging to the really conscientious slide-maker, who is thus sorely tempted, for the sake of winning applause, to sacrifice his artistic instincts. The power of the public mind to discriminate between good and bad will, however, doubtless improve in these days, when so much is being done to cultivate the artistic instincts of the people. The slide which is now upon the screen will not, I think, be likely to tempt your applause, for it is a rather glaring example of the undue brilliancy which I wish you to avoid. The next slide is one produced from the same negative, but in which the relative values, I venture to think, are more truly rendered; yet the former slide would, with the majority of audiences, be much more likely to win applause than the one now before you.

There is, I am sorry to say, very often great room for improvement in the quality of commercial lantern slides, for not only do they frequently lack any pretensions to artistic merit, but, from a technical point of view, are also open to criticism. To the almost universal adoption of masks with either square or circular openings the first fault may be traced, but to this point I propose to more specifically address myself later. The cause of defective technique is, perhaps, more difficult to trace, but it would appear to be due in the first place to the employment of unsuitable negatives; and, secondly, to want of care in the working of the process (wet collodion), which is commercially almost universally employed. I trust, in giving expression to an honest criticism of this kind, I shall not wound the susceptibilities of those who are engaged in this class of work, for commercial lantern slides of the very highest quality, both artistically and technically, can be, and are, obtainable. I should perhaps mention that my strictures are more particularly addressed to subjects of an essentially pictorial character, illustrative of scenery at home and abroad; diagrammatic slides leave little to be desired from any point of view. As an instance of what I mean, I may mention that some time ago I required two special slides to make a lecture set illustrating the scenery of North Wales complete. After inspecting the stocks of three leading London houses, all of which, by the way, bore a striking resemblance to each other, albeit that two of the firms in question professed to make their own slides, the slide I am about to show you was the best specimen I could procure. It is a well-known view. A year later I revisited Wales, and was enabled to take another negative, from which I made the next slide. Without being accused of egotism, for I am sure many of you could produce a far more pleasing rendering of the subjects, you will not wonder that, when exhibiting, I show my own slides in preference to the commercial.

In an appeal for more art in slide-making it is impossible to overlook the influence which the quality of commercial slides has upon the question, for it must be remembered that, for the purpose of illustrating lectures throughout the country, commercial slides are far more often used than slides prepared by the lecturer, who is himself a competent photographer.

If it be said that such subjects are often of a topographical character, and do not permit of artistic treatment, I would point out that an artistic photographer should be able to infuse something pictorial into the most topographical subjects. I do not, therefore, hesitate to make the suggestion that slide-manufacturers should give their old negatives, which, in many cases, have done them good service in the past, a well-earned repose, and intrust their replacement to photographers possessing not only technical but also artistic ability. The firm who takes a lead in this direction will, I am sure, reap a substantial pecuniary reward.

The question, "What process yields the finest results?" is a difficult, if not impossible, one to answer. The question has always been a vexed one, and is likely to remain so. I cannot do better on this point than repeat what I have already said in another place: "For myself I incline to the opinion that, although some processes may lend themselves more readily to the slide-maker's particular requirements than others, there is not one among them that can be called 'best.' A great deal more depends upon the man and his method of working than upon the process he employs. Some photographers declare that wet-collodion slides cannot be equalled; others, again, pin their faith to collodio-bromide, whilst very old workers shake their heads, and assure their younger brethren that a really perfect slide can only be produced by the albumen process. There is truth in each opinion, but it is to be found in the fact that its holder has made the particular process extolled a study, and mastered it in its every detail." JOHN A. HODGES.

(*To be continued.*)

LANTERN SLIDES FROM WEAK NEGATIVES.

SOME time ago I saw in some photographic publication (says Mr. R. D. O. Smith in the *Photographic Times*), not at this moment at hand, a

article upon the above-named subject. The directions were: Make two positives from the negative, superimpose them in a most perfect register attainable, cover with a third glass, and seal.

The lines of one are, therefore, reinforced by the lines of the other, but there is between the images the thickness of a glass, and there are three thicknesses of glass in the slide.

I can discount that plan largely, both as to result and simplicity of method. If the negative is a film, the prints may be made by contact printing. If the negative is on glass, it must be made in the camera or in some apparatus which will ensure parallel rays.

Make a print as usual; then turn the negative over, and make another. Thus you have two prints from the same negative, but one is right-hand and the other is left-hand. When placed face to face, they will register perfectly, with no space between, and each glass is a cover for the other.

By far the finest slides I have made recently were made on Carbutt's process plates. Possibly they are made with the same emulsions used for regular lantern plates, but it seems to me they are superior. I have also made some very handsome slides on Carbutt cut films. I was fearful they would not stand the heat of the lantern, but I now think there is not likely to be any trouble from that source during the short time the slide usually remains in the lantern. I have not yet experimented sufficiently to determine that point, but I do not look for trouble. If slides can be made on thick films, there will be all the gain that attends the use of films for negatives, viz., lightness, compactness, avoidance of danger of breakage, and, to a very large degree, danger of damage from contact. Film slides would very largely avoid the necessity for cover glasses.

THE STEREO-PHOTO-DUPLICON.

JONATHAN FALLOWFIELD, 146, CHARING CROSS-ROAD, W.C.

THE Stereo-photo-duplicon is the name of a piece of apparatus introduced by Mr. Fallowfield, which enables a binocular photograph to be taken by means of a camera carrying only one lens.

Reference to fig. 1 will make clear the fact that the instrument is based upon the principle of double reflection—two sets of inclined mirrors

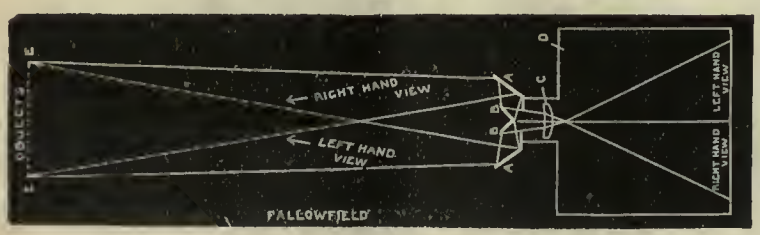


FIG. 1.

transmitting the two images of the view or object photographed through the lens, and, as it is pointed out, in such relative positions that, when prints come to be made from the negatives, cutting and transposition are obviated.

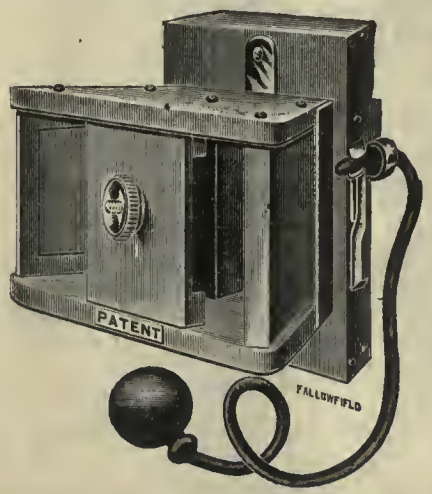


FIG. 2.

Fig. 2 gives a front view of the instrument, which is fitted with a time and instantaneous shutter, and figs. 3 and 4 show how it is affixed to either a hand or stand camera.



FIG. 3.

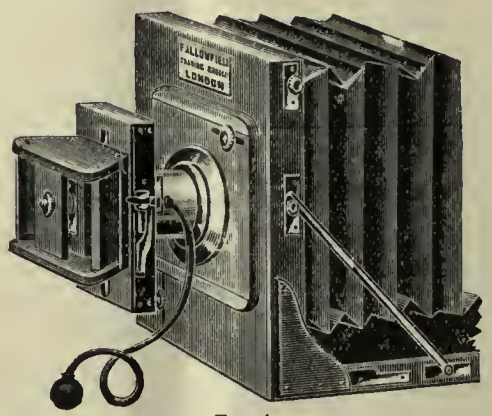


FIG. 4.

It is a very simple and effective way of making stereoscopic pictures by means of a single lens, and we are not surprised to be told by Mr. Fallowfield that a large sale is expected for the Stereo-photo-duplicon.

IMPROVEMENTS IN MAGAZINE STEREOSCOPES.

MESSRS. BRIGGS & MASTERS state, in regard to their invention, that the chief object is to improve the construction and arrangement of parts so that the slides or pictures can be changed much more quickly and conveniently than at present.

"In carrying our improvements into effect, we fit any desired number of stereoscopic or other slides or pictures in a drawer or receptacle provided with grooves or divisions, which separate the slides. This drawer, full of slides, is placed upon a movable carriage mounted in the stereoscope in such manner that by moving a lever or handle and thereby actuating sliding rods or equivalent mechanism, one of the slides of the series in the drawer is raised and brought into the correct position to be viewed through the lenses or lens. When it is desired to change the slide, the lever or handle is moved back, by which means the slide descends into the drawer, and then the sliding carriage with the drawer is moved forward sufficiently to bring the next slide into position, so that, by again moving the lever or handle, the next slide is raised into the correct position for being viewed.

"After all or any required number of the slides have been viewed, the drawer can be drawn back in any convenient manner, and a new drawer full of slides substituted."

THE *Alliance Record* thus refers to the lantern-slide work of Mr. Alfred Underhill, the well-known lantern-slide artist of Croydon: "New pictures for the mission.—A small but very fine collection of lantern pictures has just been received from the studio of Mr. Alfred Underhill, the eminent lantern artist of Croydon, England, by whom they have been specially painted to the order of the Hon. Conductor of the Picture and Lantern Mission. Several of the slides illustrate the evils of the liquor traffic in a very graphic manner. Another, which will in future form the 'trade mark' of the mission, has for a centre piece, the well-known emblem of the Victorian Alliance (designed by Mr. John Vale), surrounded by an elegant typographical border by Mr. A. Dunn, and painted in Mr. Underhill's best style. Some very fine scenic views and a few humorous pictures complete a collection which reflects great credit on the artist, whose assistance will, no doubt, be again secured when further additions to the stock of lantern pictures are to be made."

THE Southport Social Photographic Club announces the following interesting members' competitions:—1. June 10, Cloud "printing in." 2. July 1, Pleasure boats, shipping, &c., in the Channel, Southport. 3. August 19, Southport street scenes (*not views of streets*). 4. September 2, Film photography. Other societies might possibly derive a useful hint from this interesting programme.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*July* 3, 1896.

THE LANTERN RECORD.

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LANTERN MEMS.

There are problems in photographic science as there are in mathematics. I am led to this conclusion by a pertinent question, asked of a friend of mine, regarding photographic records of a recent and very popular horse race. He said, "How could it be explained that one operator managed to get animated picture photographs of the finish of the race with appreciable brilliancy, notwithstanding the film was travelling at a considerable rate, and exposures were being made at eighty to ninety a second, when a hand camera, working at full aperture and giving an exposure of one tenth of a second, only produced an under-exposed negative?" In fact, the exposure was so long that the movement of the horses had multiplied their legs on the sensitive film, which was of a rapid kind, the light at the time being anything but good.

* * * * *

I have no interest whatever in any apparatus for taking or projecting animated photographs; but, if photographs have been shown as *this* year's race, with a certain horse said to be winning, that could not be authenticated, then it is great business smartness to advertise them as such. Probably one horse race is very similar to another where the finish is close, but it does not do to include in a picture, where the record is photographic, a number of horses different to the one it is supposed to represent, or with the field so placed that they do not correspond to a description of the event as seen by sporting critics. It would certainly be interesting for some representative sporting paper to verify this, and set the matter at rest.

* * * * *

The library of the Patent Office is always interesting, not only for the periodicals and books available, but by reason of the distinctive type of "readers." Some good heads are seen, and, as a rare occurrence, a fussy man talking somewhat loudly to himself or companion in total disregard of the recognised silence that prevails. Ladies do not look upon it as sacred ground, for on a recent visit some were working independently in searching out specifications, and others helping the sterner sex.

* * * * *

As some of the complete specifications I wished to look closely into were out of print, the only course open to me was to see the originals, filed in the library, and one of these was that of "W. C. Crofts and another," who in 1889 patented an apparatus for "Improvements in the production and representation of instantaneous Photographic Pictures." To give some idea of the detail gone into, no less than five sheets of illustrations had been made to disclose the invention, and for explanation of the drawings alone five pages of description are given. As the "another" referred to was a barrister-at-law, perhaps this may be an explanation of it; but it is certainly in strong contrast to Mr. Birt Acres' specification, which is a fair specimen of brevity with clearness.

* * * * *

I only hope, for his sake, that the covering power of his patent is good, and he can protect his invention; but to read those already published, and to conjecture from the results on the screen of those provisionally protected, and not yet made public by specification, if any question arises in law, there will be some nice points for the Judges to decide and the counsel and experts to argue and explain. These improved apparatus are developments, and it is difficult to say where the validity of a patent comes in. In those specifications I looked through—viz, Croft's, Acres', and Lumière's—they all are wise enough to describe their inventions as "improvements" or "improved apparatus." Mr. Friese Greene, who was early in the field in this direction, abandoned his patent, provisionally protected in 1892, while Mr. Paul's is not yet completed. I understand, however, by some correspondence that recently appeared, that Mr. Friese Greene has still a patent dated 1893.

* * * * *

If, as current rumour has it, the latter is netting about 120*l.* a week for the use of his apparatus in the various places of entertainments in London alone, it shows how it pays to be early in the field with anything that "catches on" with the public. Where such large interests are at stake, it seems to me only fair to other inventors that a disclosure should be made of the details of the apparatus for which protection is sought—in other words, a complete specification filed, for by the patent law, as I read it, no damages can be claimed for infringement during the time an invention is only provisionally protected. On the other hand, a prior inventor of an apparatus that produces the same result ought to be in a position to ascertain if the later production is an improvement, or only a colourable imitation.

* * * * *

The patent law is so very uncertain, and the cost of testing the validity of patents so great, that business men hesitate to move, and it wants a Crœsus or big company to set the machinery of the law in motion and be prepared to pay the piper. What the Welsbach incandescent gas burner trial must have cost is a matter of conjecture at present, but will, doubtless, be known some day. It can be imagined from the cost of a trial respecting the alleged infringement of a special kind of eyeglasses known as the spiral spring pince-nez, which, after a trial in Scotland, then an appeal, and afterwards being taken to the House of Lords, cost over four thousand pounds, and the decision at last went against the introducer in England of the eyeglasses, and consequently in favour of the defendants as to alleged infringement, for they were able to prove

prior publication in England of an article similar in principle, and closely alike in practical application to that which was the subject of a patent.

* * * * *

As to how many of the hundred-and-one patents for lantern and photographic apparatus annually granted would stand the test of trial it is difficult to say, but I have heard it put as low as one per cent. Certain it is that agents, if they were candid with inventors, would tell them that very few patents are worth anything *as patents* until after they have stood a trial, and the majority taken out do not pay the inventors the cost of the patent and agent's fees, drawings, &c. There is no one so sanguine as an inventor, and a "candid friend," who suggests the possibility of the improvement being *no* improvement, or not likely to be a commercial success, would be thought to have interested motives in saying it, or else lamentably deficient in the proper appreciation of genius.

* * * * *

As to priority for the publication of apparatus for producing animated photographs—not including Muybridge and Anschutz, who seemed to confine themselves to men, animals, birds, &c., in motion, without any attempt at scenes, I see the first is W. C. Croft and Wordsworth Donisthorpe, August, 1889; second, Friese Greene, 1892; third, Lumière Brothers, April 8, 1895; fourth, Birt Acres, May 27, 1895, and Paul, October and November, 1895. It is, I think, only fair to Mr. Acres to state that in the spring of 1895 he photographed the Oxford and Cambridge boat race and the race for the Derby, this being the first time any natural events were attempted, and he showed them in public on January 12, 1896, while they were privately shown as early as September, 1895.

* * * * *

With Midsummer Day past, and cycling, and X ray photography in full swing, there is not much to say on orthodox lantern matters, but, no doubt, the slide-producers are busy getting negatives for new sets of slides, while apparatus-makers are cudgelling their brains for lantern novelties, and an enterprising business man in the lantern way has acquired the plant and premises of gas compression works, and will shortly be able to supply gas. As competition is said to be healthy and promote trade, we shall see what our old friends of the oxygen gas companies have to say and do as regards this. I like to know what is going on, and, as I have had an invitation to look over the works, I shall take an opportunity of doing so, and see if there is anything I can say about it that is of interest to lanternists generally.

G. R. Baker.

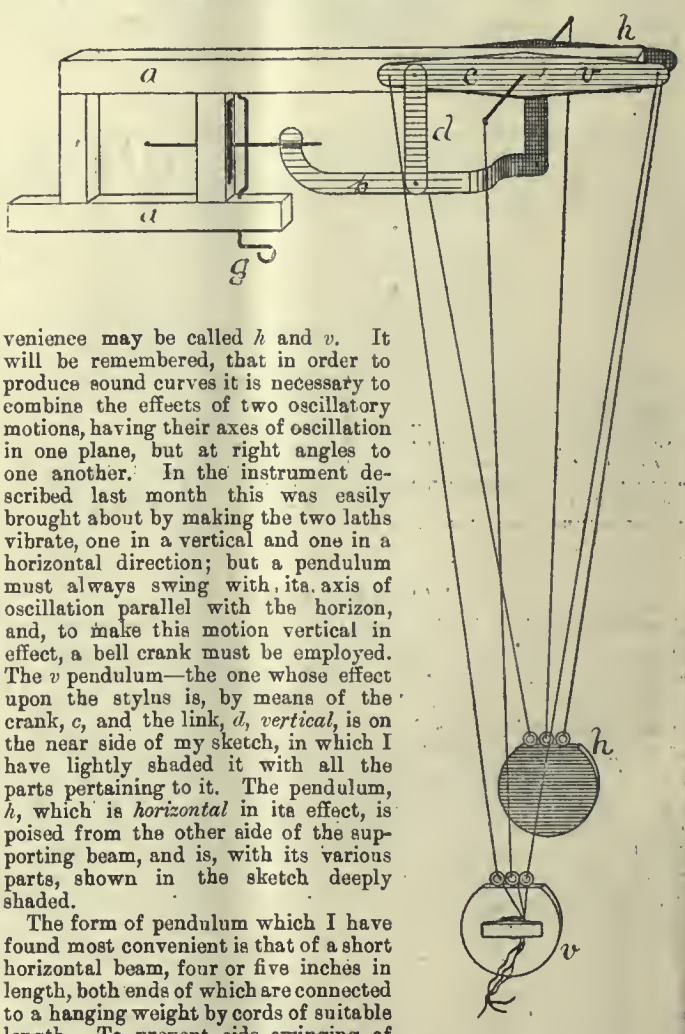
SOUND CURVES WITH A LANTERN.

II.

The apparatus described last month, for projecting upon a screen the beautiful curves resulting from two vibrating rods has this disadvantage as an instrument of education. Its effects are not permanent, and they are not cumulative—two results which militate against any careful study of the phenomena. Of course, it goes without saying that the curves so produced are not shown with anything approaching the frequency with which they would be formed by bodies vibrating fast enough to produce sounds appreciable by the human ear. To appreciate the movements of an elaborate piece of mechanism—say a steam engine, one must watch it when it is running at low speed, but, to really understand the reasons for its various motions, it should be studied carefully when the steam is shut off, and it can be put through its paces very slowly indeed, by hand. It is the same with these sound curves; to really comprehend the lesson which they are capable of teaching, they should be made to form very slowly, and when once formed they should not immediately fade, but should remain for comparison with the figure formed by the successive oscillations.

Such a result may be brought about by employing a compound pendulum in place of two vibrating rods, used in connexion with some device for recording its movements above a sheet of paper, such as a pin, or a small box depositing a trail of sand, but obviously such an arrangement as this is not applicable to an ordinary optical lantern, or, indeed, to a lantern of any kind. However, two pendulums, swinging independently of one another but each acting upon one stylus which traverses a piece of lamp-blacked glass, will do all that is required, and do it well, and, as will be seen, the combination can be used in conjunction with an ordinary lantern.

In the diagram, *a* represents that portion of the apparatus which is placed in the slide stage of the lantern, and which carries the square of blackened glass to be operated upon by the stylus carried at the end of the arm, *b*. The upper beam of the "carrier" portion is prolonged to form a support for the two pendulums, which for convenience may be called *h* and *v*. It will be remembered, that in order to produce sound curves it is necessary to combine the effects of two oscillatory motions, having their axes of oscillation in one plane, but at right angles to one another. In the instrument described last month this was easily brought about by making the two laths vibrate, one in a vertical and one in a horizontal direction; but a pendulum must always swing with its axis of oscillation parallel with the horizon, and, to make this motion vertical in effect, a bell crank must be employed. The *v* pendulum—the one whose effect upon the stylus is, by means of the crank, *c*, and the link, *d*, *vertical*, is on the near side of my sketch, in which I have lightly shaded it with all the parts pertaining to it. The pendulum, *h*, which is *horizontal* in its effect, is poised from the other side of the supporting beam, and is, with its various parts, shown in the sketch deeply shaded.



The form of pendulum which I have found most convenient is that of a short horizontal beam, four or five inches in length, both ends of which are connected to a hanging weight by cords of suitable length. To prevent side swinging of the two pendulums, which are, of necessity, hung very near one another, and which would therefore be very likely to collide, a third cord from each weight may be connected to either end of a transverse beam in a line with their two centres. This will have the effect of confining the oscillations of the pendulums each to its own plane, which planes will be parallel to one another. Moreover, the distance between the weights can be increased to any reasonable extent, and the risk of collision between them reduced to a minimum.

One of the pendulums must be variable in length, just as was one of the vibrating laths, in order to get the different effects which are produced by a difference in their periods. This variability may be brought about by passing the three cords of one pendulum through the three eyelet holes of the weight, and thence round a cleat provided on one of its faces, or a finer adjustment may be obtained by substituting a violin or banjo peg for the cleat, and then the pendulum may be tuned just as a stringed instrument would be. Of course, the other pendulum may have a fixed length—it is only necessary to tune one. Both, however, should be considerably longer in proportion than in my sketch, in which, to suit the exigencies of space, "I've been obliged to draw them small."

There is no necessity to employ a mechanical arrangement to keep the pendulums swinging. If they are long, and their weights heavy, and if all the links and motions used to combine their actions and cause them to describe the resulting curves upon the blackened glass be so arranged that there is only the least possible friction—and this is most important—the amplitude will only diminish very

gradually as the complicated curve is slowly formed, and indeed I think the gradual loss of amplitude adds considerably to the beauty of the resulting figure.

Referring again to the diagram, *g* is a piece of bent wire which serves the purpose of preventing the stylus from coming in contact with the lamp-blacked glass while the pendulums are being started. The method of using the whole instrument, will now hardly need any explanation, but here is a rough outline of the *modus operandi*.

First place the instrument in the lantern, and see that the pendulums swing properly and quite clear of one another. Then with very great care, the stylus being held out of harm's way by the bent wire, G, place in position the piece of previously prepared glass, which has been blackened by holding it for a short time over a smoking lamp, and then the light in the lantern may be turned on, for none of it can now reach the sheet. Set the pendulums to *almost* equal length, and gently and carefully start them both swinging. At the moment when they are "in phase"—starting and finishing their swings at the same time—turn the little handle, *g*, so that the stylus is free to act upon the blackened glass, and a streak of light will shoot across the sheet from corner to corner in an almost perfectly straight line. At the next swing the line of light will be doubled upon itself, although it will not follow exactly the same path; at the next it will diverge still more, and the straight line will be seen to be developing into an oval, which will become fatter and fatter until, when one pendulum has gained half a swing upon the other, it will have become a true circle. Then, again, it will take an elliptical path, though the ellipse will be smaller than before, owing to the loss of amplitude, and its greatest length will be at right angles to the former oval. If the pendulums have sufficient energy left—and they certainly should have—they may be allowed to swing until the stylus again traverses the straight line it originally made. The operation may then, with advantage, be terminated. One cycle of changes will have been completed. Speaking musically, the figure upon the screen is the graphic history of a single "beat," produced by the interference between two sounding bodies which are almost, but not quite, in unison.

The octave, the fifth, and all the other musical intervals may be made to tell their tale in the same manner, and the discords compelled to leave permanent records of their writhing contortions, but it is not necessary to give any further description of the manner of doing it.

CECIL M. HEPWORTH.

LANTERN-SLIDE MAKING AS AN ART.*

THE qualities to be looked for in lantern-slide making processes are: fineness of deposit, freedom from granularity, absence of any tendency to fog, transparency, and good colour. Both the albumen and the collodio-bromide processes possess all these attributes in a high degree. The former process, notwithstanding the beauty of the slides produced by it, is by no means an easy one to master; moreover, its slowness precludes the possibility of making the slides by reduction, and restricts the user to contact printing. Collodio-bromide in capable hands produces results which, if not superior, are certainly equal to those produced by any rival method, but the preparation of the emulsion is an art which comparatively few have fully mastered, and those who have done so deserve high praise for their skill.

Wet collodion, though capable of producing fine results, requires skilful handling, for probably no process so readily lends itself to the production of bad slides. That it is almost exclusively employed by commercial slide-makers must be attributed to the fact that it is cheaper, more expeditious, and possibly also more certain than other methods, rather than to the superiority of the results produced by it.

The carbon process is simple, yields beautiful slides, and gives the slide-maker, with an eye to artistic effect, a fine command of colour; but, with most tissues, a stronger negative than is desirable for general purposes is necessary in order to obtain sufficient vigour in the slides; and this reason, coupled with the fact that the slides can only be produced by contact, probably accounts for the process not being more frequently employed.

In discussing the relative merits of processes applicable to lantern-slide making, the question of contact printing *versus* reduction is naturally involved. It is still, I believe, the popular opinion that slides made by contact are inferior to those produced by reduction. I at one time held the same view, and formerly made all my slides in the camera irrespective of the size of the negatives; but, after some carefully conducted experiments in which slides were produced by each method from the same negative and compared, I have come to the conclusion that, so far as technique is concerned, one method presents no advantage over the other. The two slides I now show you were produced, the one by contact the other by reduction, from a $3\frac{1}{4} \times 3\frac{1}{4}$ negative, and, in regard to quality, it would be difficult to detect any difference between them. Pictorially considered, very different considerations, however, arise, and printing by contact from even a quarter-plate negative may, by altering the original composition, entirely destroy the artistic qualities which the slide would, if made by reduction, have possessed. The converse, however, in some cases, also holds good, and a negative originally defective in composition may be considerably improved by utilising a portion only for the slide. The following slides will perhaps illustrate my meaning. This slide, which was reduced from a quarter-plate negative, I venture to think, is of fair artistic merit, and does not sin in any very marked degree against the ordinary canons of pictorial art. The same, however, can scarcely be said of the next slide, which was made by contact from the same negative. These two slides are a practical illustration of the loss of quality which may ensue when contact printing from negatives larger than the slides is resorted to. The next slides, however, prove that this is not an invariable rule, and demonstrate that, in some cases, where the original composition is defective, a positive gain may result from the exclusion of unnecessary subject matter. It will be seen, therefore, that, from an artistic point of view, the question is one upon which no arbitrary opinion can be given. Neither method can be said to possess superiority. In some cases the slide-making process chosen will decide the matter for us, but, where the process permits of either method being adopted, good taste will alone enable us to decide which will enable us to obtain the best result from a given negative.

It is not possible, in the time at my disposal, to give more than a cursory glance at the various processes employed in slide-making; but I cannot conclude even this brief reference without a word or two upon the gelatino-bromide process, which, amongst amateurs at any rate, is now the most popular of all. This process, with which even the youngest worker is familiar, will yield under suitable treatment slides which, from a technical point of view, will be, if not superior, at least equal, to any produced by the older and more highly extolled methods. This opinion, not hastily arrived at, nor based solely upon my own work, but formed after a critical examination and comparison of the best representative work of others, will not, I am aware, be shared by you all; it is probably one of those points upon which no amount of argument will carry conviction. Some photographers, in a good old conservative spirit very refreshing in these regenerate and radical days, still refuse to believe that perfection in a lantern slide is possible of attainment, unless its production be associated with either the albumen or the dry-collodion process; but, as I have already said elsewhere, they belong to a class which still affects to regard the gelatine process as a retrogression rather than an advance. Gelatine, I must admit, is probably responsible for more bad slides than any other process. Those of you who are in the habit of attending Society Lantern Evenings are, doubtless, only too well acquainted with the frightful examples of "how not to do it" which are always to be met with upon such occasions. Such undesirable results are, however, in no way attributable to, or inherent in, the process, but are solely due to lack of skill upon the part of those who work it. One great advantage of the gelatine process is its rapidity, combined with the enormous range of colour obtainable, ranging from black to yellow—a very important point, as I have already said, to the artistically minded slide-maker.

Commercial lantern plates vary greatly in quality, some being very much better adapted to their purpose than others. I cannot here, of course, make specific reference to particular brands, but the observant worker should have but little difficulty in making a wise selection. Freedom from granularity is one of the most important attributes of a lantern-slide emulsion, and, given a suitable exposure and system of development (upon which, of course, to a large extent, the physical condition of the image will depend), the plate showing least granularity will make the best slide. Great rapidity is inimical to the obtainment of these conditions; therefore, as a rule, rapid lantern plates should be avoided, though it is only fair to add that there are some such plates in the market capable of giving fine results. For reducing, a plate containing bromide of silver is almost a necessity; but, for contact work, a plain chloride plate may be used with advantage. The latter plates—for some reason not easy of solution—have never met with the popularity they deserve. Possibly their indifferent keeping qualities may have had something to do with this want of popularity; at any rate, when freshly prepared and skilfully developed, slides may be produced upon them possessing all the fine qualities usually associated with the albumen process.

* Concluded from page 47.

Given a good plate, the excellence, or otherwise, of the result obtainable upon it depends to a very considerable extent upon the mode in which it is developed. In this respect commercial lantern plates vary very much, and treatment that would produce a successful result with one brand might, from a critical point of view, altogether fail with another. I do not advise adhering too rigidly to makers' formulæ; and in very many instances solutions far too strong are recommended, and better results will often be obtained by diluting the developer. The attributes which constitute perfection in a lantern slide may be summed up as follows:—Its colour, whether warm or cold, must be pure, and not dirty or degraded; the range of gradation must be as perfect as possible from high light to deep shadow, but the latter must always be luminous, never opaque, and free from granularity; nor must there be the slightest degradation or veiling of the high lights. In this latter respect, collodion, both wet and dry, has a marked advantage over gelatine, for, try as one may, it is impossible to stain a collodion film, whilst a gelatine one is very prone to this defect unless steps are taken to avoid it. Almost any developer employed for negative work may be used for the development of gelatine lantern plates, though some are more suitable for the purpose than others. It is impossible to weigh the *pros* and *cons* of the legion of developers that now exist. For warm tones I am of opinion that pyro, if it be properly used, is still unrivalled. Many published formulæ give too large a proportion of pyro, and do not contain sufficient sulphite to prevent a slight staining of the film, when, as is often the case, development is protracted. With the following modified pyro developer, and giving what, with a more normal strength of solution, would be a very full exposure, I find it is possible to obtain a rich, warm, brown-coloured slide, possessing in a high degree those technical qualities to which I have adverted:—

Sulphite of soda	240 grains.
Distilled water	35 ounces.
Citric acid	30 grains.
Pyro	40 ,,

To use, take two ounces of above, adding from 30 to 40 minims of ten per cent. soluble bromide of potash, 40 to 60 minims of ten per cent. ammonia, and, for very warm tones, 20 to 30 minims of ten per cent. carbonate of ammonia.

The colour of a lantern slide is very much a matter of taste. I confess myself to a preference for a warm colour whenever the nature of the subject permits. Good taste here is the only reliable guide. A warm brown will suit most subjects—landscapes, interiors, or figures; but a winter scene, particularly if snow or frost is depicted, would obviously demand a cool grey or black. One does, however, even now occasionally meet with such an anachronism as an ice-bound river portrayed in ruddy brown, as, for example, in the slide now upon the screen; when the same view is presented to you in cool grey, I think I shall have sufficiently emphasised my point. Let us take another illustration. Although black is a safe colour in which to render almost any subject, and there may be nothing objectionable in so portraying such a subject as the north door of Calder Abbey, yet those who have visited that beautiful ruin know that its principal charm lies in the rich warm red sandstone of which it is built, and will consequently prefer the subject treated in the way I now show you, though, technically, and apart from colour, the slides are, I think, of equal merit. From a purely technical point of view, there is much to be said in favour of warm-coloured slides, for we know that the conditions which are essential to their attainment —*i.e.*, full exposure and a restrained development, with a weak developer —tend to the production of a fine deposit and freedom from granularity, the ultimate result being a finer and more delicate slide.

Hydroquinone is perhaps the most popular of all developers for lantern transparency work, probably chiefly on account of its non-staining properties. But a cleanly developer, which does not stain the hands, is not the only desideratum for which to look, and in unskilful hands hydroquinone is apt to give results which are very bad indeed. It is true that a wide range of colours can be obtained with it, but its use should be restricted to the production of warm colours, for with many commercial plates, if blacks or greys are aimed at, far better results, both in purity and tonality, will be obtained with ferrous oxalate. Although one of the caustic alkalies is generally recommended as the accelerator in formulæ for transparency work, I much prefer carbonate of soda, which seems to work more evenly, and possesses several advantages. With hydroquinone there is, at any rate in my hands, a decidedly greater tendency to block or clog in the shadows than is the case with pyro, a difficulty which it is not always possible to successfully overcome by dilution of the developer. These I consider to be the chief failing of hydroquinone as a developer for lantern slides. These are examples of slides developed with hydroquinone.

Eikonogen, either alone or in conjunction with hydroquinone, produces good results on some plates; and, in parenthesis I would say, a plate should not be condemned because with a particular method of development it does not give just the result desired, for a different treatment may result in the production of the finest possible slides. The next two slides were developed with eikonogen.

Metol and amidol have found favour with some workers for lantern-slide work. I have had but limited experience with the former; the latter, amidol, produces blacks of very great purity, and has little tendency to block or clog the shadows, but with most plates it is necessary to push development rather far in order to get sufficient density. It is an excellent developer for this reason when slides have to be produced from very dense negatives.

I am reminded by this allusion to negatives that I have not yet referred to this very important branch of the subject. The excellence of the slide will, of course, depend primarily upon the quality pictorially and technically of the negative from which it is made. Although much may be done in the way of improvement by skilful manipulation, I need hardly say that, although it may not be impossible to get good slides from bad negatives, it is certainly a difficult matter, and it is equally certain that the best slides will only be producible from perfect negatives. There is at the present time a tendency to produce thin, soft, weak negatives, probably brought about by the general adoption of gelatino-chloride paper, a degenerate tendency which, if carried to extremes, is not likely to improve the status of photography from any point of view. Such a type of negative is unsuitable for the best transparency work. A good plucky negative, with a full range of gradation, not so dense that the high lights will not show printable detail, nor so clear that the shadows are devoid of detail, will be found to give the best results. In both taking and making the negative, we cannot be too careful, for, from both a pictorial and technical point of view, defects that would perchance pass unnoticed in a paper print, will become glaringly obtrusive when magnified many diameters and projected upon the screen.

Whilst dealing with this part of the subject, I should like to say a few words upon proportion, because it has a most important bearing upon it from a pictorial point of view. In showing views of different kinds of subjects, more attention should be given to their relative sizes, and care should be taken to avoid as far as possible exaggerating the natural relative proportions of the various objects depicted. For example, it seems almost absurd to show some flowers from a bush of syringa magnified to the dimensions of prize cabbages, whereas we know that each blossom is little more than an inch in diameter, and where possibly the very next slide may be a figure study in which the figure is represented as being very much less than life size, which in its turn may be followed by a child of Brobdignagian proportions.

One word upon a matter which seriously affects lantern-slide makers. I refer to the judging of slides at open competitions. Medals are usually offered for pictures and for lantern slides, but there is no doubt that in selecting Judges regard is almost always had to the pictures and not to the slides, the result being that gentlemen are frequently appointed who, though eminently qualified to judge of the merits or demerits of the former, take but little interest in the latter, the result sometimes being that at the last moment the slides are judged hurriedly, and in an almost perfunctory manner. I would suggest, for the consideration of the promoters of Exhibitions, whether it would not be to their own interest, as well as in the interests of lantern-slide making as an art, that some one recognised as an expert in this branch of photography should be entrusted with a task which is certainly as difficult as that of judging of the merits of photographs on paper.

I have reserved the mounting of the slide for my concluding remarks, but it is by no means the least important aspect of the subject. Although a few clever amateur slide-makers fully recognise the importance of paying attention to this part of the preparation of the slide, it is astonishing how little regard is paid to it, not only by the general run of amateurs, but also, I regret to say, by the majority of professional lantern-slide makers. It must be apparent to the most superficial observer that the shape of the mask of a lantern picture will as much influence its effect upon the screen as would the mount or frame of a paper positive. Very conservative notions appear to prevail in commercial slide-making circles, and squares, circles, domes, and cushions are still the ruling shapes, the prevailing idea being, apparently, to include as much as possible of the subject upon the area at command. $3\frac{1}{4} \times 3\frac{1}{4}$ has now become the recognised standard size for lantern slides in this country, and it is, upon the whole, a most convenient size; but

that we should be limited to ugly squares and circles in our commercial slides passes my comprehension. I think, if those who cater for our wants in this direction were to give their customers the option of oblong openings, a mutual gain would result. The picture now upon the screen is the production of a well-known firm of slide-makers; technically it is a good slide, but pictorially it is entirely spoilt by its inartistic mount. To emphasise my point, when I take the liberty of substituting an oblong mask for the unsightly square one, the improvement from a pictorial point of view will be manifest.

No rules can be laid down for the guidance of the slide-maker in the selection of suitable masks, the matter is essentially one for the individual exercise of good taste and judgment. Squares, circles, domes, and ovals will rarely be found suitable, though each may in exceptional circumstances produce the effect desired. Eccentricity of any kind should be avoided, oblong openings will be found to best suit the majority of subjects. The incongruity and bad taste of fancy shapes, such, for example, as that now upon the screen, will be obvious to you all, though the fact that such masks are commercially obtainable would appear to indicate that a demand (let us hope a small one) exists for them.

The shape which sins most against the artistic is the oval. It is, at any rate in a lantern slide, but rarely to be tolerated. It may be said that it serves a useful purpose in cutting off an uninteresting foreground, but where its employment for this reason would seem to be indicated a more pleasing effect will often be produced by vignetting. The practice of vignetting has been very strongly condemned, but in some cases a very pleasing and artistic effect, difficult to obtain in any other way, may be secured.

Mr. Tulloch, in the paper to which I have already referred, advocates printing lantern slides with a white margin, and his remarks upon the subject are so telling that I take the liberty of quoting them:—

"Everybody, I presume, understands the meaning of tone values. Briefly, it means the degree of black, say, which must be used to represent different colours in a composition. Say that a drawing has to be made in black chalk, or pencil, of such a subject as a plate of fruit, consisting perhaps of lemons, green grapes, and black or blue grapes. How dark must these various objects be to roughly represent the intensity of colour carried to the eye from the lemon and the two kinds of grapes. None of them will be white, of course, and, assuming that the lemon will be the lightest, it will yet be darker than pure white, the green grapes will be slightly darker than the lemon, and the black grapes darker still. These and the tone value, and this is what I am driving at. A white margin will show that the lemon was not white, but a pale tint less luminous than white; from the value of the lemon you can determine the value of the grapes. Suppose, now, we remove the white margin. What happens? You have lost the key to the tone values. . . . . All must have noticed how very frequently sunshine effects are mistaken for snow scenes when shown upon the screen. Dust on the road looks like snow, sunlight on the leaves looks the same. Why is this? No doubt some of the pictures are bad, but not all such. The road is not absolutely white, neither the high lights upon the leaves; but, having no absolute white wherewith to judge, they *seem* to be white, and hence the snow effect."

With every word of Mr. Tulloch's in this connexion, I most cordially agree, and, although I cannot show you the actual slides to which his remarks refer, the next two slides, which I have somewhat hastily prepared, will, I think, demonstrate the truth of his remarks.

I need scarcely point out what an important influence upon the pictorial effect of a lantern slide the introduction of a suitable sky has in those cases where, in its absence, there would be an expanse, more or less large, of blank, white screen. Many photographers who would not dream of letting a paper print go forth without a sky never attempt to introduce one into a lantern slide. The difficulty, however, of double printing is really no greater, indeed, I think it is less, in the case of a slide than a print, and may be reduced to a minimum by printing sky and landscape on separate plates. When this last method is resorted to, care must be taken to secure a similar colour in both landscape and sky A word of warning whilst upon the subject of skies. At the present time moonlight effects, so called, generally produced by and against the light exposure at or near sundown, are very popular with the public, and when exhibited generally elicit applause. Many, indeed the majority of, such effects are grossly untrue to nature, the tonality altogether false, the "catchy" effect being due to an excessive contrast of light and shadow, as offensive to a trained eye as it is false to nature. The high lights in such pictures are often far too brilliant and devoid of tone, and the dark clouds with which they are contrasted are far blacker and denser than any clouds ever are in nature. Let those who are fond of such effects (and, when rendered with some approximation to truth, more beautiful subjects for lantern slides could not be found) not forget that cloud forms, however heavy in themselves, are but vaporous masses, and in their most thunderous and forbidding aspects, always luminous. The caution being given, the evil may be easily avoided, both in the development of the negative and of the slide by following the golden rule, "Keep the shadows luminous and avoid undue opacity." I will now show you one or two examples of difference in rendering of the same subject, as a practical illustration of my remarks.

I have now completed, though, I fear, in a very inadequate manner, the task which has been allotted to me. I cannot say that I regret that the opportunity has been afforded me of putting my views upon the subject in a concrete form before you, though, doubtless, abler hands than mine might have been intrusted with the task, for the subject is one in which I take the keenest possible interest. Slide-making and the use of the optical lantern have always been a pet hobby of mine, and I am glad of the opportunity of endeavouring, however feeble may be the attempt, to raise the status of a branch of photography than which I believe none other has a greater educational value. Where a positive on paper may be seen and admired by dozens, the same picture, when projected upon the screen, can be seen and admired by hundreds. Where the one imparts its lesson to the few, the other instructs the many; therefore of a lantern slide it may be truly said, "It gives the greatest pleasure to the largest number." I do not profess to teach you a process. There are many here who are far abler exponents of the different processes applicable to the production of lantern slides than myself, by whom practical information will be ungrudgingly given. JOHN A. HODGES.

THE MAXWELL THEORY OF LIGHT.

[Photographisches Archiv.]

THERE was once an island, and all its inhabitants were blind. It had no means of communication with the rest of the world. None of its inhabitants had ever heard anything about the eye.

Nevertheless, there were many things they knew concerning light, as their other senses were well developed, and from time to time they felt round about them, that it was uniformly warmer. They were aware of this by touch, and they knew it was here, and that it was not there. It could be distinctly felt, and consequently it must be something material.

Then their learned men drew attention to a remarkable fact, a solid body, placed at some distance from the hand feeling warmth, caused the sensation of heat to disappear; consequently warmth could not be a solid body, it must have some resemblance to a wind proceeding in a straight line from some very distant moving body, because objects placed in its way stopped further progress.

In course of centuries the science of this warm wind became more and more developed. New experiments were constantly being made. Much had been learned from them, and very fine instruments, extremely sensitive to this wind, thermometers, &c., had been constructed. By their means the movement of this distant body, which they called the sun, as well as many other facts, were scientifically established.

But, some centuries ago, great objections had been made to this wind theory. No one had ever succeeded in applying this force as a motive power to an instrument resembling a windmill. On the other hand, however, it had been shown, that there were certain solids, that this force could penetrate. Yet, what it was, nobody knew.

Then somebody invented a theory, and gave it an attractive name, fluidum. Fluidum was something incorporeal. Enthusiastic followers took it up, although none of them could imagine what an incorporeal body could be.

In later years this fluidum theory was followed by another. It was maintained that light, that mysterious power, might resemble sound. The latter also had been thought a fluidum. But, with their delicately sensitive fingers, they had noticed the harmonious vibrations of a plate with music. Even a record of this motion had been made in wax by means of a pointed instrument, and it was thus demonstrated, that sound must be a vibration of the air. Amongst the younger men the sound theory found many followers, but the elder still maintained the fluidum theory, because the younger could not succeed in adducing direct proof, that this other power, known as light, could also produce vibrations.

The younger men sought for experimental proof, and found it in the following manner: By means of a perforated disk, that could be made to rotate, an instrument was constructed, which rendered it possible to project rays of sunlight upon an ebonite plate, and to cut them off in alternation. The ebonite emitted a dull tone. The quicker the disk was rotated, and the quicker the intervals succeeded one another, the higher was the note.

In this way was proof adduced, that sound and the other force were essentially the same. Former explanations were abandoned, and every one adopted the new . . . . .

We will now return to facts.

For light substitute electricity, and for men blind to light, men blind to electricity.

The power of the magnet and electrified bodies to affect others at a distance was noted in early times, and at first a fluid theory was propounded. The progress of optics, however, rendered it necessary to abandon this view. Then Maxwell came, and propounded his electro-magnetic wave theory, to which light waves should also belong. Light should be a manifestation of electricity, and electricity an undulation.

The celebrated experiments of Hertz seemed to prove this theory. He made electric vibrations, which, though enormously larger than those of light, had otherwise all the properties of the latter. They were refrangible, gave interference phenomena, &c. The quicker his oscillator worked, the smaller were the waves. From this it was inferred, that electric colours existed, which differed from one another in the same manner as the colours of light, by their different wave-lengths. Since that time the undulatory theory of radiant electricity, and consequently the electro-magnetic theory of light also, has received increased acknowledgment.

But are these inferences justified?

Our parable narrated how the blind wished to prove by the photophone the sound theory of light; but no educated person, who can see, would believe it, because he knows that these photophone waves consist of a complex of light waves. The more rapidly the light is intercepted, the less will be the number of the actual light waves, of which each photophone wave is composed. But, though the latter are complex, reflection, refraction, and interference may be observed.

It is precisely the same with Hertz's waves.

Nevertheless, it is probable, that electricity is transmitted in an undulatory manner through the air, but Hertz and his followers have not adduced positive proof of this. What they have observed is, waves composed probably of complexes of much smaller waves. These smaller ones may be the actual electric waves.

Until the latter is thoroughly established, optics should not be subordinated unduly to the teachings of electricity. AHRIMAN.

ACETYLENE AND INSURANCE.

AT a recent meeting of the Philadelphia Fire Underwriters' Association, Mr. Charles A. Hexamer gave his views on acetylene gas, viewed from the insurance standpoint:—

"Acetylene gas burns with an exceedingly luminous flame of much greater candle power than the best city gas. If furnished to the consumer through underground pipes in a manner similar to the present system of city gas supply, there would be no greater risk from its use than from the use of city gas. In order to cheapen its use, however, it is proposed to supply acetylene gas to the consumer in cylinders, in a liquefied state, under a pressure variously estimated at 750 to 1000 pounds. It is stated that a cylinder of gas, four inches in diameter, four feet high, will contain enough gas in a liquefied state to supply an ordinary ten-room dwelling with gas for three months. These cylinders it is proposed to connect directly with the gas pipe in a building; when empty, to be disconnected and a new cylinder substituted. It is necessary to reduce the 1000 pounds' pressure in the cylinder to a small fraction of a pound at the burners. This is done by a Pintsch valve, a rather complicated mechanism.

"Two important questions present themselves at this point:—

"(1) What would be the result if a possible fire in the building should reach the acetylene cylinder?

"(2) What would be the result if the reducing valve failed and the entire gas pressure in the cylinder were suddenly thrown into the gas pipes in the building?

"It is stated that, while it is true that an increase of temperature involving the gas cylinder would produce increased pressure, before the pressure would cause a rupture of the cylinder (which is said to be tested to 3000 pounds), decomposition of the acetylene gas into carbon and hydrogen would result, with no explosive effect. This result, it is claimed, has been obtained by heating a small cylinder of liquefied gas in a fire to a cherry-red heat. While this may be true (and similar decomposition of gases—notably hydrogen sulphide, which in a cylinder subjected to heat deposits free sulphur and liberates hydrogen—are known), it remains to be demonstrated whether cylinders of liquefied acetylene gas can safely be heated without disastrous results, the fact being that the quantity of hydrogen liberated equals in volume the acetylene decomposed; the danger of a rupture of the cylinder, therefore, is not eliminated by the decomposition of the acetylene. The result of failure of the reducing valve, which operates automatically, can be easily imagined. The liberating of a gas at nearly 1000 pounds' pressure into gas pipes not intended to carry more than a few pounds' pressure must necessarily produce disastrous results.

"From the above it will seen that the points of interest to the underwriter are the presence of cylinders of liquefied gas in buildings in case of fire, and possible failure of the valve intended to reduce and regulate the slight pressure of gas necessary at the burner. There is no reason why the objection from these points should not be overcome. Cylinders of compressed gas can and should be located outside the building, and a safety valve can be provided to empty the cylinder, discharging the gas into the open air outside of the building, in case the reducing valve fails to act.

"Besides furnishing acetylene in liquefied state under pressure, it is proposed to introduce small gas machines intended to generate acetylene directly from the calcium carbide. Apparently no special hazard attaches to this plan, provided the gas machine be located outside the building, and provided the calcium carbide be stored in a dry place and free from an accidental contact with water, which, generating the gas, might cause a fire or an explosion by coming in contact with an open light.

"It is too early to formulate rules and requirements for safe introduction of acetylene gas for illuminating purposes. The subject has hardly passed the experimental stage. The result of an accident to a cylinder of the compressed gas brought it forcibly to the attention of the underwriter. That the disaster was the result of the accidental and possibly careless breaking of a valve being experimented with cannot be allowed to modify the deduction to be drawn. As an illuminant, acetylene is so far superior to ordinary city gas that, if the claim made as to the relative cheapness of its production can be substantiated, its general introduction may be expected. A careful consideration of the subject by underwriters' associations is necessary. In the mean time, underwriters are wise who carefully consider each application for the use of this new gas in its present state of development, and, until proper regulations and requirements have been formulated for its safe introduction, refuse to grant permission for its use in buildings covered by their policies."

THE VIVISCOPE.

[Scientific American.]

A GREAT deal of ingenuity is devoted to the production of entertainment devices, and many most ingenious ones have been illustrated in our columns, but it is seldom that one more interesting, from the scientific as well as amusement standpoint, can be offered to our readers than the one termed the viviscope. Supported on a standard is a circular stage. Concentric with the stage, a circular block, about eight inches in diameter, is rotated by a hand wheel. This block is surrounded by a cylinder secured immovably to the circular stage. Attached to the disc are two wires projecting nearly radially from it, and carrying at their outer ends a block of crescent shape, and which depends directly over the perimeter of the stationary cylinder. As the hand wheel is rotated, this block whirls around and around the cylinder.

With the viviscope are supplied a number of endless bands of paper with coloured pictures of figures in progressive stages of movement, drawn on the zoetrope principle, the same as is followed in securing the photographs for the kinetoscope and vitascope. These bands have their ends pasted together, and are of such length as to fit rather loosely over the stationary cylinder and the depending block. A screen with a hole is provided, which is mounted on the perimeter of the circular stage, and through this aperture the spectator is supposed to see the figures. One of the beauties of the instrument is that the screen is not really necessary, and that without it the movements can be seen by an entire room full of people. When the hand wheel is turned, the block whirls around between the stationary cylinder and the endless band with the figures on it. As the block passes under each figure, by a very peculiar principle of wave motion, the figure is shifted one space forward. Thus, for each rotation of the block, every figure on the band, which, of course, means the whole band, is shifted one space ahead, so that a perfect zoetrope effect is produced, and the figures seem endowed with life.

The easiest way to figure to one's self the mechanical principle evolved is to imagine a rope secured to the floor at one end of a room and reaching clear across it exactly to the door sill opposite the wall, near whose base it is attached. Now let a footstool be placed beneath the rope near the fastened end. It is obvious that the free end will be drawn back, say a foot, from the door sill, and, of course, all the rope in front of the footstool will share the same displacement. Now let the footstool be moved forward toward the door. The rope will pass over it, and, as it is left behind by the footstool, it will regain its original place upon the floor. Each particle of the rope is left one foot in advance of the position it occupied when in front of the footstool. As the footstool is pushed out of the door, the end rope will leave it and regain its original position with its end at the door sill a foot in advance of its position when the footstool was beneath the rope back of it. The difference between the rope illustration and the mechanism of the viviscope is that in the viviscope an endless band takes the place of the rope.

It will be obvious, we think, why this ingenious toy seemed worthy of a

far more than passing consideration. It represents a most ingenious mechanical movement, one which may be termed paradoxical, and which really is a good subject for the exercise of ingenuity in reaching a full and satisfactory explanation of its principle. Independent of this feature, it forms an excellent entertainment device, one whose principal charm consists in the fact that the figures are directly seen without the intermediation of any slot The band is perfectly fixed in position, except such parts of it as the block passes under; the block being but one-seventh of the circumference of the cylinder, the band is stationary six-sevenths of the time. This gives the requirements for a kinetoscope, and the viviscope must, we think, be recognised as such. It is peculiarly timely now when the public has been so much interested by the exhibitions of the kinetoscope and vitascope, which have been witnessed by so many. Considered as a toy, it marks the only radical advance ever made on the construction of the old slotted zoetrope. It is manufactured by E. B. Koopman, 33, Union-square, New York.

A NEW JET.

Mr. C. W. Locke is the patentee of this invention, which has for its object the more perfect and intimate association of the two gases in the mixing chamber by simple mechanical means, thereby increasing the power of the jet with silent burning of the gases.

The jet slides consist of two tubes connected by a suitable piece of metal at one end, which carries the jet pin; these two tubes telescope into two other tubes which are attached to the lantern body for which the jet or jets are intended, ready adjustment being thereby obtained with greatly increased steadiness of the jet, which hitherto has been impossible with ordinary tin trays.

Mr. Locke says: "In order that my invention may be clearly rendered, reference may be had to the accompanying sheet of drawings, in which fig. 1 is a sectional view of the jet chamber; fig. 2 is a plan and part section of jet slides; fig. 3, perspective elevation of jet slides. Similar letters of reference are used to indicate like parts.

"In constructing a mixed gas jet I employ the two usual tubes, B and B1, to conduct the two gases to the chamber, A; but, instead of leading the gases direct into the said chamber, they are caused to intermix underneath it, at C, and to enter the mixing chamber together through the vertical orifice, D. Over this said orifice is placed a deflecting cone, E, which causes the gases to descend and to issue into the upper part of mixing chamber, A, above the cone, E, through a number of fine perforations, F and F1, around the base of the cone; the gases are then passed on to the nozzle or burner by a tube, G, of special length and bore. In constructing the jet slides, I employ two tubes, H and H1, fig. 2, and connect together at one end by a piece of metal, I, which carries the jet pin, J. These two tubes are made to telescope into two other tubes, K and K1, which are attached to the lantern."

FIG 1

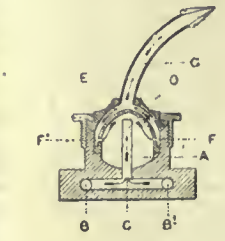


FIG 2.

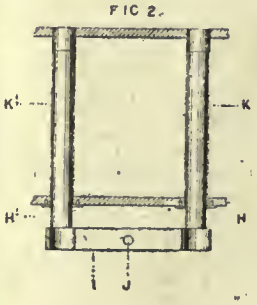
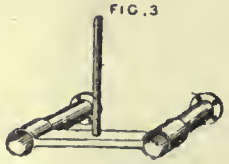


FIG. 3



The claims are, in the case of the jet:—

1. A more perfect intermixture of the two gases.

2. The prevention of the gases reaching the nozzle imperfectly mixed, by compelling the gases to enter the chamber together through one orifice, instead of two as usually employed.

3. The vertical orifice and perforated cone, causing the gases to be split up into fine streams and finally bringing them together in the upper part of chamber.

4. Compelling the gases to travel through a longer course than usual in close association.

5. Greater intensity of light, with absolute steadiness and silence in burning.

In the case of the jet slides:—

1. The means of entirely dispensing with the usual tin lime tray.

2. The means of leaving the bodies of lanterns entirely open from bottom to top, allowing the ready escape of heat.

3. Ready adjustment, with great steadiness of the jet, which hitherto has been impossible with the ordinary tin trays.

THE SKIRT DANCE.

The famous skirt dance may be defined as peculiar in the sense that it is not, says the *Scientific American*, a dance as generally understood in stage parlance. The performer standing on the stage and dressed in voluminous attire, requiring, it is said, over a hundred yards of material, by slow motions comprising more arm movements than foot movements causes the light drapery to wave about in most graceful curves. The variety of shape and contour that can be produced by a skilled performer is endless. To add to the effect, wands are used to extend the reach in the direction of the lines of the arms, and the greater control thus obtainable adds immensely to the effect. This dance was made famous by Miss Loie Fuller, whose reputation is now world-wide. During the past season refinements and improvements introduced in it have made of it a new thing.

The performance is executed in a darkened theatre. A number of projectors are distributed, four in the wings and one below the stage, so as to be adapted for flooding the figure of the danseuse with light. A pane of heavy plate glass set in the floor of the stage permits the projector beneath it to produce its effects. Each projector has mounted in front of it a disc about three feet in diameter, perforated near its periphery with a number of apertures. Coloured gelatine is fastened over most of these apertures, a different colour being used for each opening, except where one may be left for white light. The operators at the projectors follow the movements of the performer, and can produce an almost infinitely extended range of effects by varying the colours thrown by each projector.

The theatre being pitch dark, the figure can be brought slowly into view, and can be made to slowly disappear by manipulation of the projectors. She can appear in any colour or combination of colours, and can die away in similar manner. It is needless to say that it is a composite performance, in the sense that the dancer fills only a part of the functions; skilled operators are absolutely essential at the projectors.

One of the prettiest effects is produced by a magic lantern operated from the front of the stage, and shown in the cut on the left hand. The operator projects upon the drapery different figures and designs, using regular lantern slides, making the flowing, misty drapery act as the screen for his projections. It is obvious that he must give great attention to his focussing.

The skirt dance has won the attention of artists, and some very beautiful statues have been based upon its cloudlike variations of form. The slight idealisation required in representing the soft forms of waving drapery in the solid material of the sculptor's art has given most graceful and characteristic effects.

One of the most startling effects is the flame dance. The filmy veil is pure white, but, as the dancer approaches the opening in the stage floor, the veil turns to a fiery red, and the flames wave to and fro as if they were being blown by the wind. Shadows are then thrown on to the veil, which produce an exact reproduction of heavy black smoke, which suddenly changes to an ardent flame again, as if the fire had broken out anew.

HAND-CAMERA WORK.

This is a month of great activity among outdoor photographers, and the hand camera will, doubtless, be largely in evidence everywhere. The bicycle offers a means of rapidity, reaching places that possess pictorial interest, and the bicycle and the camera are closely related, since the one furnishes the means for the outing, and the other the excuse. The hand cameras of to-day are readily carried, being light, compact, and of a shape that is the most convenient for the traveller. Some few points in connexion with the camera may here be noted. The finder should be fully understood and marked, so that the relation that the image on it bears to that on the ground glass may be accurately known. The lens should be taken care of. It is not an uncommon thing to see the front of the camera pushed back for closing, accompanied by a rough handling of the lens. The latter, being the nearest or most projecting part of the front, is seized and used as a handle to force the front of the camera to the rear of the box. In addition to the danger to the rackwork or focussing gear, there is, especially when the shutter is between the lenses and no cap is used, a danger of smearing the front lens with perspiration from the hand, or even of loosening the screws holding the lens to the front board. The camera should be opened and closed by using the device supplied for that purpose; and, while on the subject of lenses, it may be well to note that these should often be examined as to their cleanliness, especially in hand cameras, which are subjected to somewhat rougher treatment than tripod boxes. Again, the diaphragm numbers should be verified. Many photographers with whom we come in contact have not the slightest knowledge of the significance of the diaphragm numbers, and, on attempting to use an exposure meter, find that they are unable to carry out the calculations because of their ignorance on this point. In the majority of cases the value of the diaphragm, given in the directions accompanying the exposure meter, is expressed by a fraction which gives the number of times that the diameter of the diaphragm is contained in the equivalent focus of the lens. The diameter of the diaphragm is accurately measured, and the equivalent focus of the lens divided by it. For example, supposing that the equivalent focus of the lens is twelve inches, and the diameter of the diaphragm is one-half an inch, then the diaphragm number is *f*-24. Should the diaphragm be marked after the U. S., or uniform system, this may be found by squaring the number

obtained after the above method and dividing by sixteen. Thus, in the example given above, the diaphragm *f*-24 would be marked U. S. 36; for $24 \times 24 \div 16 = 36$.

Hand cameras that are fitted with swing back, swing front, sliding and rising fronts, require especial care, that error be not made by the inadvertent use of either of these conveniences. It is best to make it an invariable custom to restore the camera to the normal condition before closing it up.

A tripod should, whenever possible, be taken along. While it is true that many excellent pictures have been made with the camera held in the hand, it is also true that a close examination of the ground glass, possible only when the camera is supported on a stand, will facilitate the obtaining of truly artistic results. The hand camera is no longer an instrument for snapping here and there at moving objects. It has practically displaced its tripod-holder brother, and is capable of doing all that has been done with the latter. The hand cameras of to-day are simply compact and portable modifications of tripod cameras, and, whenever possible, the stand should be employed. Held in the hand, approximation only is possible; placed on a tripod, accuracy is obtained.

Exposure meters furnish a useful guide, and should be given careful consideration. Correct exposure is necessary for the production of perfect negatives, and any instrument that will help in the ganging of this important factor should not be despised. Of their efficiency we can speak from personal experience.—*Anthony's Photographic Bulletin.*

THE DRIFT OF THE AMERICAN LANTERN TRADE.

It is doubtful if any business more forcibly illustrates the remarkable growth of this country than the magic-lantern trade. Twenty-five years ago, says *The Exhibitor*, only three houses were engaged in the business, two of these three being offshoots from the first; to-day there are two dozen deeply interested in the business, together with an endless number of opticians, variety stores, and others, that more or less handle the lanterns and views. The fact that they "do" is a sufficient answer to the question that naturally arises as to how they all can exist. This business differs not in its laws from those that govern all trades; unceasing efforts to improve the quality, vary the stock, and wisely regulate the prices are the tests that determine the success or failure of any trade; as regards quality, one who has studied the drift of this trade must have forced upon him the value of the advice to keep the "BEST." Keen competition, that of necessity follows such a spread of business, has forced down the prices of all goods; the margin is very small but the goods that have been kept up to the best have not been forced into the competition as deeply as the cheaper grades. The slide section of the business has suffered more from the competition in quality than the lantern. Up to a few years past the coloured slide business was controlled by parties who felt that, when a thing is to be done, it should be done in the best manner; this sentiment became a reality with them, and the American public had a line of lantern pictures that far excelled any other stock.

True the variety of subjects was very limited as compared with the English market, but the quality was infinitely better, better by reason of good originals, and better by reason of better painting. There has never been any earnest effort made by the American manufacturers to furnish plain views of scenery such as has been shown by the French and English makers, and consequently there is not in the market to-day a full set of the natural scenery of this country of first-grade slides. This shows a lack of enterprise that is remarkable, considering the opportunities offered. We are patriotic enough to think our scenery and wonders excel all others.

The plain slides in the market, of American make, covering all other subjects, such as Bible history, sentiment, hymn illustrations, intemperance &c., are so far above the English grade as to be beyond comparison.

This is owing to the fact that nearly all of such American slides have been furnished by the maker of the best coloured views, and in their production artistic skill and liberality have been the potent factors.

The advent of the English slides in the market has given the public a greater variety with a much lower grade; such an influx necessarily had its effect on the trade, new things always attract attention, but a public which had been educated as this has been could not fail to soon recognise the vast difference in quality, and the reaction has already set in, so that the demand for the better goods has already made the past season better than for several years. Right here we would impress the fact that there is a wide field open for slides to suit the American public, the mass of the imported stock deals with scenes, characters, habits, and customs that are entirely foreign to the American ideas.

CUTTING AND MOUNTING STEREOSCOPIC PRINTS.

Cutting and mounting is the most troublesome part of the business, but, though rather tedious, it becomes easy with practice. I use an ordinary half-plate cutting shape, with a series of horizontal parallel lines ruled upon it, and also the vertical height of the print marked at each end; I cut upon a thick sheet of glass, with a convex-edged knife.

The prints, it must be borne in mind, have to be transposed on the mount, or else a *pseudoscopic* effect would result, distant objects being brought near, and the foreground thrown into the distance; in fact, the whole scene is turned inside out. So, before the halves of the print are separated, it is well to turn them over and mark on the backs L and R, and then, when they are turned face up, the letters will come right. The R will be on the half which was originally the left, and will indicate that it now has to go to the right. I don't trouble to do this myself, for, before pasting them, I just give a stereoscopic glance to see that they are right, and again, when they are on the mount, to be sure that they coalesce properly.

Another important thing to note is that the distance between the same point in each picture should not exceed $2\frac{7}{8}$ inches. It is easier for many persons to unite them in the stereoscope if the separation is only $2\frac{3}{4}$ inches.

I believe that some people have never seen a stereograph properly, and that the atrocious way in which some commercial slides are mounted has discredited the stereoscope. I have found some slides as much as $3\frac{1}{4}$ inches. No ordinary eyes can unite these without the greatest strain, and they soon get weary of it even if they do succeed in seeing the picture stereoscopically.

I have seen a method of measuring the prints described by means of parallel vertical lines, ruled on the cutting shape and numbered, but from the method I use in cutting I do not require to measure at all. I print on P.O.P., the sheet cut into sixteen. This gives more height than is necessary, but I like to have plenty of margin to decide where to cut my top and bottom lines. If printing half-plate negatives at the same time, I fold for the last cut unequally, making the one an inch wider than the other for the single views. The paper, however, only cuts just long enough for the stereo prints, and, if one is not very careful in folding, some will turn out too short.

Now, if any of you can cut P.O.P. sheets with perfect accuracy, I shall be extremely obliged if he will tell how he does it. So far, I have found it the best plan to fold the paper *lengthways* for the first cut; owing to the spare width of the paper, it is not of so much consequence if there is a little creep in that direction, and the subsequent foldings are easier to make accurately. I also clip the corners together with American clothes clips before creasing down. The paper must be laid carefully on the negative in the printing frame.

Having decided where the bottom of the picture shall come (and you can have more foreground than would be artistic in a single picture), I lay the shape in position, so as to cut through the same point in each half; or, if no object is sufficiently visible there, I set it by one of the parallel lines on the glass. The top is then cut in the same way. I usually make the picture about 4 inches high. I then cut each end as close as I can to the edge of the paper without nicking or gapping the print, which is sure to happen if the knife is at all dull, and not enough margin is left for a continuous strip to be taken off. It is a good plan not to begin this cut at the edge of the paper, but to leave about $\frac{1}{8}$ inch uncut; otherwise, as you finish your stroke, you will probably tear away the corner at the lower end. Having trimmed the double print all round, it then has to be divided, and there will be a strip of $\frac{1}{4}$ inch or so to come out of the middle.

I pass over the prints to another pair of hands to brush the mountant on, and receive them back to place them on the mounts myself, having first marked with a pencil from a gauge on a T-square the dividing line between the two halves—not quite in the centre of the card. I place the left hand print first in position, bringing it up to the marked line, and about $\frac{1}{8}$ inch from the bottom of the card. See that it is squarely on, and squeeze it down. I then similarly place the right-hand one, leaving a space of $\frac{1}{16}$ to $\frac{1}{8}$ inch between them. I then sit on them till I have completed the batch, using, of course, a flat-bottomed chair and a board or a book to equalise the pressure.—Judge Docker in the *Australian Photographic Journal.*

Recently, while taking a flashlight photograph in the store of A. C. Satterlee, 3422, Germantown-avenue, Otis Wheelock, aged 28 years, of 154, North Eleventh-street, was severely burned on the arms and face by the explosion of the powder he was using. The force of the explosion threw both Wheelock and his assistant out into the street, but the assistant escaped without injury. Wheelock was taken to the drug store of M. Sonntag, 3415, Germantown-avenue, and it was found that his left hand and forearm were severely burned. But for the glasses he wore it is probable that his eyesight would have been destroyed, as the glasses were black with the burnt powder, while the left side of his face was also badly burned. M. Sonntag dressed the injuries, and on his advice Wheelock was afterwards taken to the Samaritan Hospital, where he was also treated. Wheelock is a travelling photographer from New York City, and has been in Philadelphia for about three months plying his vocation. He stated that he usually purchases the powder for flashlight purposes by the pound, but being out of the material, he had bought a single ounce at a store which he said he can locate, and believes that the boy who served him gave him an explosive by mistake for the powder he asked for. He stated his intention of holding the proprietor responsible for the mistake which resulted in his injuries.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*August 7, 1896.*

THE LANTERN RECORD.

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LANTERN MEMS.

In another month lanternists will, so to speak, "be putting their houses in order," and the first thing to engage their attention will naturally be, if they use the limelight, the supply of gas. The decision of the Home Office Committee on the safety of cylinders of compressed gas has caused one of the gas-compression companies to issue a circular to the effect that certain types of cylinders will, in future, be filled to three-fourths of the previous pressure only, viz., ninety atmospheres, instead of 120, as heretofore. This, as stated, is to ensure a uniform factor of safety.

* * * * *

Most users of gas, who are near the filling centres, or have a reserve of cylinders, will not object to this regulation, and those who are purchasing new cylinders, if they do not mind a little additional weight, can still have the full pressure of 120 atmospheres. There have been quite enough changes in the regulations as to testing, and in the condemnation of certain types of cylinders previously supplied and filled, that I think the company are wise not to cripple the industry by condemning the lighter make of cylinders entirely, if they are sound and fulfil the requirements in other ways.

* * * * *

The whole of the practical suggestions of the Committee, as far as they affect the conduct of the trade, as in vogue last season, seem to be in the working-stress limit, which has been fixed at eight tons per square inch for seamless steel cylinders, and seven and a half tons per square inch for lap-welded steel cylinders. The older type of cylinders, while considered by experts in engineering perfectly safe at a higher working stress, will not now fulfil these conditions, hence the filling to a lower pressure, so as to reduce the working stress.

* * * * *

Nervous people will be doubly assured if they have their cylinders filled to only ninety atmospheres, and, as they will still have thirty cubic feet of gas in the forty-feet-size cylinders, and nine feet of gas in the twelve-feet size, they can easily arrange their supply to suit the consumption, according to the kind of jet they use and the average duration of the entertainment or lecture. In inexperienced hands the lower pressure is, no doubt, more manageable, especially for use with sulphuric ether, or where no automatic regulator is used but some system of fine screw adjustment.

I fancy a good time is coming again for the Biunial and Triple lanterns, as audiences are looking for something different to a succession of plain photographs. The animated pictures have given a zest for movement, and now is the time for those who have really fine dioramic effects to show the general public what can be done with properly registered well-coloured photographs, having effects or fine hand paintings. I believe I am quite right in saying that not five per cent. of the audiences at the halls where the animated pictures are being exhibited, and who nightly show so much appreciation of the results, have ever seen a really high-class entertainment of dissolving views and dioramic effects.

* * * * *

The mechanical branchee of the optical lantern world have not been idle during the last two or three months, and the consequence is that simple and practical apparatus will shortly be available for taking and projecting photographs of real life, and that can be purchased for sums that are within the means of private enthusiasts and lecturers who cater for mechanics' institutes, schools, &c. I know of two or three such apparatus, and when I have seen the latest patterns at work, which I hope to do shortly, I will give some details of them.

* * * * *

I have been away from town for three weeks, and have thought little of lantern matters, for my mind was fully occupied with questions of refraction, elevation, trajectory, and bad ammunition affecting the marksmen who have been shooting for the Queen's and other valuable prizes at Bisley Camp. The temperatures of 85° to 90° Fahr., which one had to bear in the open and under canvas, was trying in the extreme, but, if I understand the description of the sufferings of those in town, my *confrères* there were certainly worse off, for the splendid air of the place and the breezes from the Surrey hills made the evenings and mornings delightful. The intense light was at times very trying, for the sun's temperature, as registered by solar radiation thermometer with blackened bulb *in vacuo*, reached 155° Fahr. I was impressed more than once with the necessity of men not used to outdoor life protecting their eyes with suitable tinted preservers, and, as this is a subject photographers, as a rule, do not pay sufficient attention to, I mention it here with the hope that those who make rapid changes (as is necessary in the profession) from the dark room to brilliant daylight will guard against shocks to their sight, and not be afraid to put on a mild, neutral-tinted pince-nez or spectacles directly they emerge from the dark room.

* * * * *

In my own case I found it absolutely necessary at times, in order to get proper definition when reading, to put on my tinted glasses, and I feel sure that any one, like myself, suffering from mild astigmatism (and there must be thousands among photographers and lanternists) will do well to keep this matter before them.

* * * * *

I have been pleased to get recently some reports of excellent results in amateur hands of the working of the small-size electric arc

lamps; among them the Lantern Society, with the new type of independent and geared adjustment for controlling either or both carbons at will, from India, where it has been used in the palace of one of the native princes and in colleges, also when working at our own medical schools and scientific and social institutes. Wherever current is available, I say to lanternists, Try the electric arc light, and, if any of the agents for electric light installations tell you there are difficulties in the way, don't be denied, but take an early opportunity of seeing the practical result of the light being used in an optical lantern yourselves. In one of the instances referred to above the apparatus would have been put aside, and not used, if the engineer's report had been accepted as final, for it was stated that, if the light was used in the lantern, no other light in the building could be used. However, a scientific gentleman known to the possessor of the apparatus was consulted, with the result that a way was soon shown by which the current could be used, and that successfully, without injuriously affecting the other lights. G. R. Baker.

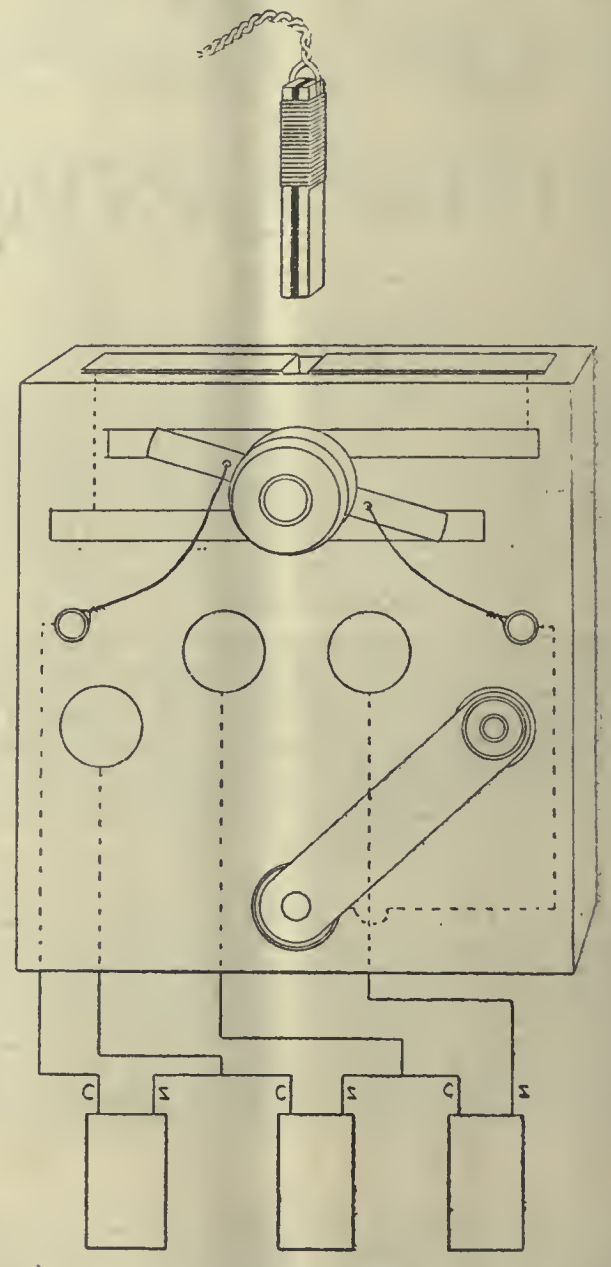
ELECTRICAL EXPERIMENTS WITH THE OPTICAL LANTERN.

All experiments which have the elucidation of a scientific lecture for their object require considerable care in preparation, and no little skill afterwards to ensure everything "going off" all right. More especially is this the case where electricity, or some allied science, is the one being treated of, and more especially still when the experiments are to be performed upon the stage of an optical lantern. Lecture-table experiments, unless performed for the benefit of very small audiences, are usually too insignificant, on account of the small scale upon which they are shown; or, if, expense and other difficulties being set aside, they are performed upon a sufficiently large scale to make them fully intelligible to every member of a large audience, they are apt to be proportionately clumsy and unmanageable. Therefore the lantern is the best means of making the experiments, though occupying but little room, appreciable to others besides those in the front row of the audience; but, if the lantern be used, everything must be done so delicately—for every fault is magnified a hundredfold—that, as mentioned before, the very greatest care must be exercised, both in preparation and actual manipulation.

Another great advantage of utilising the magnifying power of the lantern to make very small experiments in electricity serve the purpose of much larger ones is that the current required for producing the phenomena is proportionately small, and consequently the battery to produce that current need only be a fraction of the size and weight of that which would be required for lecture-table demonstrations. For instance, an electro magnet eight or ten inches high, and capable of supporting a mass of iron of sufficient size to be properly convincing to the audience, would require a battery of seven or eight Bunsen cells to work it; but a tiny magnet, the size of a halfpenny, when placed in the lantern, will appear several feet across, and will lift, apparently, a couple of tons of French nails of two feet in length by the power of a single dry cell.

I have found that a battery of three dry cells of moderate size is quite sufficient for the purpose of most of the experiments which may be performed on the lantern stage, and, if they are associated with some convenient arrangement of switches, so that one, two, or three cells can be thrown into circuit at will, it will do much to ensure the success of the various experiments. Another very important item too, where several experiments have to be performed in rapid succession, as is often the case, is a quick and ready means of making electric connexion between the necessary apparatus and the battery power, for nothing is more troublesome, or more likely to flurry and upset the operator, who has all the time the unpleasant consciousness that he is causing a "stage wait," than a number of loose wires, which *will* get entangled, and sundry screw terminals, whereof the wire holes are as elusive in the darkness as a keyhole proverbially is to him who has dined.

I have for my own use combined these desirable appliances—a multiple switch for the battery, and a plug and socket arrangement for making speedy connexions—with a current-reversing device, which last is an item of very great importance where electrolysis experiments and demonstrations in electro-metallurgy are on the tapis. The sketch shows the general arrangements, and also the battery connexions, I think, with sufficient clearness to make further description unnecessary, but a word or two about the plug and socket may not be without use. The plug consists of two strips of brass or copper, about two inches long by three-eighths of an inch broad, and of appropriate thickness, between which is sandwiched, by way of insulation, a similarly sized strip of vulcanite or vulcanised fibre, and the three are securely bound together along half their length by strong twine, which may afterwards be varnished. The lower half of the compound peg thus formed comprises the



plug proper, and to the upper half are soldered, one to each metallic strip, the two conductors of a short piece of flexible cord. The socket consists of a small square hole or pit in the top of the switch board, the two opposite sides of which are lined with brass of the same width as that employed for making the plug. Two strips of this brass, about five inches long, are bent into the shape of an L, one arm of which covers one side of the hole, the other laying along the top of the switch board, to which it is attached by screws. If each of these L-pieces form an angle of slightly more than 90°, there will be spring enough in the brass to ensure good contact with the plug when it is inserted, but care must be taken that the two arms hidden in the hole do not stand out enough to touch one another when unseparated by the plug, for, if they did that, the battery would be short-circuited, and would very soon be ruined.

A separate plug will, of course, be required for every experiment, but they can be very quickly made, and the great comfort and sense of security they give to the operator, and the certainty that they will

contribute considerably to the success and the general "go" of the experiments, will amply repay the little extra trouble which their previous preparation entails.

The two arms projecting from the socket—which, by the way, may carry ordinary screw terminals, for convenience, in connecting up any "slide" which by chance is unprovided with a plug—are connected by wires at the back of the board to the two metallic bars of the current reverser, and this, in its turn, is connected—each arm by a piece of flexible conductor attached to a convenient place on the face of the board—with one pole of the battery and with the lever of the multiple switch, as shown in the diagram, while the three first studs of this switch are joined, electrically speaking, with the other pole of the first, second, and third battery cells respectively, the fourth stud being a dummy, reserved for the "off" position.

The "slides" should, whenever possible, take the form of a "cell," such as those which are sometimes used for projecting live water beetles and suchlike sensational subjects, but, of course, for most of the experiments they need not be water-tight. I am speaking of slides intended for use in an ordinary projection lantern. A science lantern, made with an open stage for experimental work, will, of course, give more room for the necessary apparatus; but, even where such an instrument is available, the cell form of slide is preferable to another, because it will confine operations, to a great extent, to one plane, and thus keep the various parts in focus upon the screen—a thing which is not at all easy to accomplish unaided. The majority of lanterns have stages deep enough to admit a slide from three-quarters to seven-eighths of an inch thick; thus there is plenty of room for a cell whose two glass walls are separated about half an inch, and in this space most of the magnetic experiments can be performed.

One slide may take the form of a cell, in which are a dozen or two of small iron nails, which, when a tiny permanent magnet is inserted, will cling to it, and can only be detached by the vigorous use of a brass rod, or some other implement; then a similar slide, but fitted with a horse-shoe electro magnet, may be used, to show that soft iron is only magnetic by virtue of the electric current circulating round it, and that, as soon as that current is broken, the magnetism ceases. A pinch of iron filings in the cell, by clinging to the poles, even after the current ceases to flow, will demonstrate the existence of that residuary magnetism, which acts an important part in modern dynamos. For such experiments as these an erecting prism is a great advantage, for to see an electro magnet drag *down* a mass of iron nails from its place on the roof is not, at first sight, so convincing as it would be if the operation were shown right side up.

The familiar experiment, so important in treating of magnetism, whereby the "lines of force" are made visible by means of iron filings sprinkled upon a plate immediately over the magnet, requires a vertical attachment to the lantern, if it is to be performed in the usual manner; but there is another plan, which should answer almost as well. Support the magnet in a water-tight cell, which can then be filled with glycerine, or other heavy, transparent fluid (how would carbon bisulphide do?) in which a sufficient quantity of iron filings (not turnings) have been mixed. The specific gravity of the liquid being very high, the filings will only sink to the bottom slowly, and, when the magnet is excited, they will rise and form the characteristic curves and festoons. In this way the usual round of experiments may be arranged for the lantern, and bar, horse-shoe, and annular magnets, or magnets in pairs, with like or opposite poles in juxtaposition, be made to exhibit their characteristic curves. In the same way magnetic fields, such as are found around conductors, within helices, &c., may be shown.

So much for magnetism. I have said nothing about the experiments appertaining to static electricity, although, according to the arrangement of most text-books on the subject, "frictional electricity" is usually disposed of before the "voltaic" is touched upon; but the very simple appliances necessary for the explication of this branch of the subject are so obviously applicable to the lantern, that it is unnecessary to say anything about the manner of application.

Electro-chemical decomposition can be well shown in the lantern, but for experiments of this kind an erecting prism is necessary, for without its aid some of the effects are exceedingly puzzling. For the electrolysis of water a simple cell is required containing the liquid—which must be acidulated, for water by itself is not a conductor—into which the current is led by means of two strips of platinum foil about an inch apart. With one battery cell no effect will be apparent, for the voltage is insufficient; with two, bubbles begin to make their appearance—they look like huge boils upon the screen—and, with the full complement of three cells, the bubbles will form very rapidly, and rush to the surface of the water, which looks as if it were boiling violently. If all this must be shown upside down—for the slide cannot be inverted—the bubbles look like mercury falling to the bottom, thus giving quite a wrong impression. Tiny inverted test tubes can be used, one over each platinum electrode, to show that hydrogen is evolved at one in just double the quantity that the oxygen is detached at the other, a condition of things which is immediately reversed when the electricity is sent through the cell in the opposite direction. Other electrolytic experiments which can be performed with equal ease will rapidly suggest themselves. Electro-metallurgical operations of a practical kind are not so easily shown, because the layer of metal deposited by this small electric current would not sufficiently affect the total thickness of the electrodes in a short space of time to be apparent on the screen, but the principle can be demonstrated by means of an analogy. Thus the gold or silver plating bath, or the copper sulphate solution, may be replaced with a saturated solution (filtered) of lead acetate (sugar of lead), in which leaden electrodes are immersed, and, when the current is switched on, the effect is a very beautiful one, a treelike growth appearing all over the cathode, while the anode slowly wastes away to keep up the supply of lead in the solution. On reversing the current, the tree will immediately droop and begin to dissolve, while that which was before the anode will at once begin to sprout with the same fernlike structure.

There are very many similar experiments which can be performed with equal ease in the lantern, which are now usually laboured through at the lecture table, unconvincing to the audience, and unsatisfactory to the demonstrator. Transferred to the lantern stage, their performance only occupies half the time, with barely a tithe of the trouble, and to the audience they will all be instructive, and many of them beautiful.

CECIL M. HEPWORTH.

SOME FACTS ABOUT ACETYLENE GAS.

[Photographic Times]

ALTHOUGH, during the past year, the daily press, as well as journals and magazines, scientific or otherwise, have teemed with articles relating to this brilliant new illuminant, it is not a little curious that an infinitesimal amount only of real information on the subject has been imparted by any of them. The appetite of the public, ever alert for something new, has been whetted by prophetic stories of its unrivalled brilliance, its wonderful cheapness, its adaptability to every demand for "light, heat and power." We have been told of its discovery in the laboratory of the chemist more than a half century ago, and how it "burned with a luminous yellow flame and volumes of smoke;" how, after slumbering useless during those long years, the accidental production of *crystalline* calcic carbide (CaC_2), in the modern electric furnace, had made possible the production of this gas on a commercial scale, how all the hitherto methods of lighting were to be superseded and night turned into day by its sun-like brilliancy. We were also told of the fabulous sums which had filled the pockets of the fortunate inventors and promoters of the new process, but the information and facts which the public were most interested in were totally wanting. Is this light what it is represented to be? Where can we see it? How can it be obtained? In what manner or form will it be made available? Is *anything* being done *anywhere* toward placing it on the market, or within the reach of those who are anxious to see and to use it? These, and a host of similar questions, were continually asked, but no reply was forthcoming. Is it any wonder that the dear public became sceptical, and the *interested* opponents of acetylene found ready listeners to their depreciating utterances?

But a good thing cannot be permanently injured these latter days, even in the house of its friends, and acetylene is emphatically "a good thing." Its production on a commercial scale is one of the most important of this century of wonderful discoveries. Its possibilities have scarcely been dreamed of as yet. I venture to predict here, that not only will it light the world, now illuminated to so great an extent by the rapidly diminishing petroleum or coal oil, but, within a decade, steam vessels will navigate every sea with coal bunkers replaced by cases of calcic carbide, the gas from which will fire their boilers, in place of the bulky and more costly coal now used for that purpose.

What is acetylene? It is a hydro-carbon gas (C_2H_2), the richest in carbon of any other, its components in volume being 92¼ parts of carbon and 7¾ parts of hydrogen, in 100. It is highly inflammable, igniting at a considerably lower temperature than ordinary illuminating gas, and burning with a very brilliant white flame when supplied to proper burners. The most satisfactory of these will not deliver more than one-half cubic foot per hour under a pressure of three inches of water, the light being equal to that of four burners of five cubic feet capacity each, using ordinary city gas of the best quality now supplied. The flame is essentially a cool one (owing to the small amount of gas consumed), but extremely hot at the point of ignition, as it must be to ensure the complete combustion of the large percentage of carbon which acetylene contains. This combustion is perfect; no carbon monoxide and but a small percentage of carbon dioxide are emitted, and the temperature of a room in which it is burning is raised no higher than it would be by a sufficient number of incandescent electric lamps to produce an equal

amount of light. It has been completely demonstrated that twenty such acetylene lights will not vitiate the atmosphere to a greater extent than one five-foot flame of ordinary street gas. The quality of the light is simply perfect—"a chunk of sunshine," as some one has aptly termed it. It is, indeed, daylight. The spectrum is almost identical with that of the sun; the most delicate colours are unchanged beneath its rays, and can be as readily distinguished as by daylight. It is more diffusive than any other artificial illuminant, the corners of a room being lighted equally with the immediate circle about the burners in its centre. For reading and writing it is ideally luxurious; brilliant yet soft (when properly shaded), causing no feeling of weariness or discomfort from the most prolonged usage. The flame, however, should not be gazed upon by the unprotected eye, being too brilliant for comfort or safety, and it should always be shaded in some manner. The light being of such potency that a very small burner, consuming not over one-eighth cubic foot per hour, will give the light of twenty-five candles, it may be burned in a great variety of shades and devices hitherto used only with electric incandescent lamps. No other illuminating gas can be thus used, and many new features in artistic lighting become possible with it. But it cannot be used in the large burners of five or more cubic feet capacity required with ordinary city gas. Passed through these, it burns with a brilliant yellow flame accompanied by volumes of smoke which quickly deposit a shower of soot on everything within reach. If, therefore, acetylene be used through the ordinary gas piping of a house the burners must be changed for those of a capacity suited to it. As these cost but a few cents each, the change is of no moment, and can be made by any one.

Pure acetylene gas is not *explosive*, and cannot be made to explode under *any* circumstances; but, if mixed with air in proper proportions, it will, *in common with all other illuminating gases*, explode with a violent detonation and destructive effects. These facts should be clearly understood by every one. A mixture of acetylene with 1·25 times its volume of air is mildly explosive, the energy increasing up to twelve times, after which it decreases until, with one volume to twenty of air, the explosive quality has entirely disappeared. Indeed, the addition of twenty-five to forty per cent. of air to the gas in no wise impairs its luminosity, whilst, of course, decreasing its cost; and an apparatus has been devised for adding any desired percentage to the gas, at the point of ignition. For heating purposes a much larger percentage of air must be used.

If taken into the lungs of an animal, acetylene will produce asphyxiation or suffocation by the exclusion of oxygen, but it will not poison. This has been abundantly proved by exhaustive experiments made on guinea pigs and other animals. When confinement in an atmosphere thoroughly charged with the gas was continued long enough to actually produce death, no change was noticeable in the blood upon microscopic examination, nor was any other symptom of poison apparent. Death was, in every instance, the result of the deprivation of oxygen. In other cases, when the animals were removed to the outer air before death had ensued, they quickly recovered from the effects of the gas, as they would have done after inhaling ether or chloroform. This is in marked contrast to the well-known poisonous action of the carburetted-water gas now supplied in most of our cities, and a very strong addition to the other advantages of acetylene. A comparatively short exposure to the deadly effects of ordinary street gas is sufficient to cause great changes in the blood, and the fatalities attending such exposures are increasing to an alarming extent, as every physician can testify. The general substitution of acetylene for these noxious and, at times, almost non-luminous gases would greatly lessen the dangers attending the careless opening of keys, or the "blowing out of the gas," by those still ignorant of its use. And this, not only through the non-poisonous nature of the gas, but also from the fact that the acetylene burner, with the stop cock fully open, would discharge only one-half of a cubic foot of gas per hour into an apartment, whilst the street gas burner would pass at least tenfold that amount, or five cubic feet in the same time. It would seem unnecessary to call further attention to the importance of these facts.

From the economic standpoint, acetylene compares most favourably with street gas, even at the present cost of calcic carbide. This is now procurable at twenty cents per pound, making the cost of the gas four cents per cubic foot, a pound of carbide rarely yielding less than five feet of acetylene. Used in a burner of one foot capacity, the cost of consumption is four cents per hour for a light at least equal to that obtainable from twenty-five feet of ordinary illuminating gas. At $1·50 per thousand the latter would cost three and a half cents for an hour's consumption, rather less than that of the acetylene, but also vastly inferior to the latter in the *quality* of the light afforded. If air be added to the acetylene to the extent of thirty or forty per cent., as may be done without diminution of light, its cost is cheapened by that amount, thus bringing it below the average of that furnished by the gas companies. With calcic carbide at five cents per pound, which it is sure to fall to at no distant date, acetylene will become not only the best, but also the cheapest, of all artificial sources of light.

Next to the gas itself, the most important factor in the use of acetylene for lighting purposes is the burner. It may be safely asserted that perfection in this direction has not yet been reached by any means, though one which is a great advance upon any heretofore made, and which promises to be a perfect success, is about to be placed on the market. An insuperable objection to all burners hitherto made has been the formation of a mass of unconsumed carbon around the orifice when the flow of gas was turned down low; and, further, that at one point reached in turning down it would smoke, sometimes furiously, requiring constant watchfulness and care to prevent these annoying occurrences. Acetylene is so rich in carbon, that a very high temperature is necessary for complete and perfect combustion, and this cannot be maintained with the lava tips in common use, especially when the flow of gas is reduced to a very small amount. Metal tips obviate these difficulties to a great extent, and those to which reference has been made seem to be almost perfect.

It has been conclusively demonstrated that acetylene cannot be used in the ordinary burners of five feet or greater capacity without smoking to an intolerable degree and wasting gas as well. It is, therefore, necessary to divide the light between a number of small burners. The limit of usefulness seems to be reached at about one cubic foot capacity, though I have seen burners passing as much as 1·74 feet with perfect success, being smokeless and the flame steady. But the most generally useful and successful burner is that of half-foot capacity—a true half foot—not those which being so rated consume in reality a foot or more per hour, as do Bray's 00000. Very many complaints have reached me from parties using these burners that the carbide furnished them was inferior, producing not more than two and a half or three feet of gas to the pound, instead of the five feet promised for it, the facts being that their burners passed a foot or more per hour, and the calcic carbide gave forth its full quota of five feet to the pound.

The highly actinic quality of the acetylene light renders it particularly valuable for photographic purposes, and nothing is risked in predicting a wonderful future for it in this direction. Indeed, much has already been accomplished. In connexion with one of Chicago's leading photographers a series of experiments was made during the past winter, clearly proving its adaptability to work in the studio. With exposures from two to four seconds, fully toned and perfectly lighted negatives were made, the results not being distinguishable from the best daylighted sittings. So well satisfied was he with it, that he is now having his studio fitted with acetylene apparatus for night work, probably the first in the world to adopt the new light for this purpose. It has also been successfully used in photographic printing. With several of the leading makes of printing-out papers, excellent work was done in about the time required for the same on a cloudy day. Thus all phases of studio work are made possible by night as well as by day through the discovery of this wonderful and cheap light. It is also particularly adapted to photo-micrography and the illumination of objects under the microscope. A little lamp which I devised some months since for the latter purpose consumes only one-twentieth of a cubic foot of gas per hour, and gives a solid column of intensely white light the thickness of a small lead pencil. Photo-micrographs with the highest powers may be taken with it in less than one-fifth of the time required with the most powerful oil lamp, and it has been highly commended by many of the most distinguished workers in this department of photography, who are using it in preference to all other sources of illumination.

Acetylene is the ideal light for a bicycle lamp, and already several methods of using it for that purpose have been devised. One of these, the invention of a Chicago man, seems to be eminently practical, and it will, doubtless, come into general use. It maintains a brilliant, steady light for twelve hours without replenishing, cannot be extinguished by the strongest wind or the roughest road, and is easily manipulated by any one.

For lighting railway and street cars it has no equal, either in efficiency or economy. One of Chicago's great street railway companies is about to equip its five hundred cars with the acetylene light, it being vastly brighter than any other, and the cost less. It will be furnished liquefied in cylinders under compression, four half-foot burners to each car affording greatly more light than the usual eight of the Pintsch system.

In no other field of lighting will the great capabilities and advantages of acetylene be more quickly realised than that of the optical lantern and stereopticon. Nearly as bright as oxyhydrogen, it is vastly cheaper, both in first cost of apparatus and in running expenses. The cost of operating a pair of dissolving lanterns, at present price of carbide, is not more than twenty-five cents per hour, while the light is quite equal to the most satisfactory illumination of a fifteen-foot screen. It is being used now by many lanternists with all sizes of lenses, from quarter size to whole, and at all distances from screen between ten and fifty feet. A small portable generator, weighing not more than twenty pounds, with suitable burners and a pound or two of carbide, completes the necessary outfit. No skilled attendant is necessary. It can be set up and put in operation in five minutes, and dismantled in as many more. The light is absolutely steady, clear, uniform, white, and satisfactory. Once started, it requires no attention whatever until the close of the exhibition. In short, it will prove (nay, even now *is*) a most formidable competitor of both lime and the electric arc lights; the Welsbach incandescent gas light bears no comparison with it, while as to the foul smelling and altogether unsatisfactory coal oil lamp—*it* is of the past, dead beyond resurrection.

The economic capacities of acetylene as a source of heat and power have yet to be fully developed, but sufficient progress has been made to demonstrate that they are on a par with its excellencies as a lighting medium. It may be burned in a modified Bunsen burner without smoke and with intense heat. Used in the compound blowpipe, in place of

pure hydrogen, a temperature of 4000° Cent. is reached in place of the usual 3000° of the older form. Its expansibility when mixed with air in proper proportions and fired, being greatly in excess of other gases, renders it especially valuable for gas engines, and in this direction alone a vast future of usefulness lies before it. As the object of this paper is simply a statement of *facts* about acetylene, I will not enter further into speculations as to its future, but proceed to glance at the substance from which it is generated or evolved on a commercial basis, and the means already devised for so doing.

Crystalline calcium carbide, CaC_2, the basis from which alone the production of acetylene on a commercially economic scale has been made possible, was the result of an accidental discovery, the story of which has been so repeatedly told that it seems unnecessary to repeat it here. But for the invention of the electric furnace, it would never have been known; thus do great inventions and discoveries hinge one upon another. The materials from which it is made are among the most abundant and cheapest known to man—coal dust and lime; carbon and calcium. In reality, ground coke is used instead of coal dust, as furnishing a larger percentage of pure carbon than the latter. The coke and unslacked lime, having been ground separately to a fine powder, are thoroughly mixed in the proportions of fifty-six parts, by weight, of lime, to thirty-six parts of coke, and submitted to the intense heat of an electric furnace, which fuses them down to a heavy crystalline mass—carbide of calcium. Although this substance is so hard as to require repeated blows from a heavy hammer to break up the mass, it is so susceptible to moisture that it disintegrates in a comparatively short time if exposed to the air even in an ordinarily dry room. It must therefore be shipped and kept in hermetically sealed cans or receptacles, to prevent loss by decomposition. If the finger, slightly moistened with saliva, be applied to its surface, acetylene is at once evolved, burning briskly upon application of a lighted match. A striking little experiment may be performed by placing a piece of carbide upon a plate and allowing a drop of water to fall upon it, lighting the gas at once liberated at the same time. It will continue to burn so long as fresh water is slowly applied, until the gas is all evolved and consumed, leaving a residuum of calcic hydrate in the plate.

Having thus seen some of the *facts* concerning acetylene—what it is, and from what it is evolved or generated—we may pass to a consideration of the means necessary for this purpose. In reality it is merely necessary to bring the calcic carbide into contact with water to ensure an immediate evolution of the gas. If the carbide should be reduced to a coarse powder and thrown into water, instantaneous decomposition would be the result, causing an explosion which would throw the water in every direction with considerable force, the entire volume of gas produced escaping instantly into the surrounding atmosphere; but, when a lump of the material is immersed in water, only its outer surface is subjected to the latter's action. A double decomposition takes place. The oxygen of the water uniting with the lime in the carbide forms calcium hydrate, which falls to the bottom of the receptacle as a residuum. The hydrogen of the water in turn unites with the carbon of the carbide and forms acetylene gas, which in its turn will rise into the air to be dissipated—if the experiment is performed in an open vessel. The evolution of the gas, though rapid, is quite regular and approximately gradual, the length of time necessary for its complete extraction depending entirely upon the size of the lump of carbide. The amount of acetylene procurable from a given weight of carbide is very steady and uniform, varying from 5 to 5·5 cubic feet to the pound. I have never found any that yielded less than the former amount, and occasionally have had specimens that furnished fully six cubic feet.

In order to utilise the acetylene it is necessary that it be generated in a closed vessel. Two *general* types are alone possible; but of *specific* forms there may be no end. In one type the gas is generated and maintained under compression, and the vessel must be made strong enough to resist any possible pressure. Should the latter reach that of forty atmospheres, or about 600 pounds to the square inch, the gas will be liquefied, under its own compression, each pound of the liquid being capable of giving off about fourteen and a half cubic feet of gas—or 400 times its own volume. This allows of its ready handling in strong steel cylinders, such as are used in the distribution of carbon dioxide or liquefied carbonic acid. Supplied with suitable valves for reducing the pressure to that of ordinary street gas, these cylinders may be attached to the supply pipe of a house, and the gas used in a very neat way without any care or thought on the part of its occupants. But this method of distribution will only be possible in towns large enough to support a liquefying plant, and the necessary and careful attendance of skilled workmen to place in position and look after the cylinders. The great bulk of consumers all over the country cannot be thus supplied. They must have a gas-making device at once simple, automatic, inexpensive, efficient, and safe. This belongs, to the second type of generators mentioned above, and it is of the only one as yet placed on the market that I now desire to speak—namely, the "Monitor" Acetylene Generator of Messrs. Walmsley, Fuller, & Co., Chicago, the patentees and manufacturers.

The "Monitor" generators, although made in several sizes, from a capacity for a single light to that of supplying a large house, are all of the same specific form and character—a combination of generator and gasometer, or gas-holder, in one. With the exception of the smallest size, which practically has no gas-storing capacity, they are perfectly automatic, generation of gas ceasing when it is not being burned. The gas is at no time under a greater pressure than that of a three-inch column of water, slightly in excess of that in the pipes supplying street gas, but better adapted to the smaller acetylene burner than the two-inch pressure of the latter. This never varies at any time from the moment the generation of gas begins until the supply of carbide is exhausted, and is the same in each size of generator, the proportions of area to weight having been exactly calculated to this end. They can be loaded and put in operation in a few minutes, and any one who can fill and trim a lamp can care for them.

The generator consists of three parts, namely—a tank, a combined gas generator and holder, and a drying box, or purifier. The generator slides up and down within the tank, and, when lifted out, a galvanised iron pan will be found in the latter, the use of which is to catch and hold

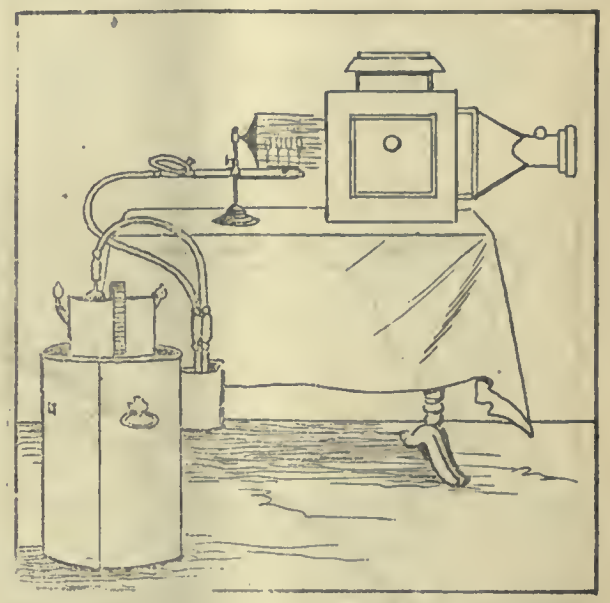


FIG. 1.—Arrangement for employing Acetylene Gas for optical projection.

the calcium hydrate formed during the evolution of gas from the carbide. The top of the generator, through which the carbide is loaded, is sealed by a water jacket. To put in operation, the tank is filled with water to within five or six inches of its top. The water jacket of the generator is also filled, quite to its top, and the generator is lowered into the tank until a catch on its top engages with the top of the former, preventing it from sinking any lower. It will then be found that the wire netting, which is placed in the generator in such a manner as to form a flooring across its entire interior, is about two inches above the surface of the water in the tank, and quite dry. The carbide is then placed on the netting, the pieces distributed over its surface evenly, and the sealing case of the water jacket put into position and pushed down tight, where it is held by a self-acting spring. A gas hose nozzle, with stop cock, rises from the top of the water jacket. The cock being opened, the catch holding the generator to top of tank is released, and it sinks down into the latter, driving out the imprisoned air within through the open stop cock. The moment the wire netting carrying the carbide is immersed in the water, gas is evolved, which issues from the cock in the form of a warm steam. The stop cock is then to be closed, and the generator is ready to supply gas until the carbide has given up its last cubic inch. The loading should not be done nearer than five or six feet to a fire or light of any kind, as a slight explosion might occur if the gas were lighted before the mixture with air is entirely driven out. This is the only possible chance of such an occurrence, and it need be no chance if the slightest precaution to avoid it be taken.

Considerable heat is evolved during the generation of the acetylene, as there is when a piece of unslacked lime is placed in a vessel of water, and for the same reason. The gas consequently comes off both warm and moist, and, if conveyed in this state directly to the burners, will condense in the pipes or tubes, causing an irregular and fitful flame. This is particularly observable in cold weather. The object of the drying box is to prevent this, which it does in a very simple and perfect manner. It is really a double box, one within the other, but with no intercommunication. The outer chamber is filled with cold water, the inner is empty, saving the presence of several metallic fans, presenting a considerable surface over which the warm gas must pass, being cooled and dried on the way. Two tubes, with hose nozzles, lead into this chamber. A short piece of flexible hose connects the nozzle on top of the generator with one of these; to the other is attached a second hose leading to the burners. The stop cock on the generator being opened, the gas flows into the purifier, issuing

therefrom cool and dry, ready for burning, which it will do with absolute steadiness and uniformity from first to last. For convenience, the drying box is hung by a suitable catch to the side of the tank.

The "Monitor" generator, as has been stated, is absolutely automatic in its action. It will furnish gas for one burner of any size, from the tiny microscopic lamp of $\frac{1}{16}$ cubic feet capacity to the Bray oooo, of over one foot per hour, or as many burners at once of any size as its capacity will supply, with equal steadiness and satisfaction, the pressure not varying a quarter of an inch at any time. If the gas be all turned off, the generator will continue with diminished rapidity until the rising of the holder lifts the load of carbide out of the water, when it will cease altogether. If necessary, it can be left in this condition for an almost indefinite time, ready for instant use. The acetylene is absolutely unchanged by standing in the holder for any length of time. A new form just completed combines generator and lamp in one, without use of hose or drying box, the gas being cooled and dried in a series of capillary tubes, which are not seen. Its general appearance is that of a handsome parlour-table lamp with shade. It is made in a great variety of forms.



FIG. 2.—Acetylene Gas employed for micrographic work.

The accompanying illustrations, with the foregoing descriptions may possibly convey a tolerably clear idea of the apparatus to my readers, and I trust the facts about acetylene contained in this article may not prove uninteresting or valueless to them.

W. H. WALMSLEY.

LANTERN SLIDES.

[American Journal of Photography.]

A LAWYER once offered to give twenty reasons to the judge for the absence of the prisoner in court. After the announcement of the first, the death of the accused, the judge kindly relieved him of the necessity of an enumeration of the other nineteen. And so when the practical slide-maker is asked in what particular is gelatine inferior to wet collodion as a medium for producing transparencies intended for use in the magic lantern, he will perhaps trump up also twenty objections to gelatine, but the first suffices the inquirer, to wit: Slides with gelatine plates do not look as well as those from wet slides when projected upon the screen.

There is apparently a falling off in the virtues of the dry plate when mustered into this special service.

Most of gelatine slides which I have examined thrown upon the screen either show a tameness in the high lights, or, if vigour is secured, it is at the expense of the shadows, which are flat and without gradation.

This is everything but desirable, but probably, admitting the general superiority of collodion, something in the manipulation of the gelatine plate might be held more accountable than the inherent depravity of gelatine itself. I have seen gelatine slides on which it was a delight to look, and on the screen too; but how many a gelatine slide looks perfection itself when examined out of the lantern, a marvel of softness and beauty, but on the screen flat, stale, and unprofitable. Collodion-slide virtues are not always patent to a mere inspection by looking through it. One learns more by experience how to judge of them.

Another objection brought against gelatine slides is the difficulty of securing uniformity of tone.

In collodion the same tone may be had, provided the conditions are the same; but we are not sure that every batch of dry plates will present the same colour. Out of a dozen made with the same plates and developed with the same solution, probably only three or four have the same tone. This is not of much consequence to the amateur, but the commercial-slide maker looks on such capers askance and doubtingly.

Gelatine is so much more convenient, and then we can make slides by contact and at night. It may therefore be acceptable to the amateur to have the experience of one who has worked to try and get what is called a wet-plate effect.

The best results which approach collodion work are produced by making the slide rather thin and then intensifying it.

I at first used bichloride of mercury and cyanide of silver, but resigned it for the following method, which you will recognise as the intensifier which Mr. Cassebaum and I employed to strengthen negatives and which was published in the *American Journal of Photography*. By its use you can strengthen the slide before fixing as well as after, but I prefer to intensify after fixing; it requires more practice to judge how far to carry the strengthening before than after. If you do intensify before fixing, wash out thoroughly all the developer.

Presuming, therefore, that you will strengthen after fixing, I proceed. First:—

Wash out very completely all hypo from the film, then place the slide in a bath composed of

Perchloride of iron	4 grains.
Chrome alum	2 ,,
Citric acid	4 ,,
Water	1 ounce.

This solution not only clears up the slide wonderfully by taking off every trace of fog from development, but also removes the last grip of hypo. It also gives a good colour.

The dish containing the solution should be rocked to prevent the formation of a network on the film, which will show itself if you neglect this precaution.

Do not let it be in the iron solution for more than a couple of minutes, until a slight bleaching is perceptible.

After removal wash well under the tap, and then flow it over with the following solution. Do not lay it in the dish, but flow the solution over it, pouring the solution back into the graduate to flow again, as in wet-plate practice; otherwise, one will be apt to stain the plate and also get a dense deposit of silver on the back.

A.

Gallic acid (best quality)	80 grains.
Alcohol (95°)	1 ounce.

B.

Nitrate of silver	40 grains.
Water (distilled)	1 ounce.

Take one drachm each of A and B, and three ounces distilled water.

When the plate has built up to your satisfaction, wash it thoroughly and dry it.

Lantern slides so made are quite brilliant, and so look very much like wet plates.

The fine quality is obtained by the gradual and slow action, giving such a fine deposit of silver as cannot be equalled by mercury.

Care should be taken in the manipulation not to touch the film with the fingers. I say this because developers of gelatine plates are apt to rub their fingers over the surface to brush off any impurities.

I would even recommend this method to commercial-slide makers, but they, doubtless, would tell me, "Collodion is cheaper."

I also employed Mr. Cassebaum's mixture of hydroquinone as a slide-intensifier.

STOCK SOLUTION.

Hydroquinone	60 grains.
Nitric acid	2 drops.
Water	6 ounces.

One-half ounce of this stock solution to two ounces of water, and one drachm silver solution (forty grains to one ounce water).

The slide should be first bathed for a few minutes in acid and water (twenty grains citric acid to four ounces water).

The tones are a rich black and the high lights clear, but I prefer the tone of the gallo-silver.

Window transparencies made with it are particularly fine.

Perhaps this last method will recommend itself to beginners, as it does not require so much care as the former; but this acknowledgment does not imply that you are not to exercise all due care and cleanliness. This reminds me to give a word or two of advice in the development of gelatine lantern slides before intensification.

Did you ever look at a Levy lantern slide and delight yourself with its beauty? There is albumen in the plate, and thanks to Mr. Carbutt for his excellent gelatine albumen slow plates—use them by all means—the Levy slide is made by the so-called Taupenot process, and the development is very slow with alkaline pyro, all detail showing first, after an acid pyro developer is applied which builds up or intensifies the image

somewhat like the gallo-silver intensifier. The grain in both is very fine. Use slow plates, give full time, and develop with solution much weaker than you would employ in negative development, and gradually build up with the gallo-silver intensifier.

On looking over a large collection of lantern slides, I became interested in examining their keeping qualities. A great many of the gelatine slides showed deterioration. Some had indeed fallen in the "acre and yellow leaf," due, no doubt, to defective fixing or insufficient washing, and might have happened to collodion slides if hypo were as hard to eliminate from it as from gelatine. Some, both gelatine and collodion, were jaundiced by mercury. I remember some of the *collodion slides* toned with mercury, which at the time of their genesis delighted me with the beauty of their tone. Now how abject, how fallen!

The collodion slides toned with bichloride of palladium were still brilliant. This is perhaps the most delightful toner of wet slides. If you use it, employ it in a very dilute solution and let the toning proceed very slowly.

Among the most durable were wet slides toned with a weak hot solution of sulphide of potassium. The tones are a bluish-black, too cold for most tastes, mine included.

The slides made according to the method here given, despite the predictions of practical photographers, showed not the slightest change; they are about eight years old. Strange to say, some experimental gelatine slides retained their pristine qualities, although they had been toned with bichloride of mercury before fixing. I attribute this to the bath of chloride of ammonia to which they were subjected after the mercury and a good washing after fixing, the ammonium taking up from the film the unappropriated mercury. This might suggest the bathing in chloride of ammonium of a mercury-intensified negative before fixing, if you must use mercury.

Slides in the collection, not toned at all, were amongst the most brilliant, perhaps on account of the greater thickness of the film. They were varnished; perhaps that contributed something to their permanency.

J. Bartlett.

LANCHESTER'S SYSTEM OF PHOTOGRAPHY IN COLOURS IN THE LANTERN.

The patentee, Mr. Frederick William Lanchester, of Cobley Hill, Alvechurch, states that his invention relates to an improved method of producing photographs in natural colours, and has for its object to so analyse and distribute the light falling on the sensitive plate that the said plate or a print therefrom may be afterwards used in a suitable form of lantern or apparatus to combine and thereby reproduce the colour or colours of the object photographed.

"In one method of carrying this invention into effect I arrange a grating consisting of a number of parallel opaque bars, between a photographic camera and the object to be reproduced, and as close to the latter as possible, the said bars being preferably fixed at an equal distance from one another and leaving spaces between of less width than the bars themselves. The camera is of ordinary construction and a prism is arranged in front of, or behind, the lens with its axis parallel to the bars of the grating, the dispersion of the said prism being such that, when the camera is focussed on the grating, the images of the slots form a series of spectra on the focussing screen or plate.

"When a combination of lenses is employed the prism may be arranged between the lenses, or one or both of the lenses may be ground in such manner as to produce the required dispersion.

"The bars of the grating should be sufficiently numerous to prevent the picture from being unduly broken or disjointed.

"In taking a photograph with this apparatus I preferably use an 'isochromatic' plate and give a rather longer exposure than ordinarily required; the resulting negative picture contains a record of the colours of the object in one form of shaded lines of varying intensity; a print is then taken preferably on an ordinary lantern slide, which, after development, is placed in a similar or identical apparatus as that hereinbefore described, and in the position originally occupied by the photographic plate; the coloured picture is then reconstructed by exposing the slots in the grating to a uniform source of white light, or another method may be employed in which a lamp and condenser are placed at the back of the lantern slide, the light issuing from the grating being thrown on a screen where the original colours are found to be reconstituted.

"The hereinbefore described analysing apparatus may be employed to produce pictures showing interference colours in film backed by reflecting surface as previously used.

"In landscape photography, where the grating cannot be conveniently arranged sufficiently near the object being photographed, a pinhole camera may be employed or the lens may be considerably stopped down, in order that both grating and landscape may be approximately in focus.

"A screen may be employed to absorb the ultra-violet rays, to prevent their reaching the sensitised plate; a cell containing sulphate of quinine in solution may be employed for this purpose.

"Referring to the accompanying sheet of drawings,—

"Fig. 1 shows apparatus suitable for the photographing and reproduction of still-life studies in portraiture.

"Fig. 2 is a modification suitable for more varied work.

"Fig. 3 is an enlarged view of a portion of the grating.

"Fig. 4 illustrates one manner in which a lens may be constructed to produce the necessary dispersion without the use of a separate prism.

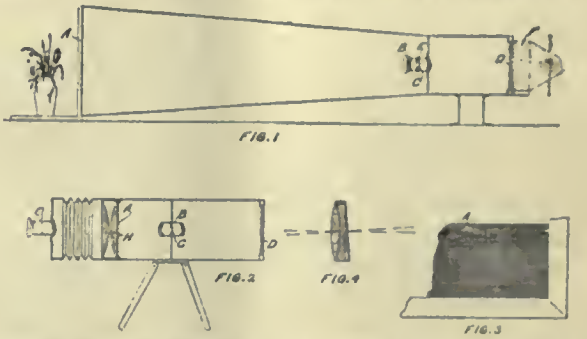


FIG. 1

FIG. 2 FIG. 4

FIG. 3

"A is the grating an enlargement of a portion of which is given in fig. 3. B is the lens or combination with analysing prism, C, forming a dispersed image of the subject on the screen or sensitised plate at D; E is a colour screen as usually employed to obtain truly orthochromatic pictures. F represents a condensing combination used in conjunction with a source of light for reprojecting the picture from the finished photograph, a screen being placed close to the grating at A to receive the picture.

"In fig. 2 the picture is first projected on the grating by an additional lens combination, G, diffusion of the image being avoided by the employment of a condenser, H."

The patentee claims: In a photographic apparatus the combination of a grating and prism.

BLAIR'S CAMERA FOR CONTINUOUSLY PHOTOGRAPHING MOVING OBJECTS.

The following is brief description of this camera:—

In a camera constructed according to this invention the lens is fitted at the front of the body and the shutter at any suitable distance from the back of the lens, the space between the lens and the shutter being enclosed by a light-tight casing.

The shutter consists of a spring-controlled plate or band, having a slot of a size suited to the amount of light required to be admitted when making the exposure. The film extends from a supply roll to a receiving roll, both of which are placed under suitable tension to prevent the film from being unwound from the supply roll, except by the film-operating mechanism, and to ensure that when it is moved by this mechanism it will be properly taken up by the receiving roll.

The film is held close to the shutter by suitable rollers or equivalent, and both it and the shutter are operated by means of a spindle on which is mounted a vane, arm, or equivalent, which may at its free edge or end be provided by one or more points adapted to perforate the film and engage with a projection or slot in the shutter so as to positively engage both the film and shutter simultaneously. The spindle is rotated by any suitable motor, and, if desired, may be provided with a fly wheel.

At each revolution of the spindle the vane or arm first engages the film and shutter, and moves them along simultaneously, and then disengages them, either automatically or by other mechanism, to allow the shutter to be drawn back by its spring, during which backward movement the film remains stationary and the exposure is made, the shutter at the termination of its backward stroke again obscuring the film.

The details of the apparatus may be modified without departing from the essential features of the invention; for example, the spindle may be provided with two or more vanes or arms instead of one as before described, so that two or more exposures may be made at each rotation of the spindle, and, moreover, the shutter may be part of a flexible band which itself constitutes the spring for effecting its return movement. The complete specification is published.

GAUMONT'S IMPROVEMENTS IN PHOTOGRAPHIC ENLARGING APPARATUS.

The patentee says:—

"Ordinary photographic enlarging apparatus is composed of three moveable frames carried by a common base, which frames are connected together by a flexible structure or by a slide, the one of the outer frames carrying the *cliché* to be enlarged, and the other the sensitive surface that is to receive the enlarged image, while the middle frame carries the objective which effects the enlargement. The enlargement obtained is the greater in size, the greater is the proportion between the distance of the objective from the sensitive surface and the distance of the proof to be enlarged from the objective. But it is not sufficient for obtaining the increased size to shift the frame carrying the

objective, because then the focus will not be correct for producing a distinct enlarged image; it is necessary also to shift suitably, by trials, the frames which carry the proof to be enlarged and the sensitive surface, in order to obtain a sharply defined enlarged image. There are, therefore, two variable conditions, namely modifications of the relation of the distances and adjustment of the position of the images.

"According to my present invention, I construct an enlarging apparatus in which the two outer frames are fixed, being connected together by a casing which cannot be expanded or contracted, the objective, situated between them, being alone movable. By this means, however, only one condition is satisfied, namely the alteration of the proportion between the distances. The enlarged image will not be well defined unless a second condition is fulfilled, and, for this purpose, instead of adjusting the frames carrying the images, I modify the focus of the objective by providing a supplemental convergent lens.

"The apparatus is constructed for this purpose as follows:—A box or casing of pyramidal or tapering form carries at its smaller end the photographic proof to be enlarged, and, at its larger end, the frame containing the sensitive surface which is to receive the enlarged image. Frames of various dimensions are provided at either end for receiving proofs or *clichés* of various sizes.

"Between the two ends the box contains the objective, which is mounted in a frame that can be slid either forwards or backward by a rack-and-pinion motion, actuated by an external button. The axis of the pinion carries a second pinion, gearing with a toothed wheel on the axis of which is a disc having divisions on its periphery, so that, on turning the button, the sliding frame can be adjusted to a position indicated by a division of the disc coming opposite a fixed pointer.

"The objective is composed of two converging lenses with diaphragms, in the ordinary manner. In addition, there are provided a series of supplemental lenses of different focus, arranged in a row on a sliding frame sliding through the objective between the other two lenses, so that, according to the position to which the objective is adjusted relatively to the proof and sensitive surface, a corresponding supplemental lens is brought between the other lenses for modifying the focus of the objective. The arrangement employed by preference for moving the slide with the supplemental lenses automatically consists in attaching to each end of the slide a small chain, passing round guide rollers, the chain at the one end of the slide being led backwards and having its end attached to a rear part of the casing of the apparatus, while the chain at the other end is led forward, and has its end attached to a forward point of the casing. Thus, on shifting the objective forwards or backwards, the slide will, on account of the above-described attachments, be automatically shifted transversely so as to bring the proper supplemental lens between the other two lenses. For ensuring the accuracy of position of the supplemental lens, the slide is formed with notches into which takes a spring tooth on the frame of the objective. The supplemental lenses may also be arranged round the periphery of a rotatable disc, instead of on a slide; or the supplemental lenses might be separate from each other, and be placed in position by hand, as may be required, but the other arrangements are preferred."

Details and drawings are given in the complete specification. The claim is:—In combination with variable photographic enlarging apparatus having the objective adjustable between two fixed end frames, the use of additional lenses for modifying the focal lengths of the objective, which additional lenses are preferably all carried by a plate that is automatically shifted transversely when the objective is shifted longitudinally, but which may also be carried on the periphery of a rotatable disc, or be mounted in separate frames.

LANTERN PROJECTIONS IN NATURAL COLOURS.

At the meeting of the New York Camera Club, held Tuesday, June 9, at eight p.m., President Walker in the chair, the subject announced for the evening was an exhibition of stereopticon views in the colours of nature by the projection method of R. D. Gray. Mr. Gray presided at the lantern himself, giving his personal attention to the proper balancing of the colours by skilful manipulation of the lights, and was ably assisted by Mr. Hopkins, of Messrs. J. B. Colt & Co. The presentation of the theoretical part of the subject was left to volunteers from the Club, and was undertaken by one of the members after a short interview with Mr. Gray immediately preceding the meeting. He had, however, attended Mr. Gray's previous exhibitions in New York, and was familiar with all that had been published about his methods of working. A rapid sketch was given of the principles of three-colour photography in general, and Mr. Gray's process in particular, while special attention was called to the various causes preventing the attainment of more than approximate results in the solution of this most difficult problem in photography. That, in spite of these limitations, Mr. Gray produced such exquisite chromatic effects, was attributed to his "personal equation," rather than to his origination or improvement of an automatic method of realising "the reproduction of the actual colours of nature in the true blending of the original." Mr. Gray himself, it should be remarked, does not claim to actually reproduce the true colours of nature in his lantern projections, but rather a harmonious and pleasing imitation of them, enjoying somewhat the same privilege as the painter who, recognising the limits of his materials, follows nature rather than reproduces her, aiming in his work to preserve organic unity, and not to present literal truth. The exhibition of some forty slides, comprising scenes in America, Ireland, Switzerland, and Italy, most of which were shown in public for the first time, spoke most eloquently in elucidation of Mr. Gray's ideas, and fully made up for that gentleman's modest reticence of speech. The slides were freely criticised as they came on the screen, and their beauty as well as their shortcomings pointed out. It was altogether the most successful rendering of natural colour values yet seen in any lantern exhibition in the rooms or before a New York audience, the triple lantern effecting a perfect registration of the three-colour impressions on the screen, while the comparatively small size of the pictures (eight feet) allowed a higher illumination than the twelve-feet screens used on former occasions with Mr. Gray's own apparatus. After the exhibition a discussion followed, in which President Walker, Mr. Stieglitz, and others took part, and Mr. Gray clearly and succinctly answered the numerous questions put to him by the members.

The New Calcium Carbide Works at Niagara Falls.—The new works of the Acetylene Light, Heat and Power Company, formerly the Calcium Carbide Company, are reported complete and in operation. The Niagara Falls Power Company supplies the electric power to drive the plant, 1000 horse power being used. An alternating current is furnished at 2200 volts, and is transformed to 110 volts. The capacity of the works is five tons of calcium carbide per day. The building is divided into five principal parts—a crusher room, a furnace room, a transformer room, a storage room, and a laboratory. Coke and lime, in the proportion of 75 pounds of pure lime to 100 pounds of pure carbon, are separately crushed in a Dodge crusher and a rolling mill, the coke going through a fifty-mesh sieve. They are then thoroughly mixed, and conveyed by a screw conveyer and an elevator to the furnaces on the second floor. There are four crucibles in the furnace, each holding 800 pounds of the mixture. The crucible forms one electrode, the carbon "pencil" the other. A few inches of ground coke are put in the crucible, and the carbon pencil is then let down on it, closing the electric circuit and making an arc of intensely high temperature. The carbon is gradually drawn up as the mixture is dumped in. The chemical action immediately begins, by which the calcium of the lime and the carbon of the coke unite to form calcium carbide. The mixture is allowed to remain in the crucible from three to eight hours, according to the amount of ingredients and the current. A mixture of 1750 pounds of lime and 1130 pounds of coke, making a total of 2880 pounds, will produce 2000 pounds of calcium carbide, The estimated cost is $23 per ton. The products of the factory are all to be shipped in air-tight drums to Pennsylvania.—*Engineering News.*

Acetylene.—Acetylene, C_2H_2, was discovered by Ed. Davy in 1836, and produced synthetically by Berthelot. The preparation of calcium carbide, on such a scale that it can be applied to the production of acetylene, seems due to Moissan and his assistant, Bullier. Acetylene is a colourless gas with an odour of garlic, but agreeably ethereal if prepared from pure material. If a small primer of mercury fulminate is made to explode in the midst of this gas, it is decomposed with a violent explosion and a large flame. It produces in equal volumes sixteen times more light than Paris gas burning in a normal Bengel burner. The amount of heat given out is, however, relatively less. Berthelot has established that acetylene is an endothermic substance. If diluted with atmospheric oxygen, it forms very dangerous explosive mixtures. It is very apt to strike back into the mains or into the gasometers. To avoid this danger, the acetylene is diluted with nitrogen. The maximum explosive power is obtained with a mixture of twelve parts of air to one part of acetylene. Acetylene is not more poisonous than the ordinary carbides forming ethylene, &c., or than coal gas. Coal gas may be enriched by adding small quantities of acetylene not exceeding five to six per cent. At the price of fifty centimes per cubic metre acetylene may enter into practical use at gas works.

I would advise stereoscopic workers to mount their pictures in optical contact, says Mr. F. J. Patersen, of Hobart. The advantages are: No appearance of mount or grain of paper, the image appearing as projected in space; a bright image without burnishing, enamelling, or squeegeeing on ferrotype paper, and perfect protection from atmospheric influence, dirt, or abrasion. Mounting is very simple. A half-plate dish, containing four or five ounces of a two-grain ten-ounce solution of gelatine. A glass plate, taken from its last washing water, is placed in the dish, to one side and end, and a pair of pictures trimmed and put into water until limp, lowered into gelatine over plate, care being taken as to proper position of pictures. The plate is now raised from end or side, the fingers of left hand keeping the pictures from slipping off (do not trouble now as to adjustment). Blot off excess of fluid, and the pictures may now be slid into position. To ensure absence of flaws through air leakage, it is desirable to put under a light, even pressure for half an hour. A piece of opaque backing paper a little larger than plate is then pasted on, and when dry cut down to plate. The gelatine solution is not for adhesion, but that pictures may be slid readily. I use P.O. paper.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*September* 4, 1896.

THE LANTERN RECORD.

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THE SEARCH LIGHT.

The vigilant and sagacious "Watchman" of the *American Amateur Photographer* (which, by the way, has gained immensely in practical value under his experienced control) has a note in his August issue in which he pays English—I beg pardon, British—photographic inventors and manufacturers a compliment to which I do not think they are wholly entitled. Remarking upon the opportunity offered by the cheap production of calcium carbide for the utilisation of acetylene as an illuminant, he scolds the Americans for lack of go-aheadness in taking advantage of the opportunity.

* * * * *

"Are we," he inquires, "losing our go-aheadness, or are we becoming generously liberal? Are we content with the honour and glory of having shown the world how economically to make calcium carbide by the ton, and willing to let others reap the fame and fortune incident to the turning to practical account of the acetylene, made possible by our discovery, or are we too busy with what we consider matters of greater importance? In any case, we are certainly lagging far behind. So far as I know, with the exception of Walmsey, Fuller, & Co., of Chicago, no one seems to be making any great effort to bring acetylene into practical use here, while in London alone there are at least a dozen firms each pushing an automatic outfit, costing only a few dollars, and which, with little trouble and perfect certainty, will give a light better for most purposes than either incandescent electricity or the Welsbach mantle; and France and Germany, and even Italy, are ahead of even the Britishers, the latter, having, in Milan, a journal devoted to its development. What are we going to do about it?"

* * * * *

Within a few months I anticipate that several generators will be on the market; but, at the time of writing, "Watchman's" estimate of a dozen firms each pushing an automatic outfit does not hold good. Two—or, at most, three—systems have so far been offered for sale, and of these only one has secured notice in the photographic press. I share "Watchman's" high opinion of the light, and shall be disappointed if it is not largely adopted for enlarging, projection, and illuminating purposes this winter. Calcium carbide is now so cheap, and the generation and combustion of acetylene is a matter of so much ease and simplicity, that a cheap and effective outfit should be neither difficult to make nor expensive to buy. A sovereign should cover the cost of a really good plant—generator, tubing, burner, and all. From the description given in these pages last month of Walmsley's acetylene lamps, I judge them to be superior to anything yet produced this side.

* * * * *

Unabated popularity at "the halls"—that is, the music halls and the variety theatres—still attends the animated photographs that form part of the entertainments provided at those places of resort. In professional parlance, they are "star" turns. I have seen each series several times, and, in my opinion, the best is that on view at the Empire Theatre in Leicester-square. Photographically regarded, the pictures are exceedingly good, being well exposed, clean, and free from spots and light splashes as they pass across the screen, while Messrs. Lumière appear to have succeeded in reducing to a minimum the effects of vibration in projecting the views. They are a vast improvement on those shown last February, and the subjects are very cleverly chosen. Country photographers in town this autumn should certainly visit the handsome theatre in Leicester-square and see these interesting exhibits.

* * * * *

Not a little of the success of these animated photographs consists, as I have hinted, in the careful selection of the subjects; a grotesque and unnatural effect is produced when, in taking a street scene, for instance, vehicles and pedestrians approach to within a few feet of the camera, and jerk themselves out of the picture, so to say. The relatively vast dimensions the figures then assume cause laughter, it is true, but the effect is certainly better without them. I am not sure that the best and most natural effects are not produced when the moving figures *recede* from the camera; certainly in a series I saw the other night (one of Mr. Paul's), a hundred yards' foot race, with the competitors tearing away from the camera, not only struck me as displaying the capabilities of animatography at its best, but appeared to give the greatest pleasure to the remainder of the audience.

* * * * *

It is barely an exaggeration to say that during the last two or three months a camera for taking continuous film photographs of moving objects to be utilised for projection purposes would have sold at famine price. But such an instrument has not been obtainable in the open market for love or money. There were, until a few days ago, probably not more than three or four actually in use in this country, and those who possessed them would not, for obvious reasons, supply would-be rivals. The animated picture "boom" has been skilfully restrained within certain channels; but, if all I hear be correct, within a very few weeks cameras and lanterns for taking and showing the pictures will be commercially available. A firm that advertised one of the former some weeks ago is not yet ready to deliver. Meanwhile, in Paris, the Anglo-American Photographic Import Office, 368, Rue St. Honoré, advertise the De Bedts Kinetograph for taking the negatives and projecting the positives. This costs 40*l.*, and besides the two purposes named is also available as an ordinary kinetoscope.

Radiant.

LANTERN MEMS.

THE optical-lantern manufacturers in London have been busy during the paat month in perfecting the apparatus for projecting animated photographs that they set about making as soon as the Cinematograph was shown in public, and the result is that, besides that of Mr. Birt Acres and Mr. Paul's, there are now on the market two of a less expensive nature that will be found to answer satisfactorily. One is for public lecturers' use in large halls, where the question of portability and noise in working have not to be taken ao much into consideration as steadiness of the resultant picture and brilliant effect. The other is of a portable nature, and is capable of being used in any-sized room and conveyed about from place to place in a case very little larger than the ordinary single lantern of best make.

* * * * *

HAVING had the opportunity of witnessing the results obtainable by the latter instrument at a private view afforded me the other evening, I think I cannot do better than describe this first. The original idea of the designer was to combine a cinematograph with a lantern that could be quickly converted into one suitable for the projection of photographs of ordinary size; and he seems to have accomplished the same very satisfactorily, for, in a few seconds after releasing a thumb screw and slipping the band off the driving wheel, the whole of the working part of the cinematograph slides away, and the ordinary front, with lens of suitable focus, can be arranged to take its place.

* * * * *

As I said before, it can be used in any-sized room, for on the occaaion of the exhibition referred to the apparatus was about sixteen feet from the screen, and the disc about four feet diameter. The picture was very fairly illuminated, although only a simple blow-through jet of the ordinary commercial pattern formed the illuminant. I should say, with a first-class mixed gas jet, and a distance of thirty-two feet, a very good eight-feet diameter picture could be produced. The films used were both American and French, and there seemed no disposition to catch or falter; in fact, the apparatus was worked very quickly at one time to see if it would in any way fail, but it answered capitally.

* * * * *

THE apparatus shown me was the first completed instrument after the original model, and a number are already on hand, so that the trade can be supplied in a fortnight or three weeks. The price of the apparatus will be 36*l.*, and includes a powerful jet, glass water trough, and case ready for use. The price of the films is from 2*l.* 15*s.* to 5*l.* 10*s.*, according to subject and length. I am very pleased to learn that some of the English workers in the direction of film photographs of animated subjects have been successful in getting really transparent films and also good local and typical subjects for use in apparatus of this class, while, with the demand for kinetoscope films for projection, rather than for the visual kinetoscope, no doubt the American producers will supply the more transparent kind, suitable for use in optical lanterns.

* * * * *

UNTIL the illustrations are published of both the new machines, it will be a little difficult to give the exact technical description of each part; but I think I can convey an idea of the portable one by giving the following particulars:—The driving wheel is attached to the right-hand side of the mahogany body of lantern, and is connected by a band to the cinematograph, which consists of one aprocket wheel, two spools for the films, a revolving cylindrical shuttle, and an intermittent motion, besides a clapper for the film, and spring stages above and below the opening, which can be adjusted for registering with the subject.

* * * * *

THE points I noted as specially ingenious were the intermittent motion, to stop and let the film go on while the shutter was revolving, the method of self-winding of the film on apool after exposure, and the pivoted end of the spindle for the spools which allow the apools to be rapidly interchanged. The apools were kept in position on the spindle by light spiral springs, and, when the pivoted end was turned, it was in line with the rest of the spindle, and so the spool could be drawn off directly. Given a firm table and films with good subjects, the operator of this apparatus ought to have a power in his hands of creating a satisfactory variatiou to the somewhat cut-and-dried lantern entertainments.

* * * * *

THE other and larger apparatus is also clever in its design and thoroughly well made, the stopping of the film being performed by a star wheel, the whole of the work being very strong and steady, while the stand on which the driving wheel is fixed is framed ironwork. The adjustments are auch that great exactitude is obtained, and the maximum amount of light is assured by the system of shutter used. It follows that a certain amount of noise is inseparable from the engaging of the points of the star wheel in the motion, but this is not found detrimental in halls and public places of entertainment.

* * * * *

NEITHER of the apparatus has so far been fitted up as a camera for taking animated photographs, and, as I consider that this will give the great impetus to the sale for private lanternists, I shall be glad to see the necessary adjunct completed, so that employers of labour who have a liking for photography may be able to have permanent records of the work for reproduction and projection at any time. In the same way as the hand-camera craze largely increased the number of lanternists, so a convenient kineoptic camera, with convenient view-finder and portable but firm stand, will give the necessary impetus to the sale of cinematographs and apparatus of that order.

* * * * *

THE question is now and then asked as to how to quickly make designs, write formulæ, or words and figures quickly for projection on a screen, and, although it is probably known to many readers of these "Mems," there are evidently some lanternists who require to know. The first simple method is to smoke with lighted camphor a piece of glass, holding it by one corner with a pair of pliers; this is bound on one edge to a cover glass, and a mat is put between to be ready for use at a moment's notice, as anything can be written on it with a pointed piece of wood. The second method is to have a piece of finely ground glass, write on it with a pencil, and render transparent by paraffin oil.

G. R. BAKER.

ELECTRICAL EXPERIMENTS WITH THE OPTICAL LANTERN.

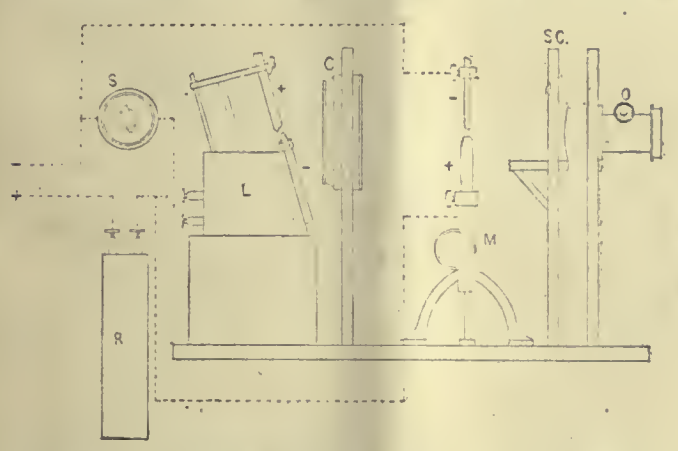
II.

THE experiments described last month were of such a kind that they could be performed with the aid of very small battery power, and the fact that much more effective results could be obtained with two or three simple dry battery cells, with the aid of the lantern, than could be got from twice as many large Bunsen cells at the lecture table, was cited as the chief excuse for employing the lantern. But there are other experiments which absolutely necessitate the employment of some sort of projection apparatus, for, from their nature, it would be quite impossible to demonstrate them without such aid: the electric arc light, for instance. An arc cannot be produced on a large-enough scale for more than two persons at a time to properly study it direct, and, even under these circumstances, the intensity of the light produced and the powerful radiant heat are serious obstacles to comfortable study. But it is peculiarly adapted for projection upon a screen, for its own light is so intense that its image will bear enlargement to almost any extent, and its behaviour under all sorts of conditions made manifest to every member of the largest audience.

Unfortunately, the excuse urged in regard to the magnetic and electrolytic experiments previously mentioned, that but a very small battery power was necessary to supply the motive force, will not hold good in reference to the projection of the electric arc, which, as every one knows, requires a very considerable battery power to maintain it even for a short length of time. But the arc light is now so largely used for high-class lantern work, and is so rapidly extending its sway, that in many cases that difficulty is no difficulty at all, for the one supply to the projection lamp can be drawn upon for the lamp whose image is to be projected—a method which will require no special fittings, except an extra switch, and which will involve no alteration of existing arrangements.

A few years ago, at the last great electrical exhibition at the Crystal Palace, it fell to my lot to operate the lantern for Professor Fleming, in illustration of a series of lectures by him on "Electricity and Magnetism." Many of these illustrations took the form of experiments performed upon the "table" of the lantern, and it was for these that the little arrangement of plugs and switches, described last month, was devised. The arrangements for projecting the image of the arc and carbon points upon the screen, and demonstrating its behaviour under various conditions, although showing nothing of particular merit or novelty, were so successful and effective—though I says it as shouldn't—that a description may serve as a useful hint to others.

The sketch shows the general arrangement of the lantern, which, it will be seen, was of the skeleton variety, consisting of three



uprights—one carrying the condenser, C; another, S C, being a peculiar form of slide carrier specially made for single-lantern work; and the third serving as a support for the front lens, O. Each of these was movable along the base, but the correct positions once found, of course no further alteration was required, except to the slide-carrier portion. To the back of the slide carrier a small shelf was fixed, upon which were placed the cells for the electro-magnetic and other experiments, and when these were going forward the S C portion would have to be shifted bodily forward, so as to bring the object upon the shelf into position.

A condenser of six inches diameter was used, and the objective was twelve inches in focal length. These two were placed about twenty-four inches apart, with the slide midway between, so that the cone of rays from the six-inch condenser was reduced to approximately three inches in diameter at the point where the slide was placed.

In the sketch the slide carrier is shown shifted right forward, to make room for the experimental arc lamp which occupies its place. This was made, if I remember rightly, from an old microscope, whose rack-and-pinion adjustment served for the feeding movements, by which the lower of the two carbons could be gradually raised as they burned away. The projection arc lamp at the other side of the condenser was a Brockie Pell automatic lamp, supplied by Newton, a really excellent lamp, whose behaviour throughout was admirable. The method of connecting these two lamps with the electric current supply is clearly shown in the diagram. The two main (100-volt) leads at the left-hand side are connected—one through the necessary resistance to the negative terminal of the automatic lamp, and the other interrupted by a switch to the other terminal. This positive lead is tapped on the "live" side of the switch by a wire which carries the current to the *lower* carbon holder of the hand-feed lamp, whose image is to be projected. The negative lead for the *upper* carbon holder joins the negative lead to the projection lamp *after* it has passed through the resistance, so that the experimental lamp is always in circuit, and cannot be shut off by the switch, which, however, has full control over the other.

The lower carbon of the experimental lamp is of large size, and is made positive in order that the crater formed in it by the action of the current may be in a suitable position for the reception of various foreign objects, whose behaviour, when subjected to the intense heat of the electric arc, it is proposed to make visible upon the screen.

The manner of performing these experiments was this: The image of the two carbons, about half an inch apart, was first thrown upon the screen by means of the ordinary projection lamp, and, being inverted, it, of course, appeared as if the positive, or cratered, carbon were at the top and in the position most suitable for street lighting and general illumination, the reason for which could be very easily pointed out. The two carbons were then very gradually brought nearer to one another by means of the rack-and-pinion movement, and at the moment of contact, as they are kindled, the main lamp was switched off, and the carbon points then separated to the proper burning distance. In the same manner, the effect of putting small pieces of various metals in the crater could be well demonstrated, and very beautiful some of these effects are. For instance, after all the characteristics of the normal arc had been pointed out, and all the usual deductions made therefrom, the carbon points could be gradually separated, or allowed to burn apart—all the different appearances of the arc, as the distance between the electrodes varies, being duly noted—until, with its peculiarly beautiful dying flickers, the arc suddenly expires altogether, at which moment the projection lamp should be switched on, and the black carbons will appear upon the white ground once more. Then, with a pair of tweezers, a small piece of copper—say, half an inch of bell-wire, crumpled up—should be placed in the crater, and the whole operation repeated; bring the carbons slowly together, switch out the main light at the moment of touching, and then separate again, leaving a vividly green flaming arc between the points. The experiment can be repeated several times with various metals, which, if carefully chosen, will each lend an entirely different character to the arc.

Other experiments, which are very effective upon the screen, are those which demonstrate the influence of magnets of various forms upon the electric arc. The space between the carbons bridged by the current should be about half an inch, so that there will be a long arc, which will then be very sensitive to small bar magnets, being immediately repelled and made to burn on the edges of the carbons farthest away from the disturbing force. Even those little magnets sold at the toy shops, for small boys to lure miniature ironclads to destruction on the edges of a pudding basin, have a very marked effect upon the arc, which will be "blown" completely out if the magnet is brought near enough.

The carbons of the experimental arc lamp may be replaced by metallic electrodes. Two copper rods, for instance, may be used, resulting in a brilliant green arc of wonderfully pure colour. If iron rods be used, the effect of the molten metal, actually boiling in the crater, and occasionally bubbling over and running down the sides, is very interesting and beautiful. Then the changes may be rung by using different metals in the positive and negative holders, or by using carbon for the negative electrode, with one of the metals as positive, or *vice versâ*; but enough has been said to indicate a large number of experiments which, with a little ingenuity, will speedily suggest themselves.

An incandescent electric glow lamp can also be well shown by this method, and the great difference in the apparent thickness of the filament when it is glowing brilliantly, and when its shadow is merely cast upon the screen, is very marked. To show this at its best, a lamp designed for lower voltage than it is used upon should be employed, as by this means a very much more brilliant image will result. A thirty-two candle power eighty-five volt lamp, run on a hundred-volt circuit, will yield a very brilliant light. The resistance inserted in the circuit for the benefit of the arc lights may be disregarded; its influence upon a single incandescent lamp is scarcely noticeable. A separate switch will, however, be required if the filament is to be shown first as a shadow, and then by its own light upon a dark ground, with the arc light extinguished.

CECIL M. HEPWORTH.

PERSIMMON'S DERBY ON THE SCREEN.

MANY people are persuaded that they have seen this year's "Derby" actually run, says the London correspondent of the Photographic Society of India's journal, although they have not been near Epsom. In fact, the "prophets" decided not to go to the "mountain," and "accordingly" the scene on the Epsom sward had to be brought to them instead. This was effected by the enterprise of the Alhambra Management, who came out with a flaming bill on the morning after the race, announcing that the Derby of 1896 in moving reality would be enacted on their screen that evening in the form of an animatograph. And a great stroke of business they achieved. The pictures were most successful, too successful, in fact, to escape a doubting criticism in several of the clubs and society meetings by men who had attempted snap-shots and failed to get any results. These Thomases suggested the great difficulty of distinguishing between one race and another, as the explanation of the immediate appearance of a perfect set of hundreds of instantaneous pictures when they personally failed, owing to the dim light of the moment, in securing a single good snap-shot. However, there appears no adequate reason to doubt the *bona fides* of the spectacle, so that the Derby crowd is likely to

suffer in future by the abstention of that immense number who "only go to study the people, you know," and who will, of course, simply wait a day, and pursue their studies on a large white sheet from a comfortable arm-chair. It is said that the Eastman Photographic Materials Company are receiving a number of orders for long lengths of film on which these kinematographic series of negatives and positives may be made. Considering the elaborate apparatus required both for the exposures before and the projections after development, it is a striking proof of the widespread and influential interest being take in photographic progress. The results are, of course, unapproached and unapproachable by any other kind of pictorial representation for actuality; but one would hardly have expected to find such an amount of private work being prosecuted in this expensive and difficult branch as is evidently the case. The colouring of the pictures is almost a matter of course now, and the mingled effect of the many separately coloured positives makes every tint perfectly harmonious and pleasant.

[In reference to the foregoing remarks touching the alleged doubt of the animated pictures of Persimmon winning the Derby being genuine, we may say in fairness to Mr. R. W. Paul, who took the photographs, that he some time since called at our office and offered to prove the genuineness of the results.—Eds.]

SOME NEW POINTS IN PHOTO-MICROGRAPHY AND PHOTO-MICROGRAPHIC CAMERAS.

[American Philosophical Society.]

Photography in connexion with the microscope, photo-micrography as universally termed, is now such an every-day affair that one unacquainted with the facts can scarcely realise that only a few years ago its practice was confined to a very few enthusiasts at home and abroad, and its results looked upon as interesting and beautiful, but practically valueless. Yet such was the case in the later seventies, when Dr. J. J. Woodward was producing his marvellous photo-micrographs at the Army Medical Museum in Washington. His work was such a vast step in advance of any that preceded it as to attract the attention of the entire scientific world, and in many respects it has never been excelled. Being confined, however, almost exclusively to the resolution and delineation of difficult test objects, as diatoms and rulings on glass, its sole practical value consisted in the improvements in objectives brought about by the efforts of many eminent opticians, both American and foreign, to meet his exacting requirements. "The Battles of the Lenses" will, doubtless, be remembered by most of you, and there can be little doubt that the wonderful improvements in and perfection of modern objectives are due in a large measure to the impetus given by Dr. Woodward in his efforts to obtain the best for use in photo-micrography. Indeed, Nobert saw for the first time the lines of his nineteenth band in a photograph made by Dr. Woodward with one of these object-glasses.

But even more marked in their effect upon photo-micrography than the improvements in objectives have been the changes in photographic methods since Dr. Woodward's day. He worked within his camera itself, his workroom constituting a gigantic camera box, to which no ray of light was admitted during the focussing of the object and exposure of the plate save that which passed through the microscope. The source of light varied according to time and circumstances. Usually he employed that of the sun through an immense heliostat, which is still in use at the museum; but, as a large portion of his work was done at night, he also called in the aid of various artificial illuminants: magnesium ribbon, the lime light, and toward the end of his work the electric arc lamp, each with unvarying success. Not being an expert photographer himself, this portion of his work was done by a professional, and it may not be uninteresting to know that collodion or wet plates alone were used. Gelatine emulsions were as yet unknown, or practically unattainable.

It will thus be seen that, in addition to his own wonderful skill as a manipulator, Dr. Woodward had at his disposal unlimited Government resources as aids to his researches and experiments. Indeed it may be safely said that no other worker in the same field was ever so liberally provided with the means for prosecuting it. The cost in every direction was deterrent to the most of less fortunate mortals, and, as stated before, but for the many radical changes since made in photographic methods, photo-micrography would still be the recreation of the few, instead of the practical realisation of the many.

With the general introduction of gelatine dry plates, of such exalted sensitiveness that the light of an ordinary lamp sufficed for exposures with quite high powers, and portable cameras adapted for use with any microscope having an inclinable body, the making of a negative of almost any microscopical object was brought within reach of every worker. The printing, however, was not so satisfactory, especially where large numbers were required in the illustration of papers or books; but, as in the past, the steady advance in photographic methods speedily supplied the existing need, photogravure and other process methods reproduced the negative in positive form with wonderful exactness, delicacy, and cheapness, so that, at the present day, papers upon any subject may be illustrated in a manner utterly unattainable a short decade ago. By the same means the optical lantern has been brought to the fore as one of the indispensable adjuncts of a well-appointed lecture-room. Ready-sensitised plates of thin glass are now furnished at reasonable cost by several eminent makers, by use of which one can make his own slides and from his own negatives, either by contact printing or by reduction in the camera, if he is provided with one adapted to the latter purpose. In short, the microscopist of the present day finds at his disposal the ready means of illustrating his work at every stage; and one who publishes his notes without illustrations finds himself at a disadvantage as compared with his more progressive brother.

It is not the object of this paper to do more than glance at the new points in photo-micrography which have fallen under the notice of the writer during the past score of years, and to call attention to a new form of camera combining some novel features, which he has recently introduced under the name of the "autograph." It may be not uninteresting, however, if a very brief allusion is made to his preceding work in this direction, as he takes a perhaps pardonable pride in the belief, that to his efforts a considerable portion of the present acknowledged value and popularity of photo-micrography are due.

Without the slightest previous knowledge of photography in any form, I became greatly interested in its application to the microscope by my friend and mentor, the late Dr. Woodward. Many days passed in his workroom during my then frequent visits to Washington gave me a keen relish for and desire to engage in this fascinating pursuit, without, however, the slightest expectation of ever being able to do so. The costly and complicated apparatus and appliances necessary placed it quite beyond my reach. But in a few years, with the advent of portable cameras and gelatine dry plates, I became one of the numerous army of amateur photographers, and very shortly afterward, by means of a make-shift attachment to my microscope produced my first photo-micrograph, a little affair, on a plate scarcely three inches square, and not at all well done, but esteemed as almost a sacred treasure to the present day.

From this crude beginning was evolved the instrument known by the lengthy title of the "Enlarging, Reducing, and Copying Photo-micrographic Camera," which I placed on the market early in 1882. It met with instant and generous recognition, and has maintained its popularity steadily ever since. So far as I have been able to learn, it was the first American camera for this purpose to be produced commercially.

As indicated by its title, this camera is adapted to a variety of purposes. Any microscope with an inclinable body may be used with it in making a photo-micrographic negative, with or without an ocular. The latter is the usual method, since much more light is transmitted by the objective alone, whilst the long extension bellows permits a high magnification with any given lens. Dr. Woodward always worked without an eyepiece. With an ordinary photographic lens, the instrument may be used for enlarging, reducing and copying, the very long bellows rendering it particularly valuable for the latter purpose. It is, however, unnecessary to go into fuller details of the construction and capacities of this camera, since it is already so widely known.

Certain defects or rather want of adaptability to *all* purposes in this camera led to the designing and construction of my latest box, the "autograph." It was somewhat bulky, especially in the larger sizes, which in the too often contracted workroom is a hindrance to its habitual employment. It could be used only in a horizontal position, and the microscope must have a joint permitting inclination of the body, a feature not found in many otherwise excellent instruments, especially those of German manufacture. For use with these stands a vertical camera is, of course, indispensable, as it is when the object is free in a fluid, such as yeast spores, blood, pus, milk corpuscles, &c.; but, for the great majority of work, the horizontal position is the better, especially where it is desirable or necessary to use the direct rays of light from a lamp without the intervention of the mirror. To meet these varying demands, the "Autograph" camera was designed, and it is believed successfully. It may be described as follows, the dimensions given being those for a camera carrying 4 × 5 plates, the only size so far constructed. They would have to be proportionally greater for a larger-sized box.

The base or platform is of polished mahogany or other hard wood twenty-six inches long, standing upon three very short feet, to ensure steadiness on any table or other support, the front end being heavily weighted beneath. At the other end of the platform a stout frame of japanned iron, twenty-four inches in length, with joint close to its base, is firmly bolted. This frame carries the camera, which slides freely in two parallel grooves milled in its upper surface and can be secured at any desired point by a stout screw passing through a slot running the entire length of the frame, in its centre. The joint permits the frame carrying the camera to be placed and firmly held, in either vertical or horizontal positions, or inclined at an angle of 45°. For copying or making lantern slides from negatives by enlargement or reduction the latter position is almost indispensable, and is one of the most valuable "new points" embraced in the "autograph" camera as will be seen presently.

The camera box is furnished with leather bellows of best quality, extending twelve inches, which has been found to be the most generally useful, though double that length can be employed if necessary or desirable. It is fitted with a reversible back, carrying both focussing screen and plate-holder—a most desirable feature, as it greatly facilitates the proper arrangement of the object in relation to its position on the plate where the microscope is unprovided with a rotating stage. The ground-glass focussing screen is mainly useful for arranging the illumination and the object in the field of view, its surface being too

coarse to permit fine focussing with high powers. It may, however, be easily removed from its frame and replaced by a sheet of plate glass, when by means of a suitable lens the nicest adjustment can be made. The plate-holder is double, and fitted with inside kits to carry $3\frac{1}{4} \times 4\frac{1}{4}$, $2\frac{1}{2} \times 2\frac{1}{2}$ or lantern plates, in addition to those of its full size, 4×5 inches.

The front is fitted with a removable plain board, to which an ordinary photographic lens may be attached, and an additional board carrying an extension (which may be oblong or cone-shaped as desired), with an opening in its front end to receive the tube of the microscope. The flange of the photographic lens can be attached to this extension front, if it be necessary to increase the length of the camera in copying and enlarging.

When the camera is used in the vertical or inclined positions, both coarse and fine adjustment screws are within easy reach of the hand, and may be manipulated in connexion with observance of the focussing upon the screen; but, when the horizontal position is assumed, the distance is too great from screen to microscope to permit this, and other means must be provided. A short rod, turning freely in suitable bearings, is attached to the baseboard on right-hand side of the camera. To the end nearest the observer is fitted a large milled head, and to the other a pulley wheel, with V-shaped groove in its periphery, a corresponding groove being also turned in the micrometer screw of the microscope. This pulley wheel slides freely upon the rod or shaft, allowing it to be placed in line with the fine adjustment screw, where it is firmly held by a small set screw. A fine cord passed around the two grooves suffices to move the micrometer screw when the milled head is revolved. This, of course, is an old and well-known device, but, being a good one, has been adopted in this case.

The extension of the iron carrying frame beyond the end of the baseboard, with the additional weight of the camera acting as a lever, having a tendency to tip the front of the base upward, a heavy iron bar, forming one of the short tripod supports, is fitted beneath the front of the board, entirely obviating any such danger. The platform itself is of sufficient length to carry microscope, lamps, and bull's-eye condensing lens on stand, the added weight of which servea also to give increased steadiness to the whole apparatus.

It is not within the scope of this already too lengthy paper to say anything in regard to the making of a negative from a microscopic object. This must be left to another occasion. But it may not be amiss to glance for a moment at the source of light for making the exposures. Diffused daylight reflected from the mirror is probably the most generally useful illuminant, and the various positions in which the "autograph" camera can be placed give the day worker many advantages in its use. But most of us have, perforce, to do our work by night with artificial light. Fortunately there are many of these, some one of which is available to every one. The lime light, the electric arc, the Welsbach gas burner, and the humble, omnipresent, petroleum lamp are all good, varying mainly in the differing lengths of exposure required with each. And, finally, we have the new acetylene gas lamps, which place in the hands of every worker *the ideal* light for photo-micrography.

A few words as to the value of the "autograph" camera in copying and in making lantern slides by enlargement or reduction, and I will tax your patience no longer. For both these purposes the camera, fitted with a photographic lens of not more than nine inches focal length and inclined at the angle 45°, is to be placed near a window, and its base cleared of the microscope, lamp, &c. A carrying frame, with its upper surface parallel with the camera front, takes their place upon the platform, to which the book or print to be copied is fastened. The lighting, focussing, and all such subsequent details are, of course, familiar to every photographer. I cannot even hint at them here, and would suggest that, if the copy is for lantern purposes, it would be well to make it at once of the proper size to permit printing by contact, thus effecting a considerable saving of time.

Negatives of microscopic objects are generally made considerably larger than the dimensions of a lantern slide, though in some cases, as a minute diatom, for instance, they are much too small. In either case the lantern slide must be made by reduction or enlargement as necessary. For these purposes the camera is arranged precisely as for copying, except that its front end must face the window and be close to the latter. A large sheet of white paper is to be laid upon the platform as a reflector, and on this the stand used in copying (and carrying a frame containing the negative) must be placed. A focussing cloth or other covering is then spread over the space between the frame and camera, so that no light may enter the lens save that which passes through the negative. The camera is then moved to or fro upon its ways, until the image projected upon the screen is of proper dimensions, when it is to be fastened in that position, the focus sharpened by moving the bellows; and the balance of the necessary work of exposure and development done in the manner familiar to all who have mastered the simple mysteries of photographic manipulations.

W. H. WALMISLEY.

THE CAUSES OF COLOUR.

[Knowledge.]

THE beauty of the objects of nature around us depends so much on the varieties of colour which they exhibit that it becomes an interesting question, What is the cause of these differences? We have only to think of the blue sky, the green foliage, and the various splendours of flowers and fruits to realise to how great a degree the pleasure we experience in viewing a country scene is due to the many-hued surfaces of natural objects. The pleasurable feelings aroused by the sight of the deep blue of the sea contrasting with the bright red colour of the sandstone cliffs, or the effect of the sunshine when it lights up the splendid purple of the heather on the slopes of the hills, can be forgotten by none who have experienced them; and the striking effect of Eastern scenes is owing largely to the brilliance of the tints which meet the eye. It is needless to enlarge on the part played by colour in this world of ours; the difference between a world of colour and one in which surrounding objects are only distinguished by different shades of grey can be realised by all.

When we come to inquire how the red colour of a rose is produced, and why it differs in appearance from a blue flower, we must consider what happens to the light which falls upon the petals of the rose. We see the flower because the light from the sun is reflected from it, but something has happened to the light before it reaches our eyes; the light we receive differs from that which fell upon the flower. The rays from the sun penetrate to a certain extent into the substance of the flower, and most of them are reflected from particles beneath the surface. Now, the cells making up the petals of a rose contain a fluid which has the power of absorbing certain of the rays of light, and the light entering the eye after penetrating a short distance below the surface of the petals, and coming back, has passed through this fluid, and in its course some of the rays of the sunlight have been abstracted from it. Thus the light reaching us is lacking in certain of the constituents of white light—that is, it is coloured. White light may be considered as made up of the three fundamental colours—red, green, and violet—blended together. The light which has passed through a certain extent of the substance of the rose petals has been deprived of its green and violet portions, and thus the red rays alone reach our eyes. All substances which possess colour exercise this power of sifting the rays of light. Light falling on the leaves of the rose bush passes through their superficial layers, and is reflected from below the surface; thus it has to traverse certain particles, which take from it the red and violet rays and allow the green to pass. The green rays, which escape absorption, are the only ones which reach our eyes, and we therefore call the leaves green.

When white light passes through a prism, it is found that, in the band of colour or spectrum produced, the blue and violet rays are the most bent out of their original course; they are the most refrangible. The red rays are the least bent. It is found also that the vibrations of the ether filling space which produce waves of light are quickest in violet light, and slowest in red light. Some substances absorb the quick vibrations more readily and thus appear reddish in colour; others absorb the slower vibrations, allowing the others to pass through, and therefore have a green or blue colour.

When a substance is heated, its particles are thrown into a state of rapid motion, and soon set up a motion in the ether which, when the vibrations are of a certain rapidity, produces light. If a ball of iron is heated, it first of all gives out radiation consisting of dark rays, which have the effect of producing heat. As its particles become hotter and hotter, and thus vibrate more rapidly, the radiation begins to affect our eyes, and the ball glows with a dull, red heat. As vibrations of greater and greater rapidity take place owing to the further heating, the ball appears bright yellow, and finally white, when vibrations of all the different rapidities which affect our eyes are given out. In this case it is the motion of the particles or molecules of the heated body which is imparted to the ether, and so produces the effect we call light. Now, those molecules which are able to execute certain vibrations and give them to the ether absorb these same vibrations from the ether—that is, absorb certain rays of light. This effect is best seen in the case of gases, and the phenomenon is analogous to that which occurs with sound. A tuning fork or stretched wire, which can give a certain note when it is struck, is able to take up and absorb the note from the vibrating air around it when that note is sounded in its neighbourhood.

It may be noticed that the light from the electric arc, when seen near at hand, has a distinctly bluish colour; but this same light, when viewed from a distance, appears yellowish, as certain of its rays have been absorbed by the water vapour in the air on its passage to the eye. For a similar reason the sun is now considered to be a blue star; his light, which would appear intensely white and rich in blue rays especially, if it could be seen from beyond our atmosphere, appears yellowish after it has passed through that atmosphere, and has lost some of its most refrangible constituent rays.

The effect of absorption in producing colour is seen from the fact that powdered bodies generally appear white. This is accounted for when we consider that a powder consists of particles arranged at all angles, so that the light falling upon it meets various surfaces, and is mostly reflected before it has passed below the surface. Thus the white light reaching it is not deprived of some of its constituents by selective absorption, as it would be if it penetrated the substance that was then reflected. In this way powdered red glass appears white. For a similar reason, the froth of coloured liquids, such as brown ale, appears pure white. The light is reflected from the surface of numerous small bubbles, and does not pass

much through the liquid itself. Thus, also, a cloud is very opaque to light, the light falling on it being reflected at the surface of the numerous globules of water. To this is due the brilliantly white appearance of large fleecy clouds in bright sunshine.

Some substances absorb equally all the rays of light. Such substances, of which soot is an example, appear black. The reason why a flower like a white lily appears white is that the fluid contained in its cells does not absorb one sort of rays more than another, but allows all to pass with comparative freedom. White light, then, reflected from its surface, or from a little below, is not deprived of any of its constituents, but remains white.

The effect of reflection from internal surfaces, accompanied by absorption in producing colour, can be seen by pouring a coloured liquid, carefully freed from floating particles, into a white porcelain basin. Light is reflected from the sides of the basin, passes through the liquid, and its colour is seen. If, now, the sides of the basin be covered with some black substance, no light will be reflected from them, and the liquid will appear black; no light comes to the eye from the interior, and the surface of the liquid reflects all the rays equally. If next we place in the black-looking liquid a white powder like chalk, its colour is at once restored, light being now reflected from the interior at the surfaces of the chalk particles.

From the above considerations we can understand to what causes the colour produced on mixing pigments is due. A mixture of blue and yellow paints has a green colour, because that is the only colour transmitted by both pigments. The blue paint absorbs the red, orange, and yellow rays, allowing the others to pass through it; the yellow paint absorbs the blue, indigo, and violet. Thus green rays alone are permitted to pass through both, and the result is that the mixture appears of that colour.

Some substances appear of one colour when viewed by reflected light, and another when seen by transmitted light. Thus the light reflected by gold is yellow, but a leaf of gold, made so thin that light can pass through it, appears of a green colour. This appearance of different colours on reflection and transmission is also seen with many of the aniline dyes. The colour of the light due to reflection is then made up of those rays which are not admitted at all, but sent back at the surface, together with that light which has been reflected from a certain depth below the surface, and has thus lost some of its constituent rays by internal absorption. The light to which the colour is due when the substance is viewed by light which has passed through it is that which has been derived of some rays by reflection at the first surface, and again of others by absorption in passing through. Hence the difference of colour when viewed in the two different ways.

Variations in colour perception, no doubt, depend on varying sensations in our own eyes, as well as on changes in the light itself. Some curious experiments have been made with a view to testing our different sensations as to colour. It has often been noticed that a bright scarlet uniform would appear perfectly white in a good photographic dark room, with ruby glass windows. With regard to such effects, Herr H. W. Vogel described recently in Berlin some experiments he had made. He used oil lamps, and fitted on to them pure red, green, and blue colour screens. It was found that, when the white light was entirely shut out, no sense of colour was perceptible to the observers, and objects in the room appeared of various shades of black and white. He found that, when a set of colours was lit up by red light, the red pigments appeared white or grey, and this changed at once into yellow, not into red, when blue was added to the light under which they were viewed. Thus a colour was perceived which did not exist in either of the sources of light used. The colour sensation produced by a source of light also depends partly on the intensity of the illumination. From these and similar experiments Herr Vogel comes to the conclusion that our opinion as to the colour of a pigment depends upon our perception of the absence of certain constituents from the light reflected from it. Thus a surface which has a red colour is only perceived as red by us when light of other colours shines upon it, and we observe its incapacity for reflecting these colours.

When a solution of quinine is viewed in sunlight, a remarkable blue shimmer is noticed, extending for a short distance beyond the surface at which the light enters. A similar effect is noticed with many other substances, the colour being different in different cases. The phenomenon is known as fluorescence, as it is well observed in the mineral fluor spar, and is due to the fact that light is absorbed by the substance, and is again given out as light of a different colour. For instance, rays of high refrangibility towards the blue end of the spectrum may be taken in and given out as yellow rays of lower refrangibility. In the case of quinine, invisible rays beyond the violet are absorbed, and blue or violet rays are emitted by the solution. In all cases of fluorescence, a degradation of the rays takes place; those given out are of lower refrangibility than those which disappear on absorption. By painting a screen with a solution of sulphate of quinine, the spectrum beyond the violet can be made visible, as those vibrations which are too rapid to affect our eyes are changed into others of lower refrangibility, which can be perceived when they fall on the retina. The curious blue colour of the solution of quinine extends only a short distance into the liquid, because those rays which are capable of producing it are soon absorbed, and the light which passes onward through the fluid is destitute of such rays. The colour produced in cases of fluorescence has a different origin from that of the ordinary surface colour of substances, for the rays absorbed do not disappear as light, but their place is taken by other rays of a different sort.

The nature of the vibrations which constitute light still remains mysterious, but great advances have been made in recent years in our acquaintance with these and allied phenomena, and we may hope for still greater accessions to our knowledge in the not distant future.

J. J. Stewart, B.A.

HOW TO TAKE STEREOSCOPIC PICTURES WITH THE POCKET KODAK.

Everybody who has looked at stereoscopic prints or transparencies in a stereoscope will readily admit how very lovely and delightfully lifelike they are, and cannot but wonder why more of this kind of photography is not practised.

Fifteen or twenty years ago nearly every house possessed a stereoscope with which to interest and entertain visitors. Now where can one be found, and, when there is one, how many persons look in it? True it is that within the last year or two there has been a half-hearted revival of interest in this manner of showing one's pictures to one's friends, says the *Kodak News*, and many are now enthusiastic stereoscopic photographers, but progress has been very slow. It is difficult to assign a reason for this, but perhaps the costly initial outlay necessary up to now may have been responsible for it.

Whoever heard of a stereoscopic camera for 2*l.* 2*s.*? yet that is the total outlay required in order to make stereoscopic pictures with the pocket Kodak.

The pocket Kodak must convert large numbers to stereoscopic work now a special and expensive camera is no longer necessary, and the operations are so delightfully simple.

All that is required to start this branch of photography is, in the case of those not already possessing a pocket Kodak, two pocket Kodaks. Of course, if you already have one of these little instruments, then another will be needed.

The plan we adopted was as follows:—

The two pocket Kodaks were placed side by side, so that the finders and keys were on top, and the lenses pointing in the same direction. They were stood upon a piece of wood cut to the exact size occupied by the two cameras, and bound together with rubber bands or a strap. Other and better means of keeping the little cameras firmly bound together will suggest themselves to our readers. Our object at present is to describe a simple and inexpensive way of making these miraculously realistic stereoscopic pictures. It is most important that the two cameras should not move independently of one another.

Our plan is greatly simplified by the fact that, when the cameras are joined together, the distance between the lenses is exactly correct.

Having followed the directions above described, we are ready to make our exposures in the usual manner. We will only impress on our readers the necessity, in making snap-shots, of pressing the two buttons *simultaneously*.

In making time exposures, the exposure with each Kodak can, if there is any advantage in doing so, be made independently, but in such a case the Kodaks must not be moved from the original position they were placed in, and the same time of exposure must be given with each Kodak. On the whole, however, we advise that, for obvious reasons, the exposures be made simultaneously with both pocket Kodaks.

The films should be developed together, and for exactly the same period of time, in order that the negatives should possess a common degree of density.

So also should the negatives be printed on one piece of Solio paper.

Our method is to take a piec of Solio slightly larger in all directions than 6 × 3 inches. Cut out from a piece of opaque paper, measuring on the outside edge 6 × 3 inches, a mask having two openings, each measuring $1\frac{7}{8} \times 1\frac{3}{8}$ inches. The openings must be cut out so that the distance between their centres is just under 3 inches—say, $2\frac{7}{8}$ inches. Then mount the negatives film side up, under these openings, attaching them to the mask by means of gummed paper, so that the one made with the Kodak on the user's right hand is, when fixed to the mask, on the left side. To be sure of doing this, it will be necessary that the negatives are kept track of during the process of developing, and we would recommend them to be marked, when first taken out of the cameras, R for right, and L for left, for purposes of identification afterwards.

Now proceed to print, tone, and fix in the usual manner, and mount on stereoscopic mounts, which can be obtained. Before trimming the prints, it is a good plan to place them under a card mount with two openings (the prints can be held in position temporarily with elastic bands), and then examine them in the stereoscope. If they do not coalesce, move one print only, just a little, and examine again. When the exact position is decided upon, mount each print round the openings of the mount, and trim them down to the lines drawn.

MICROSCOPY.

It is stated on some authority that magnifying lenses were not in use till about the end of the sixteenth century. It was known long before then, however, that letters were enlarged when seen through a globe filled with water, but it was thought that magnification depended upon the nature of the water or of transparent bodies, and not upon the lenticular form of the glass. From the gradual deepening of curves, no doubt, the idea originated of producing lenses of shorter and shorter focus, until the combination of a convex lens as an objective with a concave lens as an eyepiece, distanced apart by the hands, led to the discovery of the telescope. Its conversion into a microscope would immediately follow, for, as Herschel says, a telescope used for viewing very near objects becomes a microscope.

"The first microscope would most likely be in the shape of a hand lens," writes Mr. A. B. Steele in *Knowledge*, "and this would soon be improved upon by mounting the lens at one end of a tube with the object held at the focus or attached to a piece of glass. For higher powers some system of focussing would be applied, either by sliding the object cover or the lens, and for still higher powers globules of brown glass would be used. It is said that Huyghens brought microscopes from Holland of minute spheres of glass about the size of a grain of sand, and one of the earliest experts in microscopical observations is said to have constructed an instrument of blown glass and used it in the discovery of minute forms of life. The honour of having produced the first microscope consisting of a combination of lenses is generally ascribed to a spectacle-maker named Jansen, in the small town of Middelburg, in Holland. The date can only be approximately given as shortly before or after the beginning of the seventeenth century. One of Jansen's microscopes was found at Middleburg in 1850, and was exhibited at the Loan Collection in London in 1876. It resembles one of the present-day compound microscopes without the field lens. At the time of its manufacture clear glass was scarcely to be had in Holland, and microscopes were constructed with lenses of rock crystal, and designed to view opaque objects by reflected light.

"In 1637 Descartes published a description of a simple microscope, which was a decided improvement upon the form commonly used before his time. In consisted of a simple lens mounted in a central aperture in a polished concave metal reflector, and was practically the same as the lens constructed a century later. He also designed a machine for grinding and polishing lenses nearly a quarter of a century before practical men had their attention drawn to this important subject. But about this time the man whose fame as a microscopist is best known, and who gave the first real interest to microscopy, was Hooke. He was the first to employ diffused light instead of direct sunlight. He introduced the field lens, and invented the ball-and-socket movement in the construction of the microscope. He was also the first to discover that a drop of water placed on the front lens of the objective would allow more light to pass than a dry lens could in the proportion of unity to the refractive index of water. Such lenses were subsequently known as immersion lenses. So distinguished a person was Hooke that Herschel speaks of him 'as the great contemporary and almost the rival of Newton.' It was not till nearly fifty years after his time that microscopes were provided with mirrors. The early system of focussing seems to have been effected by a 'screw-barrel' arrangement acting on the object, which was clipped between two plates and depressed from the objective by a spiral spring; and 'screw-barrel microscopes,' so named from the objective being mounted in a little barrel, became common in the eighteenth century. Many improvements in the screw-barrel system of focussing were introduced, but all were more or less defective, until a plan was discovered by which the image would remain steadily in the field, and allow the object to be viewed during the actual process of focussing.

"The invention of means to determine the exact magnifying power of any objective is due to Benjamin Martin, who applied a screw micrometer to the eyepiece with fifty threads to the inch, so that the precise number of diameters could be stated. A ruler, divided into tenths of an inch, was placed under the microscope so as to have a tenth in full view on the image; then, by measuring it with the microscope, and counting how many turns were made in so doing, the number of turns divided by five showed how much larger the image was than the object. Martin made a large compound microscope for his Majesty George III., which is now in the possession of the Royal Microscopical Society. The instrument stood on the floor, and was so large that the King could conveniently use the eyepiece while sitting in his arm-chair. The compound microscope of to-day, known as the 'Continental model,' by which most of the scientific work of our time has been performed, was evolved out of Martin's reflecting microscope. In designing and executing microscopes Martin excelled all others of his day, but his fame rests chiefly on his being the first to construct an achromatic objective.

"The possibility of applying achromatism to the microscope attracted the attention of men like Wollaston, Herschel, and Brewster; but, notwithstanding the researches of these, its adoption made slow progress, in fact, there is very little difference in the definition of the image between a microscope made last century and one made during the first quarter of this. It was achromatism that gave the stimulus to the discovery of a more precise means of focussing, and since its application in 1824 by the French optician, Chevalier, the development of the microscope has made greater progress than during the whole former period of its existence. The neglect given to fine adjustment can only be accounted for by there being little or no original investigation done with the microscope, and consequently there was no impetus given to its development. The best designs of fine adjustment were first devised by Englishmen. To Powell we are indebted for a system of focussing applied to the nose piece. In Andrew Ross's instruments the fine adjustment tube was raised and depressed by means of a screw acting upon the end of a lever of the second order, while in those of Powell and Lealand the screw acted upon a lever of the first order. The rival to these was the 'Jackson system,' the fine adjustment of which was deficient in delicacy and precision, chiefly owing to the extreme shortness of the acting lever. Lister's discovery of aplanatic foci led to still greater improvements in objectives, for his investigations were taken advantage of by three of the then leading firms of opticians in London, and very fine objectives were produced after long and persistent experiment.

"The first really practical immersion lenses were made by Professor Amici, of Modena, and were improved upon by Hartnack and others, who succeeded in producing such excellent objectives as to make it possible to resolve the most difficult tests known to microscopists. Water-immersion lenses were constructed by Englishmen about 1860, who made both new lenses and also new front combinations to screw on to old glasses. About twenty years ago a farther greater advance was made by Mr. J. W. Stephenson, of the Bank of England, who induced the firm of Zeiss, of Jena, to construct lenses in which a drop of cedarwood oil was substituted for water. These were termed homogeneous immersion lenses, because, the oil being of the same refractive index as the glass of which the objective was made, the light from the object passes into the optical system without refraction. But for greater improvements still we are indebted to the optical knowledge of Professor Abbé, of Jena University, in combination with the mechanical skill of the late Carl Zeiss. In every achromatic object-glass it is impossible to unite more than two rays of the dispersed light in the spectrum, viz., red and green, the others being left out and forming what is called the secondary spectrum. It occurred to the Professor to construct an objective with the mineral fluorite—which has a very low refractive index—as a component, and so to obtain a greater command over the removal of the chromatic dispersion. He thus devised what are now known as apochromatic objectives, which are slightly over-corrected for colour, while the eyepieces used with them are under-corrected, the result being that three rays of the spectrum are united, and an almost colourless image is produced. The magnification by means of these eyepieces may be carried to a large extent, eyepieces having a magnification of twenty-five times being used with these objectives without any apparent degradation as regards colour, especially with the lower powers. This discovery has been followed by every optician of note, both here and on the Continent, and it may be truly said that no scientific work of any importance with the microscope can be done without an apochromatic objective. The microscope has by this means been firmly established on a footing which the telescope can never, we fear, hope to possess. It "holds the head" in optics, as our French neighbours say. It is much to be regretted, however, that we are so very dependent upon foreign workmanship for the optical tools with which important scientific work is done. Our British manufacturers are no longer leading, but following, for most of the firms are making microscopes upon what is called the 'Continental model,' the instruments with which nearly all real scientific work is done at the present day."

AN IMPROVED METHOD OF JUDGING SLIDES.

[Australian Photographic Journal.]

A most interesting competition of lantern slides was held at the last general meeting of the Amateur Photographic Association of Victoria. This Society is strong in good lantern-slide makers, and the competition was looked forward to with great interest on this account, as, until the slides were handed in, no one knew positively who were the competing members.

Messrs. J. W. Small & Co., in order to encourage the making of slides of a high quality, presented an optical lantern as a prize to be awarded to the maker of the best slide from a given negative. The donors supplied the negative and laid down the rules which were to govern the competition; these, briefly stated, were to the effect that each competitor should have the use of the negative for forty-eight hours, only one slide was to be submitted by each, any plate or process might be used, slides were to be sent in under mottoes, and accompanying each slide was to be a sealed envelope bearing the same motto and enclosing the name of the maker, together with all particulars as to how the slides were produced; judging was to be done by all members of the Association who might be in attendance on the evening of the competition.

The system adopted by the Society for testing was a new one, as far as this part of the world is concerned; the slides were exhibited two at a time, the two lanterns being placed side by side, and five feet apart, and five feet discs were projected by them.

After a pair of slides had been exposed for the time agreed upon, they

were removed from the lanterns and reinserted, with the difference, that the slide which was at first in the right-hand lantern was now shown in the left, and that which had been viewed by the light from the left was changed into the right. A few seconds longer and the scrutineers ordered the vote to be taken, one slide being first voted for and then the other. The slide for which the greatest number of votes were cast remained in the lantern, and the other was removed, being thrown out of the competition; a third slide was then introduced, and so on, until the whole of those submitted had been shown; the operators varied things at intervals, for sometimes they changed the slide which remained in the lantern after a vote was taken, and transferred it to the other instrument before the next slide was inserted (the lenses were kept capped between each two changes), and this increased the interest. The object of changing the slides is said to have been the prevention of one slide having an accidental advantage over another by reason of any slight difference between the lights in the two lanterns.

The limelight was used, and the competition appears, from what we can learn, to have passed off in a very satisfactory manner.

The points to be learned from this competition, which we believe is the first that has been conducted upon these lines in Australia, are worth considering.

In the first instance (and this is a novelty here), the whole of the competitors work from the same negative; thus the holder of extra-good negatives or negatives of attractive or interesting subjects has no advantage over the man who has not the good fortune to possess such, and any accidental preference which some of the voters might exhibit for certain subjects is not allowed to interfere with the result.

Leaving the choice of plate to the maker of the slide is also another good point, as the experienced slide-maker will naturally select that plate which he understands best, or, if he is conversant with several makes, he will choose the one which his judgment tells him will best suit that particular negative.

The second novelty is the showing of two slides on the same screen at the same moment; by thus exhibiting them, the judges are enabled to obtain a clear grasp of things, and are in the best position to weigh the merits and defects of the respective slides one against the other, the discs being absolutely the same size and the illumination as nearly equal in the two lanterns as it was possible for those in charge to keep it. (We were informed some time ago that the projection lenses in the lanterns of the Association are Dallmeyer's Lantern Lenses, which were specially paired to the order of the Society.)

The device of changing the slides in the lanterns previous to the taking of the vote has also much to recommend it, as both slides are then seen under practically identical conditions.

If, instead of allowing the judging to be performed by the whole of the members of the Society, a small jury of recognised experts in the making and criticising of transparencies had been appointed, we think that there would have been no question as to the value of the slide which came off victorious; but, when the votes of the general body of members are taken, this result is by no means guaranteed, as it is extremely unlikely that every member present would be qualified to adjudicate upon a matter of this sort; and, as the members are sure to vote one way or the other, there is every opening left for an improper decision with regard to some of the slides, especially when deciding upon the respective merits of two which happen to very nearly equal. We do not, indeed cannot, assume that this was the case in this particular competition, but that the chance of such errors of judgment occurring does exist cannot for a moment be denied.

Another thing deserving of notice is the small size of the discs employed; though these are quite large enough for the testing of slides in this manner, the light can be made very intense when concentrated in such a small area, and this would give a slide which would be far too dense to look well under ordinary conditions, an unfair advantage over one which had been prepared with the usual conditions in view. The discs were only five feet diameter, now in accordance with the well-known rule, that, if a given consumption of gas per hour and a given pressure afforded a light which would give desirable results when a ten-feet disc was used, the same amount of light would illuminate a five-feet disc with exactly four times the intensity; thus it will be easily comprehended that a very heavy slide would possibly look just correct, whereas one which had been prepared for normal illumination would be swamped.

No doubt, this detail was not lost sight of by those in charge of the lanterns, but still the temptation to obtain as fine a light as possible is always very great, and it would possibly be found surprisingly difficult to resist.

These two matters appear to us to be the only elements of weakness in the scheme, though the manner of judging favoured on this occasion obviously possesses one great advantage, in that it leaves no room for fault-finding on the part of the vanquished, as every man has a voice in the placing of his own work.

Considering the competition, as a whole, we think that it is a step in the right direction, and that the initiation of this system in Australia is a further illustration of the energy of the leaders of this Association, and, taken in conjunction with the valuable papers contributed by some of them to the recent Congress, a proof of the work which they are doing for scientific photography. We anticipate that this method of deciding competitions will be introduced into more of our photographic societies.

Correspondence.

ACETYLENE GAS.

To the EDITORS.

GENTLEMEN,—Knowing the keen interest you take in any advancement in lighting generally, and particularly in *acetylene* gas, we think it would interest your readers to know that we have just very successfully illuminated the horticultural show and floral fête held at Lady Shelley's Park, Boscombe, Bournemouth, on the 19th and 20th ult.

The whole of the large marquees, each about 200 feet by 40 feet (four in number) were most brilliantly illuminated by the aid of our "Incanto" generators—twenty burners of about sixty candle power each were employed in each tent, and there was not the slightest hitch during the exhibition—the light remaining steady and smokeless—and the general opinion expressed was that this light was really superior to an electric installation which would have cost ten times the amount.—We are, yours, &c., THORN & HODDLE.

159, *Camberwell New-road, London, S.E.*

IT is stated that the Acetylene Illuminating Company, of Queen Victoria-street, have concluded arrangements with the British Aluminium Company, who are already located at the Falls of Foyers, by which they will be able to erect works of several thousand horse power, for the manufacture of calcium carbide, using water power. Pending the construction of the proposed works they have obtained the use of a considerable portion of the spare water power of the existing works of the British Aluminium Company at Foyers, and a carbide plant is now being erected there, which it is expected will be in full work during the month of October.

A NEW electric arc lamp has been invented by Dr. Leo Arons which ought to be of considerable use to professional photographers, on account of the steady white light it gives and the fact that there are no carbons to replace. In form it is somewhat like an inverted U, the electrodes being fused through the bottom of the arms, which are filled with dry mercury which has been freed from air; the curved position of the U is evacuated, and, when the current is passed through the mercury, a beautiful greenish-white light is produced. During the burning of the lamp, the mercury distils over from the hotter anode to the cooler cathode, and, when the level of the mercury rises too high in the cathode arm, it simply flows back again over the arch of the U, so that the lamp requires no attendance at all.

THE most extraordinary of all light-houses is to be found in the Hebrides, Scotland, on Armish Rock, Stornoway Bay—a rock which is separated from the Island of Lewis by a channel over 500 feet wide. On this rock a conical beacon is erected, and on its summit a lantern is fixed, from which, night after night, shines a light which is seen by the fishermen far and wide. Yet there is no burning lamp in the lantern and no attendant ever goes to it, for the simple reason that there is no lamp to attend to, no wick to trim, and no oil well to replenish. The way in which this peculiar light-house is illuminated is this, says the *Marine Record*: "On the island of Lewis, 500 feet or so away, is a light-house, and from a window in the tower a stream of light is projected on a mirror in the lantern on the summit of Armish Rock. These rays are reflected to an arrangement of prisms, and by their action are converged to a focus outside the lantern, from where they diverge in the necessary direction." The consequence is that, to all intents and purposes, a lighthouse exists which has neither lamp nor lighthouse keeper, and yet which gives, as serviceable a light, taking into account the requirements of this locality, as if an elaborate and costly lighthouse, with lamps, service room, bedroom, living room, storeroom, oilroom, water tanks, and all other accessories, were erected on the summit of the rock.—*Scientific American.*

ONLY to one little matter will I allow myself to call your attention, and that is, when you see street merchants having in their small stock of goods, stereoscopes, and stereoscopic slides, I think it pretty strong evidence that stereoscopic goods are still in demand. It calls for considerable judgment and good taste to properly compose and make a good stereoscopic picture, be it a group, an interior, or a landscape. These are not by any means as easily made as work under the skylight.

Again, take notice of the amount of capital employed in the optical lantern trade. You have only to look over some catalogues appertaining to that trade to be convinced of its magnitude. See the expensive instruments made by Beseler, Colt, Thompson, Queen, McIntosh, and others. York, of London, and Wilson, of Scotland, send men all over the world, taking negatives for slides. West, of Portsea, came to New York during the yacht race for that purpose alone. Few men dare give a lecture nowadays, no matter what the subject, without it being illustrated, and in some instances have lantern slides made for their especial use. Notice the number of lantern clubs all over the country.—JEX BARDWELL at the American Convention.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*October* 2, 1896.

THE LANTERN RECORD.

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LANTERN MEMS.

Variety is charming! Such is the conclusion come to on more than one occasion with regard to Lantern-slide Exhibitions, and, sad to relate in a photographic journal, that portion of the British public who desire recreation have actually expressed themselves satiated with plain photographs, and have asked for coloured slides and dissolving-view effects to give the audience a change.

* * * * *

A beautiful photograph projected on the screen any one with the least possible artistic taste cannot help being pleased with, but 100 or 200 photographs shown in succession is rather apt to be wearying, and I really feel that the time has come when some of the photographic societies, or lantern sections of these societies, should encourage the exhibition of artistically coloured photographic slides. If latitude were allowed artists so that any slide having a photographic basis could be shown, I think it would encourage the art of painting on glass.

* * * * *

At present the artists who can paint in transparent colours on glass, really artistically, can be counted on the fingers of the two hands, but, with the veto removed from coloured slides at the societies, artists, and particularly ladies, would "try their hand" at colouring. That they could succeed without personal instruction as to technicalities I do not think is likely, but for a reasonable fee lantern-slide artists would give the necessary number of lessons to ensure proficiency with practice. In the earlier days of the lantern, pupils had to serve a seven years' apprenticeship, but then the demand for lanterns and slides was not nearly so great as it has been during the last ten years, and photography has made it possible to produce the necessary quantity to supply the demand.

* * * * *

With regard to hand-drawn subjects as so beautifully produced by Clare, Childe, Hill, and others in the early days, and still seen in limited numbers at the higher-class lantern-makers, where hand-painted slides and dissolving-view effects are a speciality, if an artist is really clever at figure-drawing and will take the matter up, he will find, after he has mastered the details and can lay transparent colours on equally or smoothly, there would be a demand for his work. It must, however, be A1; for, if not, when magnified as it is on the screen, it is anything but pleasing to the eye.

At a recent entertainment I was an eyewitness of the pleasure the audience exhibited on some artistically coloured photographs, with effects, being projected on the screen; and I think, if the lantern section of societies would consider the advisability of having one night of the season set apart for coloured views and effects, and take care that the apparatus is capable of properly "registering" the slides, and that the slides and effects are prepared to that end, they would find the members appreciate it, especially if care is taken in arranging the seats so that none of the audience are nearer than one and a half times the diameter of the picture.

* * * * *

I have mentioned it so many times that I hesitate to reiterate that the reserved seats in halls and entertainments with the optical lantern (unless science projections only) should *not* be at the same place as for concerts, &c., as usually placed, but at some distance back, for the angle is too great to include a proper view of the picture, and the general effect is lost by the eye concentrating on some apparent defect due to excess of enlargement on account of nearness. In an otherwise well-arranged entertainment, referred to above, I noticed this defect in the disposition of seats.

* * * * *

I am glad to see that the Cinematograph, or some apparatus of this class, is to be shown at the Royal Photographic Society's Exhibition, and I trust it will be the means of inducing photographers to produce film photographs, so that something beyond the kinetoscope films may be available for projection. I observe that French and American houses are vying with each other in their endeavour to get the first market in England; but, good as some of the subjects are, I have no doubt British photographers, when once fairly started on the track, will out-distance them in popularity of subject, and probably in execution. Three or four English photographers are already at work; but, as far as I can learn, only two of them will sell their films, except to purchasers of machines or licencees; whereas, if a perfect gauge is kept, so that the films may be certain of working in well-constructed machines, there will be a good demand for them.

* * * * *

Regarding the projection of "colour photography" transparencies, I had hoped that Mr. Ives would by now have placed on the market his apparatus for showing the beautiful results he obtained himself by means of three coloured screens and superimposed projection. If he is not sharp, except as a scientific result or example, I fear he will not find much call for it, for I recently saw some beautiful examples in single transparencies projected in colour. At present I am not in a position to give details, but before long a public exhibition will be given, and the inventor and producer of these beautiful specimens promises to satisfy the most sceptical. He assured me that no pigment, dye, or colouring matter of any kind, was used, and, as far as I could see the transparency in the stage of the lantern and the resultant picture on the screen, his assurance seemed fully borne out. A little longer time to complete certain details and secure protection for the process is asked for.

G. R. Baker.

DISSOLVING VIEWS WITH ELECTRIC LIGHT.

A few weeks ago, in the course of a paper on *Painters as Judges at Photographic Exhibitions*, Mr. Alfred Maskell, referring to lantern slides, said he finds it "difficult to be serious in applying the term (art) to these very mechanical and easily made transparencies." I am afraid his opinion of dissolving views would be something appalling, but all men cannot live by art alone, or the animated photographs would not be having such an innings, and the majority of those who go to lantern shows do not consider they are being properly treated unless dissolving views are the order of the evening.

The electric arc light is, *par excellence*, the light for the lantern wherever it can be obtained, and its use is rapidly spreading as fresh tracts of land are being included in the electrically lit domain; for not only is it much brighter and much smaller than its only rival, the lime light, but it is, where suitable current is obtainable, much easier to use, and more satisfactory in its results, provided, of course, a good and reliable form of lamp or regulator be employed. But electric light, as applied to dissolving-view work, has, compared to the lime light, this disadvantage, it cannot be turned gradually off and on. Its intensity cannot be reduced in one lantern and augmented in the other so as to produce the dissolving effect in the manner which is so successfully employed with the lime light. True, by a suitable arrangement of variable resistances, the light from an electric arc can be very considerably reduced—especially if a hand-feed lamp be employed—but a point will be reached when the reduction cannot be carried any farther without the light first flickering and then going out suddenly, and at that point the candle power of the light is still in three figures, so its sudden extinction would mean anything but a gradual dissolving effect upon the screen. Moreover, in the other lantern, where the light is being turned on, it cannot be established at all until sufficient current is applied to produce a light equal to some hundreds of candles; so the question resolves itself to this, that to produce a dissolving effect upon the screen, where electric arc light is concerned—the most brilliant light we have—we must hark back to the appliances used for the purpose when the weakest of our now available illuminants (the oil lamp) was the only one a disposal.

However, there is comfort in the reflection that the double fan arrangement, which became obsolete with the advent of the lime light, and which must now be resurrected, is a far more perfect means of dissolving one picture into another than the turning off of one set of gases while another is being turned on, which at present obtains where the lime light is concerned. It has its disadvantages, undoubtedly, not the least being that both lights must be kept burning at the full all the time the "effect" is in progress. But, with two electric lights, one can be extinguished as soon as the change from one picture to another has been effected, and it need not be relighted until just before the next change is required. However, sufficient electric current must be provided to maintain two lights running concurrently, unless what I may call the "series" system be employed. And this system I will dispose of first, for, though it is undoubtedly economical, there are so many practical objections to its use, that I am afraid it must be regarded as practically "out of the hunt."

When a single arc light is run upon a 100 volt circuit (100 volts is the usual pressure supplied to halls, &c.), an extra resistance has to be employed to absorb the energy which is not required at the lamp. For instance, a lamp taking 15 ampère current would absorb rather under 50 volts out of the 100. The remainder—a little more than half of the total voltage—has to be taken up by the resistance, which converts the energy into heat, that, of course, being quite wasted. Thus, in round numbers, the energy represented by 15 ampères at an E.M.F. of 100 volts—that is 1500 watts—is divided equally between lamp and resistance. So two arc lamps, with the 15 ampères passing through each, and each absorbing its quota of nearly 50 volts, could be run upon the circuit, and the two lights, each as brilliant as the one would be alone, would absorb together only the same power as is required to maintain a single light with its resistance. Consequently it requires precisely the same quantity of electricity—or, in other words, it is just as cheap—to supply a double dissolving-view lantern as a single one.

Now for the disadvantages. In the first place both these lamps must be of the automatic variety, and automatic regulators are, except in the hands of an experienced electrician, very difficult to manage, and very liable to go wrong at critical moments, and even an electrician would find it no easy matter to control the vagaries of two automatic lamps running tandem as it were at the same that he is operating the double lantern. It is practically impossible to keep two hand-fed lamps running in series, for one cannot tell which lamp requires attention when the light burns a little low, for the light of both diminishes equally, and, if the wrong one is trimmed, both are immediately extinguished. With two automatic lamps run in series, all the troubles of one lamp will be quadrupled. Every little flicker or jump which occurs in one lamp—and a few jerks are inevitable with even the best carbons—will be reproduced in duplicate in the other, and, should anything go wrong with the works of one, both will be extinguished. Lastly, both lamps must be kept running during the whole performance, for each serves as a resistance to the other, unless some arrangement of switches be employed by which a resistance can be shunted into the circuit instead of one of the lamps while the other is burning. This would remove many of the disadvantages, it is true, but it might introduce fresh ones, for it is very doubtful whether this shunting could be accomplished without causing a very perceptible flicker of light on the sheet, and many automatic lamps, including the best of all, will hiss and spit in a noisy and most distressing manner for a full minute after they are lighted up. However, here is a scheme for the necessary connexions; it might be worth trying, at all events.

There are more ways than one in which two lamps for working in series, or separately with a resistance, according to circumstances,

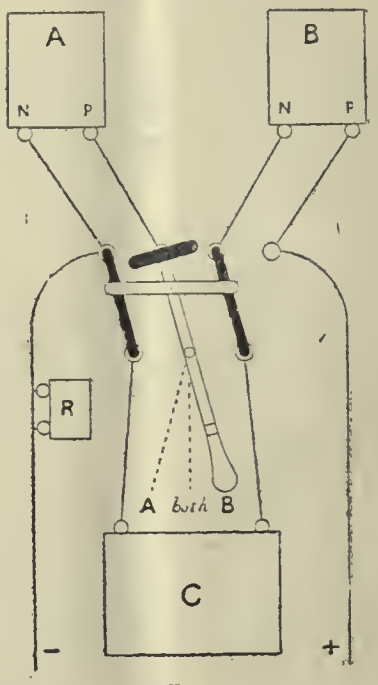


Fig. 1.

may be connected up, but the plan I have sketched out in the accompanying diagram (fig. 1) will, I think, be found to answer all requirements in a satisfactory manner. Referring to the sketch, A and B are the two lamps, which, as before stated, must be automatic. The polarity of the triuniais is marked by the letters N and P. The negative and positive leads are shown at either side of the diagram, the former being connected with the negative terminal of one lamp, while the latter is attached to the positive screw of the other. In the centre of the figure is a double, two-way switch, whose two arms are linked together (by insulating material) so that they may be operated together by one lever between them. This lever also carries a junction piece, whose function it is to connect the two central contact pieces with one another when the switch arms proper are not in contact with any of the studs. C is the resistance whose duty it is to absorb the superfluous voltage when only one lamp is burning, and it has to be thrown in circuit with either lamp alternately to take the place of the one which is not in action. The two uppermost contacts are connected with the positive and negative leads respectively.

When the switch is in the position B, as shown in the sketch, the right-hand lantern only is in action. The current enters by the positive lead, passes the stud of the switch, where there is nothing to interfere with it, and enters the lamp at the positive terminal. Leaving it again at the other it flows through the right-hand arm of the switch into the resistance, which, by the way, must be adjusted to exactly the same resistivity as one lamp. Thence it passes through the other arm of the switch to the negative lead, not

entering the lamp A at all, for there there is no return path for it. On the other hand, when the switch is in the opposite position, the lamp B is thrown out of circuit, and the current passes first through the resistance and then through lamp A.

But between these extremes there is a central position for the switch, when the two arms connected with the resistance have no contacts to rest upon, but the two central studs are in connexion with one another. In this case the current will flow first through lamp B, and then, without entering the resistance, through lamp A; and the two lamps will then be burning in series. The small auxiliary resistance, R, is to control the amount of current consumed when the two lamps are running together.

The method of working scarcely needs any explanation. We will suppose lantern B is in action, the switch being in the position shown. Slide No. 2 is ready in lantern A, whose lens is covered with the fan of the dissolving device. A short time before the change is required the lever is shifted over to the central position, and lantern A lights up without interfering in any way with its neighbour. By the way, the switch should, of course, be fitted with some spring movement to give the usual "quick make and break" action, or the operator will have to be very dexterous to avoid half contacts. Now, the lamp in A lantern having settled down quietly to its work, the dissolving fan can be shifted across, and the "effect" accomplished, after which the switch lever may be pushed to position A, and lamp B goes out.

But, as I have said, this arrangement has its very decided disadvantages to be placed beside its one good quality—an important one, that of economy—and, if reference be made to fig. 2, the alternative

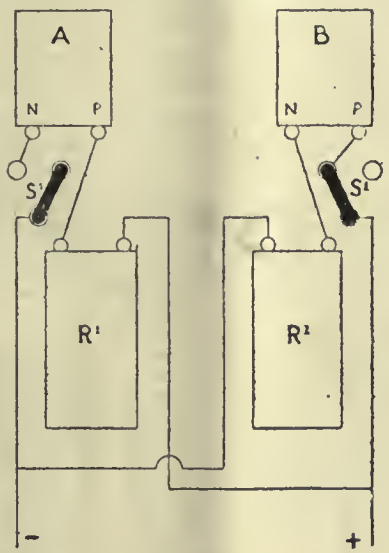


Fig. 2.

method, the *parallel* arrangement as it may be called, will be found set forth in diagrammatic form. The method is so simple that it will not take long to describe it. Each lantern is absolutely independent of the other; each has its separate switch and separate resistance, and each is connected entirely separately with the leads. In this diagram, as in the previous one, lantern B only is in action. Immediately before dissolving — for, as hand-fed lamps can be employed, no time need be allowed for settling down—switch A is turned on, and lamp A lighted up. Then the change of picture is made, and lamp B switched off. It may be preferable, when hand-fed lamps are used, to have each one fitted with an automatic arc-striking device, so that they light up spontaneously directly they are switched on; but in my own practice I do not find this at all necessary. After dissolving, I switch out the lamp which is not required, and immediately turn the switch on again. The lamp, of course, does not relight. When the time comes for dissolving again, a touch of the handle—my lamps are fitted with a "quick striking" device—suffices to re-establish the light, and my hand is ready on the feeding handle, to adjust the length of the arc, if it does not immediately begin to burn satisfactorily.

This system is as simple as it well can be, but it has the disadvantage of not being economical on a 100 volt circuit. It necessitates leads and fuses of sufficient capacity to supply enough current for two lamps, for, though they will only be running simultaneously for a short part of the time, the electrical arrangements must be made as if they were burning together for the whole evening. It remains for the operator to weigh the advantages and disadvantages of the two systems against one another, and to decide upon that whose merits are the greater.

CECIL M. HEPWORTH.

NOTES ON RADIOGRAPHY.

No scientific advance of modern times has called forth such a voluminous torrent of literature, within such a short time of its discovery, as has the Röntgen radiation. The radiographic results produced to-day are a great improvement on those of a few months ago, and many technical advances have been made; nevertheless, we are as far as ever from a solution of the mystery as to what the X rays are, and how they are produced. The number of theories put forward to account for the various phenomena exhibited is growing daily; indeed, they are becoming so bewildering, that to argue the *pros* and *cons.* of each, even in the light of our, at present, limited knowledge, would occupy considerable space. Collective investigation has never been productive of good results, inasmuch as the inferences drawn from the various experiments are in many instances incorrect and misleading; and, even when the results of experiments alone are recorded, they in most cases, have to be repeated before they can be accepted as proven. Not for one moment should the publication of carefully observed facts be discouraged; on the other hand, every indocement should be held out to those workers who are willing to give away the results of their labours. At the same time, no chance should be lost of impressing the willing ones with the necessity of recording the facts as they occur without adding one jot, for the sake of giving verisimilitude to an otherwise bald and uninteresting fact. There can be little doubt that many of the facts (published as such) relating to radiography are not what they appear. I would not for one moment suggest that misstatements have been purposely made with the intention of misleading, but I cannot help thinking that in many instances the wish was father of the fact, and that insufficient care was taken in making records. To those workers who are devoting most of their time to the investigation of this interesting discovery it matters little what statements are made, as they are in a position to pick the wheat from the chaff; but to beginners erroneous statements are a source of great trouble. Only recently I received a letter from a beginner who is in great trouble because he cannot obtain satisfactory negatives of the hand with an exposure of ten seconds. He is using a "focus tube," a coil which gives a continuous four-inch spark, and a very rapid plate, as he had seen recommended in an article. On reading the article in question, I found that the writer stated that under similar conditions he had obtained a negative. What he should have said was that he obtained an image; to call it a negative unintentionally misleads many readers. That he obtained an outline of the hand, and perhaps an indistinct one of the bones, is undoubtedly a fact; but that it was a negative (in the generally accepted meaning of the term) is incorrect, as no amount of intensification or after-treatment would render it sufficiently dense for printing purposes. It is very easily demonstrated that an exposure short of that which is necessary to produce a good, dense deposit, in that portion of the plate which is covered only by the protecting envelopes, is incapable of yielding a negative. A slightly under or over-exposed plate can, of course, be intensified, and may yield a good result.

There are at least two methods of testing the actinic power of the rays, and of finding out the shortest exposure necessary to produce a negative with a given make of plate. The first is by using a Rayometer—an instrument formed of superimposed layers of thin metal, of diminishing size. This I described in the columns of a contemporary a few weeks back. The second method is carried out in the following manner: The outside protecting envelope (quarter-plate) is ruled across with lines a quarter of an inch apart. The covered plate is now placed in position under the tube, the distance between the two being carefully noted. A thick piece of sheet lead, with a straight edge, is now laid over the plate so as to protect all but the first quarter of an inch. This is exposed for, say, ten seconds, when the coil is stopped. The edge of the lead is now moved to the second line and again an exposure of ten seconds is given, and the process is repeated until the whole of the plate has been exposed, when the last quarter of an inch will have had only an exposure of ten seconds, whilst the first will have had 170. The plate should now be developed (if possible with a standard ferrous-oxalate developer) until the least-exposed portion has obtained some density. An examination of the negative will show which portion has been best exposed, granting, of course, that the rays from the tube were sufficiently powerful to produce the best result, in the length of time occupied by the full exposure. If it is thought that none of the exposures have been long enough, the experiment may be repeated, giving exposures of twenty seconds; a half-plate can be substituted; or another quarter-plate can be given an exposure of 170 seconds before the process is repeated. I have found this method exceedingly useful in helping me to form a judgment as to the working of my apparatus, and, if the standard ferroos-oxalate developer be used, together with a timed development, we have a ready means of determining the relative rapidities of the various brands of plates.

In my early experiments I had great difficulty in obtaining a negative from which I could print without some intensification or dodging. Now

however, by making a preliminary experiment in order to test the efficiency of my tube, I can obtain negative after negative from which I can produce excellent prints. I have, moreover, proved that the plate with the highest speed number is not necessarily the best for radiographic work, and that some of the specially prepared ones are far inferior to some of the older and less rapid brands. My best results have been procured upon a plate which is comparatively slow—one which requires from two to three minutes' exposure for a hand. I would most willingly tell my readers what brand I use, but I am of opinion that such advertisements are unfair to other makers, as undoubtedly the personal equation, to a great extent, is brought into play. I may say, however, it is one of the brands which I years ago found to yield the best negative in photo-micrographic work.

The most important subject to radiographers is that of tubes. There can be no two opinions that the so-called "focus tube" is a great improvement upon the older form. There is, however, plenty of room for improvement, and further experiment cannot fail to be productive of good results. The chief faults I have to find with the present tubes are, firstly, that they are too short, hence sparking over and brushing from the terminals is a common occurrence; secondly, that their shape renders them peculiarly liable to be pierced by sparks; and, lastly, that in many instances the platinum loops are too thin. The first difficulty is easily overcome by prolonging the end of the tube to such a length as to render sparking across impossible. This may be done by welding a glass tube into either end, the conducting wire being fixed inside this with some non-conducting material. I have tried this method with success. Under ordinary circumstances, the brushing from the end of the tube is a matter of little moment, but for surgical purposes it should be made impossible, for not only is it painful to the patient, but it is liable to make him jump, and thus to endanger the safety of your apparatus. I see no reason why all "focus tubes" should be made the same shape; and, further, as all those I have spoiled have been pierced by sparks at the angle formed at the junction of the portion which contains the cathode pole with the main bulb, I would suggest that the shape be altered. At this angle the edge of the concave cathode pole comes very near to the glass, and, as the angle appears to exert some resistance to the free passage of the spark over the tube, it might be done away with with advantage. I would suggest that the shape of an elongated egg would offer less resistance, and that the cathode pole need not then come so near the surface of the glass.

It must fall to the lot of very few amateurs to be able to experiment in the manufacture of tubes, hence our progress in this direction is not as rapid as it otherwise might be; nevertheless, there are many makers who would be willing to fall in with any practical suggestion. There is therefore no reason why such suggestions should not be brought forward. A more powerful tube would, at any rate, place increased facilities in the hands of the surgeon, as it would enable him to work at a greater distance from the photographic plate, and one of the chief difficulties in the way of obtaining satisfactory radiographs of the thicker parts of the body would be removed.

Whilst upon the question of tubes, I should like to inquire if experiments have been made with the object of finding the most suitable and best metal for use in the construction of the anode pole. That platinum answers well will undoubtedly be admitted, but there is no reason why some other metal should not be better. Has silver been tried? My experiments have proved that this metal is more opaque to the rays than platinum, hence it might answer better. Again, I would suggest that the metals uranium and tungsten should be tried. That we at present know very little of the conditions which enable us to obtain the best results from our tubes is obvious from the contradictory statements which have appeared in print. That temperature has some effect is certain, but to what degree is a matter for further observation. A few weeks ago I arrived at the conclusion that the height of the barometer had an effect, and I made several experiments in the hope of obtaining conclusive evidence. During this period, always using a spark of the same length, the tube sparked over some days, whilst on others it carried the twelve-inch spark with ease. My calculations, however, have been entirely upset, for, during a later period of ten days, with constant changes in pressure, it has not once sparked over. From these experiments I can only conclude that these variations in the working of the tube are due to some changes in the tube itself. I may say that the tube in question is not a new one, and that it has been in use for upwards of four months. It was originally intended to be used with a two or three-inch spark; it now carries a twelve-inch spark with ease. I have several times seen it stated that the fluorescence of a tube is no guide to its working power. In my experience this is incorrect, as I am invariably able to judge my exposure by noting the amount of fluorescence. The coil I am using has a mercury contact-breaker, which can be so adjusted that any number of breaks can be obtained at will. I at one time imagined that the intensity of the rays was in direct ratio with the number of breaks, and I spent much time in trying to devise an arrangement that would give more rapid breaks. I now find, however, that a certain but variable number of breaks yield the best results. The number varies considerably with the state of the tube, and I find that best suited by noting the amount of fluorescence. This I consider to be an observation of some importance, and shall hope to communicate some further particulars when I have continued my experiments.

The question of shortening the necessary exposure by radiography through the back of the plate whilst the front is in contact with a card coated with some fluorescent substance has been carefully gone into, and with fluor spar, which has been specially recommended, I fail to note any advantage. I have repeated the experiment many times, using a card which only covered half the plate, and I have failed to mark any difference between the two halves. In using the card above the plate there was a slight difference, but this was more than counteracted by the resistance the fluorescent substances offered to the passage of the rays. I find that tungstate of calcium is exceedingly opaque, and offers a resistance nearly equal to that offered by iodoform, which has been mentioned as being unusually resistive to the X rays.

The following experiment, although yielding a negative result, may open up a field of research which is new. I wanted to ascertain if the X rays would act in a similar manner to light, upon a plate which was exposed under the same circumstances under which the colour photographs of M. Lippmann are produced. For this purpose a plate was backed up with mercury, and several pieces of coloured glass were placed upon it. From my previously gained knowledge of the action of the X rays, I expected a negative result, nor was I disappointed. I may mention, however, that the plates were not specially prepared, so that the experiments were not tried under the best conditions. I failed to notice any difference in the amount of deposit in any instance, the various coloured glasses being of the same thickness; and, moreover, when the negative was again backed with mercury, there was no sign of colour. I, however, discovered that the necessary exposure was considerably reduced. I should like my radiographic readers to repeat this experiment and to publish their conclusions, as it seems to prove that mercury has the power of reflecting some of the rays, a phenomenon I have not observed with other metals.

I have made a lengthy series of experiments with the object of ascertaining the penetrability of various metals, but, owing to the extreme difficulty of obtaining the various metals in sheets of the same thickness, I have been seriously handicapped. Sheets have been chosen as nearly as possible of the same decimal gauge, and, although it has, so far, been impossible to obtain accurate measurements, they may be roughly placed in the following order.

List of metals, placed in order of the resistance they offer to the passage of the X rays: Aluminium, steel, zinc, tin, copper, nickel, brass, platinum, lead, and silver.

The brass in the above list is composed of copper, 63 per cent.; zinc, 37 per cent., with slight impurities, in all about ·03 per cent. The thickness of the sheets used was as near as possible 4 metal gauge, or ·012 decimal gauge.

The order in which the above list of metals is placed is only approximately correct, and it will be necessary to make accurate measurements before an absolutely correct list can be drawn up; it is, nevertheless, sufficiently near the mark for all practical purposes.

During the progress of my experiments upon metals, I have noted an interesting point which I have not seen mentioned. It is a well-recognised fact that variations in thickness can be radiographed, and it is quite possible (using great care) to obtain a mixed image of the two sides of a coin. But this is not all; for, if a sheet of metal be dented, even so slightly as not to render one part thinner than another, this indentation can be pictured. If a radiograph be taken through the metal covering from the top of a bottle of pyrogallic acid, for instance, the lettering and trade mark will stand out as plainly as if it were photographed in the ordinary way, with a camera and lens. I at first thought that this phenomenon was due to the fact that, in the process of pressing up the image, the metal was considerably thinned in certain parts. I disproved this theory in the following way. A small piece of thin foil (a mixture of tin and lead) was pressed down upon a medal with the ball of the thumb, not sufficient force being exerted to stretch and thin the metal. I succeeded in radiographing the raised image with ease, and, on carrying out this method, with care, I find I can obtain an image of any medal I may desire to copy. I then came to the conclusion that the production of the image was due to the varying distances of the surface of the pressed metal, from the photographic plate. This theory I still hold, although it is just possible that the phenomenon may be due to an entirely different cause, viz., to some special property exhibited by the X rays in passing through curved substances.

To try and ascertain the truth of the matter, I took two small pieces of sheet lead, about one-fortieth of an inch in thickness. These I lightly pressed upon a brass ring, so as to slightly raise a ring on each piece. I now placed both pieces upon a covered plate. One I placed with the raised ring towards the plate, the other with the raised surface towards the tube. On examination of the negative I failed to find any difference between the two images, and, had they not been marked, I could not have told one from the other, although in both instances the rings were perfectly distinct. This experiment would tend to prove that the last theory mentioned is the correct one.

When radiographing through a number of substances upon one plate, unless great care be taken in making notes, there is always a chance that one may be mistaken for another unless they are marked immediately. This difficulty is, however, easily overcome by marking at the same time as the radiograph is produced. The method I have adopted answers so well that I can safely recommend it to others. Having arranged my

substances to my satisfaction, I then take a strip of thin sheet lead or copper, and cut from it smaller strips, which I arrange under the objects so as to form Roman numerals. These, of course, photograph, and there is no chance of making a mistake. I adopt the same method also in numbering my negatives.

In radiographing the hands, feet, and various parts of the body, it is frequently a matter of some importance that accurate measurements should be recorded at the time of producing the negative. To facilitate this, I have devised the following apparatus, which answers its purpose very well. A square wooden frame is made, round the edges of which small sprigs are driven in at a distance of an inch apart. Thin brass wire is now stretched across from side to side and from end to end, so as to divide the whole surface into inch squares. This frame, which should be considerably larger than the plate it is your intention to use, is placed over the covered plate so that the wire is close to the envelopes. If the hand be placed over this, the resulting negative will plainly show the squares, and accurate measurements can be made at a glance.

From a surgical point of view, radiography is fast gaining ground, and in many instances it bids fair to supplant the older methods of diagnosis.

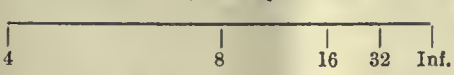
The chief difficulty which at present lies in the path of the surgical radiographer is that of not being able to properly interpret the results when obtained. This, however, will be overcome in time. An extended investigation with the object of ascertaining the varying appearances of radiographs of pathological specimens, the exact diagnosis of which has been confirmed, cannot fail to add to our knowledge, and will render us better able to judge of the condition of things in the living body.

Having already occupied much of your valuable space, I will conclude with the hope that these hurriedly written and disjointed notes may prove of use to some of your readers.

HALL-EDWARDS, L.R.C.P., F.R.P.S.

FOCUSSING SCALE FOR HAND CAMERAS.

IN the *Photographic News* the following rule is given for the construction of a focussing scale for hand cameras: "Focus a low-lying cloud or other object on the horizon, and make a mark to show the extension of camera. Now focus on an object 4 ft. distant, and mark the extension of camera. Exactly midway between these two points will be the extension for 8 ft., midway between the 8 and infinity



marks will be the distance for 16 ft. The intermediate distances can be found in exactly the same way."

This is certainly very simple, but unfortunately the extension for 8 ft. will not be "exactly midway between these two points," neither will the intermediate distances be correct if determined in the same way.

If, for example, we take a 7-in. focus lens and proceed by the above rule, we shall obtain a scale like this:—



The point marked 4 will be 1·195 in. from the inf. mark, therefore, the 8 mark will be ·5975 from it; but the focus of a 7 in. lens, for an object distant 8 ft., is 7·5506; consequently, the 8 point, as determined by the above rule, is about $\frac{1}{20}$ in. too far from the inf. end of the scale. If examined, the other points will also be found to be improperly placed, because, if these posterior foci are in a geometrical progression, their conjugates will not be so.

To correct the above rule.—Instead of writing 8 at the $\frac{1}{2}$ mark, put 8 *minus* focus; instead of 16 at the $\frac{1}{4}$ mark, put 16 *minus* 3 foci; and, instead of 32, put 22 *minus* 7 foci, and so on.

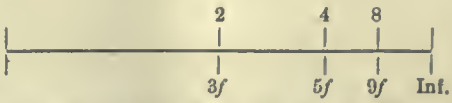
The number of foci to be deducted may be easily determined, because they are always unity added to double of the preceding figure; thus, 1 *plus* twice 3 = 7; 1 *plus* twice 7 = 15; 1 *plus* twice 15 = 31, &c.

The corrected scale for the 7-in. focus lens will be, therefore,

instead of	8 ft.	put	8 ft. *minus*	7 in.	=	7½ ft.
„	16 „	„	16 „	„	21 „	=	14 „
„	32 „	„	32 „	„	49 „	=	28 „
„	64 „	„	64 „	„	105 „	=	55 „

Another accurate and more simple rule, which only requires the focal length of the lens to be known, is as follows:—

Lay off the focal length of the lens from the focal point (inf. mark), thus—



Then halve and quarter it, &c., as before, writing over the divisions, 2 for the half, 4 for the quarter, 8 for the eighth, and so on. Below these write a figure which is one more than the one above it; thus, under the 2 write 3, under the 4 write 5, and so on. Then the focal length of the lens (in inches), when multiplied by these lower figures, will denote the respective conjugate foci in inches.

Example.—Construct a focussing scale for a hand camera, the focus of its lens being 5 in.

As in practice, the marks at 2 and 4 will hardly be required; we may begin by laying off at once the $\frac{1}{8}$ of the focal length for the 8 point, and halve it for the 16 point, and so on. Thus—

Distance from Inf.			Number.	Conjugate focus.		
$\frac{5}{8}$	=	$\frac{1}{8}$ of focus	8	9*f*	=	3¾ ft.
$\frac{5}{16}$	=	$\frac{1}{2}$ the preceding	16	17*f*	=	7 „
$\frac{5}{32}$	=	$\frac{1}{2}$ „	32	33*f*	=	14 „
$\frac{5}{64}$	=	$\frac{1}{2}$ „	64	65*f*	=	27 „
$\frac{5}{128}$	=	$\frac{1}{2}$ „	128	129*f*	=	54 „



EDWARD M. NELSON.

FLASHLIGHT PHOTOGRAPHY.*

[Australian Photographic Journal.]

THE framework having been made or purchased, a few words about the lamps may not be out of place. Although most of my pictures have been taken by means of penny pipes, I by no means undervalue the various flash lamps now upon the market. The pipes will give sufficient light for all ordinary purposes, their only drawback being the extra trouble necessary in preparing them for work. The chief point in their favour is their cheapness, so that, if one has a desire to "try his hand on" flash-light work, he has a very inexpensive mode of procedure. Should he succeed, he can then "launch out" as extensively as he pleases. Latterly, I have had some simple lamps of my own design made by a tinsmith which work with less trouble, although the results are no better than before. Each experimenter must choose for himself the lamps which give the best results in his hands.

I will suppose the reader desires to "take a flashlight." Having chosen a good brand of instantaneous plates, it will be necessary to "back" the same before use, otherwise every highly polished piece of furniture, mirror, glass, or white article in the room, will most certainly cause halation and ruin the photograph as a picture. I have used several methods, but for simplicity I think nothing beats the following: Expose sensitised paper—P.O.P. preferred, although albumen will do—to daylight until very dark. Do this in the shade, or it will bronze and cause a reflecting surface. Over-exposed prints might be treated thus and saved for the purpose; cut paper to size of plate and wash for ten minutes to remove all free silver. Partially dry between blotting-paper, and dissolve a little fish glue or gelatine in warm water, just sufficient to make it tacky. Having sponged the surface of darkened paper with this, lay the plate face down on any dark smooth material before a dull ruby light, place paper in position, cover with blotting-paper, and squeeze the two surfaces into contact. Do not use too much moisture or it will run under the edge of the plate. Should the paper overlap, it may be easily removed by drawing the edge of a knife along that of the plate and pulling off surface paper. If the plates are to be exposed and developed the same evening, they may be placed in the slides at once, otherwise they must be thoroughly dried in a dark cupboard or chest before use. If used wet, the paper is easily peeled off before development; but the plate must be placed in water for a few minutes to soften backing if dry.

The next thing is to arrange your picture, and here a difficulty may arise. If in your own house, and you are the "white-headed boy," you may possibly do as you please and turn the room inside out, if necessary. If so, get rid of all the furniture not absolutely necessary to the proposed picture, or introduce other pieces from somewhere to make the surroundings more appropriate; but, when "flashlighting" in other people's homes, you may not feel so much at liberty to give the necessary trouble. However, by a little tact one can get his own way within reason. First

* Continued from BRITISH JOURNAL OF PHOTOGRAPHY, p. 584.

choose the spot for the camera. This, for an ordinary sitting room, will be in or near the corner from which the prettiest picture will be obtained. Then remove all large objects out of range, especially if they be in the foreground and likely to obstruct the view or throw deep shadows across the room. The less furniture the better. Having arranged this to your satisfaction, set up the camera so that it stands about four and a half feet from the floor. If higher, you will have too much wall and ceiling, and not enough floor space. Carefully level camera, and see that back and front are both perpendicular with the walls. A universal camera level placed on the baseboard will greatly assist in this matter. Any good R.R. wide angle lens will do provided it is suited to the size of plate used. My whole-plate flashlights are taken with a one-sixteenth inch wide-angle Voigtlander; the half-plates, with an ordinary Watson's half-plate R.R.

If possible, the camera should be set up, and focussing done by daylight, as it is rather difficult to do it at night. Failing this, get a friend or assistant to hold a lighted candle in several parts of the room at different distances from the camera; at the extreme edges of picture as seen on ground glass; in the centre of foreground, and at the extreme distance. The flame must be brought into sharp focus in all these spots, the lens being stopped down until this is so. Use as large a stop as possible consistent with sharp definition. The larger the stop the softer the picture, but too large a stop tends to flatness, fog, and fuzziness. Experience will soon enlighten one on this point. Have as much gaslight as possible, both while focussing and during exposure, so that the flash will not startle the setters so much as when it takes place in a darkened room.

Having arranged the camera, &c., the lamps next claim attention. Erect the framework and connect up the lamps with tubing, as directed in last article. Its position should be from ten to twelve feet to the right or left of the camera, but not right in the corner of the room. This will not occupy many minutes, as the lamps, having once been affixed to the arms, will always remain in position. The lower arm (with the two lamps) should extend towards the camera, the upper (with three lamps) extended nearly parallel with the side wall, slightly tending toward the same. The object is to throw a good *side* light with a weaker one from the front. This will prevent harshness and give roundness to the figures. Should commercial lamps be used, full directions for charging them will accompany their purchase. CHAS. GRUNCELL.

ACETYLENE.

AT the last ordinary meeting of the South London Photographic Society, held at Hanover Hall, Hanover-park, Peckham, Mr. W. F. Slater (Vice-President) in the chair, Mr. C. Hoddle attended, and gave a demonstration of the uses of

ACETYLENE GAS.

He said calcium carbide (Ca C^2) was a very hard, greyish substance showing a purplish lustre when freshly broken. It was composed of common lime and carbon in any form such as hard or soft coal, coal dust, or coke, fused in an electric furnace at a temperature of between 4000 to 5000 degrees for about eight hours. The carbide so produced had only to be brought into contact with water, when a double decomposition took place, the oxygen of the water combining with the calcium forming white lime which is left as a residue, and the hydrogen of the water combining with the carbon forming acetylene. Acetylene is a rich hydrocarbon gas (C^2H^2), its component parts being 92½ carbon, and 7½ hydrogen in 100. "In my first experiments I used Bray's 000 burners, which were fairly satisfactory, but later on I succeeded in getting 0000 and 00000 burners. Bray's are now making a special burner for use with acetylene, but I do not consider them perfect, as there is always a deposit of black carbon on the nipple when it has been in use a little time, but that can be cleaned off with a pin or penknife, or, better still, a rather hard tooth brush." The demonstrator then charged up a generator specially designed for use with the optical lantern, and explained, in detail, the various steps for the production of the gas, and the essentials for obtaining a good, steady light. The uses of the gas for portraiture and other photographic processes were also explained, and in conclusion the demonstrator stated that, in his opinion, acetylene would eventually supersede gas and electricity for lighting purposes. Samples of Gem lantern plates and Argura paper were distributed.

KINETOSCOPIC PROJECTING APPARATUS: MR. G. RICHARDS' IMPROVEMENTS.

THE patentee states that his invention relates to a machine for enlarging and projecting small pictures on to a screen. The machine is used to enlarge that class of pictures taken on what are known as films, on which a large number of small pictures are taken consecutively of an object generally while in motion. As a rule, about 450 of these pictures are taken of an object, thus forming a picture in its complete shape. "The object of my invention is particularly to obtain extreme accuracy of register and movement of the film, so that the pictures projected on the screen and enlarged generally about one hundred times will not present the unsteadiness which is now usual in this class of machine. It further relates to the movement of the films by improved mechanical methods. It also relates to means of dealing, or moving, or handling the films to advance and stop them at stated periods of time in such manner that there are no strains brought to bear on the films, to elongate them or distort them or destroy them, or in any way to cause the wear and tear of the films which is now common in these machines. In order to assist in the care of the film and to reduce the wear and tear of it, my invention relates to an improved form of spool for carrying and protecting the film both before being shown and after it has passed through the machine. The film or a number of films are wound on to a spool having side plates of sufficient diameter to suit twelve films each fifty feet long. The side plates of the spool are loose, to revolve independently from the spool. When the spool is placed in position on the machine, the side plates are held from rotating, by which means the film has only to revolve the light spool. My invention also relates to the arrangement of the frictional device for moving the spool to carry the film so as to combine the motions of unwinding and winding of the films as they pass through the machine."

After describing and illustrating the mechanism, Mr. Richards claims:

In machines for enlarging and projecting small pictures on to a screen:—

1. The employment of two wheels or rollers over which passes a film bearing a series of pictures, and between which rollers the film is brought opposite a lens, such wheels or rollers being driven by a gear wheel common to both.

2. Mounting one of the wheels or rollers referred to in the preceding claim upon an adjustable arm pivoted on the centre of the wheel by means of which both wheels or rollers are driven.

3. The combination with the arrangement set forth in Claim 1 of a "drunken worm" for actuating the gear wheel which drives the two wheels or rollers over which the film passes.

4. The employment of a friction device for driving the spool on which the film carrying the pictures is rewound.

5. Making the body of the spools separate from the sides, and mounting the latter on the body so that the body can turn independently of the sides, in combination with means for locking such sides when the spools are mounted on their spindles.

ANIMATED PHOTOGRAPHS IN NEW YORK.

THE public interest in the Vitascope and Cinematograph Exhibitions, alluded to in our August issue, shows no signs of abatement. A recent visit to the New York theatres, where these instruments are in operation, reveals the fact that the exhibition of motion on the screen is the most appreciated part of the whole performance. "The theatres are packed at the time announced for the exhibition," says *Anthony's Bulletin* "and it looks as if the interest would be maintained throughout the whole of the coming theatrical season. The great advantage, of course, lies in the possibility of varying the programme from week to week and illustrating events that are occupying public attention. The troubles arising from vibration in the camera have been overcome, and all that now remains is for more careful attention to be given to the development of the positive films. A little filling up of transparent spots would be beneficial. But this successful portrayal of motion on the lantern screen is an immense advance, calculated to stimulate inventive genius, and to have no little effect on the future of photography. The vitascope creates a demand for a perfect rollable film, and a demand that will have to be met with an article beyond reproach. The amateur photographer, who made the vitascope possible, will thus benefit by it. In the future, instead of a photograph with a frozen and fixed expression, such as are the vogue to-day, a band of pictures some 150 feet long, on an extremely thin flexible film, will be presented to us by the photographer. This will be placed in our table kinetoscope, and a picture showing some life and expression will be at our command. A stereoscopic table instrument for viewing objects in motion would be a success."

EXPLOSIVE PROPERTIES OF ACETYLENE.

A PAPER on the *Limiting Explosive Proportions of Acetylene and the Detection and Measurement of the Gas in the Air* was read at the British Association by Professor F. Clowes. The detection of small proportions of the gas would not, he said, be readily effected by its smell when prepared in a state of purity, and the smell would not in any case furnish a means of measuring the proportion present in the air. The method applied by him to the detection and measurement of fire damp and coal gas in the air, however, served for detecting and measuring acetylene as well. A small hydrogen flame showed a pale but well-defined "cap" in air containing any proportion of acetylene less than the lowest explosive proportion. When the hydrogen flame was exposed to the air to be tested for acetylene in a darkened space, it was at once tinged yellowish-green. In determining the limits of explosibility, acetylene was mixed in gradually increasing proportion with air and kindled. Air must contain at least three per cent. of acetylene before it could be kindled by flame and the mixture caused to burn throughout. As the proportion of acetylene

was increased the explosive character was augmented. When twenty-two per cent. of acetylene was present, carbon began to separate during the burning. The amount of carbon which separated increased until the explosive character of the mixture disappeared; this point was reached when eighty-two per cent. of acetylene was present in the air.

SNAP-SHOTS AT LIGHTNING.

THERE is just a chance in 25,000 that you will be killed by lightning this summer.

These figures are based on carefully collected statistics, but it need not disturb your coolness during the next thunderstorm to contemplate them. Although the season has already been marked with several notable and tragic accidents, and the prospects are that this year's lightning fatalities will number more than usual, you are in far more danger from trolley cars, and other engines of violent death, than you are of being struck by a bolt from the heavens.

The United States Government keeps tab on lightning as well as on many other things, and it has been ascertained that the average number of people killed in this country by lightning every year is 200. Some other interesting facts have been collected by the weather bureau. In eight years 3519 fires have occurred which were attributed to lightning, and the damage to property was something like $13,000,000. The records show that barns are more often struck than houses, and that houses suffer more than churches. The records also show that more barns were struck in New York than in any other State in the Union. Pennsylvania comes next, and Michigan third.

Many old ideas about lightning have been discarded of late years, since scientific observations have been made of the results of lightning strokes. One old saw that has gone over the board is the familiar one that "lightning never strikes twice in the same place." Lightning not only strikes twice, but many times in the same identical spot, and is the usual, rather than the unusual, thing for two or more strokes to follow the same course during a storm.

The scientific sharps of the weather bureau also tell us that there is no use trying to dodge lightning, and that the time-honoured precautions which our grandmothers solemnly advised us to observe are entirely useless. They say that it is a popular delusion that it is unsafe to stand under a tree, or in an open doorway during a thunderstorm, and they absolutely sneer at the feather-bed and the middle-of-the-room idea. They must be in league with the dreaded lightning-rod agents, however, for they declare that those almost abandoned devices are very useful, and should be placed on all exposed buildings.

Only a few weeks ago one of the most notable tragedies of the season occurred in the upper part of New York. A young couple had taken refuge from the rain under a tree. They were lovers who had quarrelled, and had but a few hours before kissed and made up. A lightning stroke sought them out, and both were killed. Senator Tillman's daughter and a minister who accompanied her were killed in much the same manner only a couple of weeks ago. They were members of a party of excursionists who ascended a mountain near Asheville, N.C., and they stopped under a tree to avoid a wetting from a passing shower. Both were killed by a single stroke.

Another popular idea concerning lightning that has been proved false is in regard to the shape of its course. Until a few years ago every one believed that the path of a lightning bolt was an irregular zigzag, with sharp angles where the bolt took a notion to alter its direction. In all old pictures, where lightning was depicted, a zigzag streak of white was used. For centuries artists stuck to this method, and no fault was found with it.

But photography has shown that there are no angles in the course of a lightning flash. There are curves, but no sharp corners. It is not an easy task to take a snap-shot of a thunderbolt, as you may imagine, but within the last ten years it has been done frequently.

Professor McAdee, of the weather bureau at Washington, is probably the most expert photographer of lightning in the world. For the last two years he has devoted a good deal of time to the work, and he welcomes a thunder shower as enthusiastically as a small boys does a circus. He is well situated for the work, for the Washington monument is sure to draw out an angry flash every time an electrically charged cloud passes over it. Professor McAdee has three cameras trained on the top of the monument every night during the summer, and, whenever there is a thunderstorm, he and his assistants get snap-shots of the bolts.

Were it not for the fact that the shaft is protected by a most elaborate system of lightning rods, it would probably have been shattered long ago. There are four copper conductors, with gold-plated and aluminium-tipped points running from the tip of the monument into a well under the foundations, 600 feet below the capstone.

Professor McAdee has invented appliances for anticipating lightning, and has even made calculations as to the dimensions, horse power, and direction of the stroke. Still, there are many things about lightning which are understood no better than 100 years ago. These are put down as freaks, and the scientific men are puzzling their heads to solve their meaning. They know that lightning always follows the path of least resistance, yet they cannot explain some of its antics.

For instance, at Wooster, O., a two-story bay window was cut away from the main structure of a house as if by a giant's knife. At Norwich, Conn., in 1892, a bolt went into the earth, and jerked out 100 feet of iron water pipe. There have been several instances where bolts have played havoc with gas pipes, melting the iron pipes and igniting the gas.

There is an instance on record of the killing of a man by a lightning stroke where the reason for the course of the bolt was afterwards discovered. The unfortunate victim was sitting in the centre of a large room with all the windows and doors closed, but the bolt came through two upper stories, struck him down, and went through the floor under his chair into the cellar. Upon investigation, it was found that in the attic, hanging from a rafter, and pointing directly toward the man in the chair, had been a saw, while below the man, in the cellar, was an iron crowbar. This unfortunate man simply formed a link in a broken conductor. Upon such incidents as these, story-writers found tales in which the assassin's knife is knocked from his hand, and he is stricken dead by a providential bolt from heaven. Such incidents may have occurred, but there is not one well-authenticated case on record. Still, the lightning stroke is a great help to writers of fiction in disposing of heavy villains.

Lightning is as erratic in its results as in its course. Sometimes it sears, again it shatters. Men have been struck by bolts which have stripped their clothing into rags, melted watches and coins in their pockets, and pulled the nails from their shoes, yet left them but little injured. In other cases persons have been instantly killed, and the bolt has left no sign of its fatal visit, save a small bluish spot on some part of the body. Again, the bodies of victims have been marked in a most curious manner.

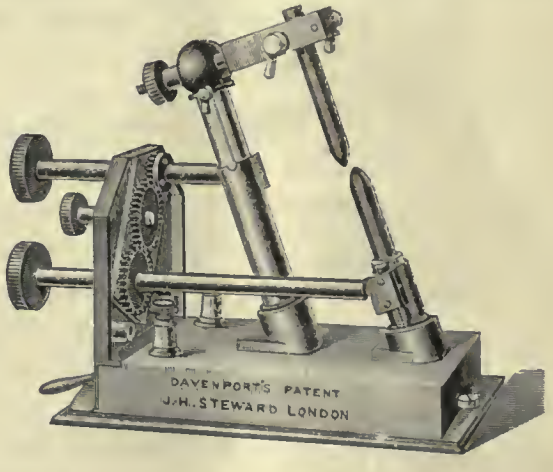
Persons are not always "stricken down," as the much-used phrase has it. They are sometimes lifted up by lightning. An instance of this sort happened in Missouri last summer. Two children were struck in a group of several persons composing a picnic party. The children were lifted three or four feet into the air, and fell back dead. This is explained by the fact that the discharge is sometimes from the earth towards the clouds.

It is also known that a bolt does not always reach the earth, but sometimes returns to the clouds from whence it came. A photograph was taken by an enthusiastic amateur in Michigan of such a return stroke. In the course of another decade, perhaps the scientists who are now making a study of lightning will have discovered all about its wonderful force, and will be able to explain the reason for all the freaks which it now plays on wondering humanity.—CYRUS SYLVESTER, in *Brooklyn Times*.

STEWARD'S IMPROVED ELECTRIC ARC LAMP.

J. H. Steward, 406, Strand.

AN improved model of Davenport's patent arc lamp has been made by Mr. J. H. Steward, of 406, Strand, London, and recently placed upon the market. It has been designed by the inventor to cover all possible uses for projection purposes, and will safely take the stronger



current necessary for high-power illumination. The size of carbons can be either 8 × 10 mm. or 10 × 12 mm., and the method of feeding them by geared wheels is such that they can be made to approach each other at the proper ratio, or, on slightly drawing out the central rod, each carbon can be moved independently. All necessary adjustments are provided to the carbons, and to the base, for perfect centering. The lamp, or regulator, is strongly made, and aluminium is employed for the back and base, to reduce the weight. We understand the Lantern Society use one for the latter part of last session, and the report on its working was most satisfactory.

BUTCHER'S IMPROVEMENTS IN OPTICAL LANTERNS.

Messrs. Butcher, of Blackheath, have patented an improved form of lantern, made entirely of metal, supported on a metal stand that will hold the apparatus firmly on to any beam, joist, tie, chair back, ladder, or any object usually found in rooms used for entertainments, and that will yet allow the light to be thrown in any direction, either upwards, as from a floor to a stage, or downwards, as from a roof to the stage, also from right to left.

The body of the lantern consists of a cylinder of Russian iron, or other suitable metal, of sufficient diameter inside to take the lens to be used. It is long enough to accommodate the jet at the back of the lens. A slot is cut through half the diameter to allow the tinters to slide in front of the lens.

The lens is held in position by a flange inside the cylinder about two inches from the front, against which the back of the lens rests. It is secured by a projection at the bottom, and by a screw passing through the top.

Inside the cylinder or body at the bottom two strips of metal are riveted, to form grooves that will hold the tray firmly that carries the jet. On both sides of the body is a projecting screw fitted with a milled nut, for clamping the body at any angle to the stand.

The stand consists of a metal fork with two prongs upwards. Through the end of each prong is a hole, into which the above two projecting screws fit. The lower end of the fork fits into a tube or socket that is attached to a strong cramp by means of a movable elbow joint clamped by a thump screw. A screw is provided at the top of the tube or socket that will either fit the fork or allow it to revolve freely.

The features claimed in the invention are as follows:—A limelight box made entirely of metal; its cylindrical form; the use of a metal stand as described, for limelight boxes or optical lanterns; for either one or more parts, or for the apparatus used as a whole.

LANTERN NIGHTS AT THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

Slides will be exhibited during the continuance of the Exhibition as follows (the displays commence at 7.45 p.m.):—

Saturday, October 3, slides sent in by Mr. John Gray, *A Photographic Ollapodrida.*

Monday, October 5, slides sent in by Mr. Harold Baker, *Warwickshire Towers and Towns.*

Wednesday, October 7, slides sent in by Mr. Edgar G. Lee, *North Country Scenery.*

Saturday, October 10, slides sent in by Mr. W. D. Welford, *The Hand Camera as a Pictorial Recorder of Holidays.*

Monday, October 12, slides sent in by Mr. Eric Bruce, M.A., a Demonstration of the Aerial Graphoscope, showing Lantern Views in Space.

Wednesday, October 14, slides sent in by Mr. E. Dockree, *Odds and Ends.*

Saturday, October 17, slides sent in by Mr. John Carpenter, *Still Life*, and Mr. George Hankins, *Miscellaneous.*

Monday, October 19, slides sent in by Mr. R. B. Lodge, *Birds Photographed from Life, and Nests.*

Wednesday, October 21, slides sent in by Mr. J. H. Gear.

Saturday, October 24, slides sent in by Mr. Henry Sandland, J.P., *Animal Pictures.*

Monday, October 26, slides sent in by Mr. J. A. Hodges, *Through North Devon with a Camera.*

Wednesday, October 28, slides sent in by Mr. T. M. Brownrigg, *Here and There.*

Saturday, October 31, slides sent in by Mr. F. H. Evans, *Lincoln Cathedral* and *Woodland Pictures.*

Monday, November 2, slides sent in by Mr. G. E. Thompson, *Life in Tripoli.*

Wednesday, November 4, slides sent in by Members of the Photographic Convention of the United Kingdom.

Saturday, November 7, slides sent in by the Manchester Photographic Society.

Monday, November 9, slides sent in by Members of the Amateur Photographers' Field Club.

Wednesday, November 11, slides sent in by Captain W. de W. Abney, C.B., D.C.L., F.R.S. (President).

Leeds Camera Club.—An able and instructive lecture on *The Wet-collodion Process for Lantern Slides* was given by Mr. J. W. Carbutt before the members of the Leeds Camera Club on Wednesday, September 16. The simplicity and inexpensiveness of the process were fully demonstrated. A plate was coated and sensitised, and a slide afterwards produced by contact from a negative the lecturer had brought with him, the development and toning of the same being done during the lecture, the picture being afterwards thrown on the screen. The production of the different tones of slides was fully explained and illustrated on the screen, to show the action of the different chemicals used during the toning process. An interesting discussion took place, and much valuable information was vouchsafed to the inquirers. At the close a hearty vote of thanks was accorded to Mr. Carbutt. On Wednesday evening next, the Rev. J. Beanland will give his popular platino demonstration for beginners.

Catalogue of Magic Lanterns and Accessories.—The London Photographic Supply Company, of 63, Great Dover-street, send us their Lantern Catalogue. It consists of forty-four pages, and is devoted to describing single, double, and triple lanterns of great variety, dissolving lamps, jets, carriers, lantern-slide-making cameras, and numerous accessories required in optical projection work.

An illuminated bird's nest is to be met with in India. The baya bird of that country spends his spare time catching mammoth fire flies, which he fastens to the sides of his nest with moist clay. On a dark night a baya's nest is said to look like an electric street lamp.

Intensity of Daylight.—Mr. Wiesner has communicated to the Academy of the Sciences at Vienna a note on the comparative chemical intensity of daylight at Vienna, Buitenzorg (Java), and Cairo. His observations were made by the Bunsen-Roscoe method, in which the activity of the light is estimated by its power of causing the combination of hydrogen and chlorine. Mr. Wiesner finds that at Vienna the greatest chemical intensity of daylight is represented by 1500 Bunsen-Roscoe units, while in Java it was 1812 units. At Vienna the intensity at noon is on the average less than the maximum for the day in the ratio of 1 to 1·08, whilst in Java the corresponding figures are at 1 to 1·22. The annual range of light intensity at noon is, under similar conditions, 1 to 2·14 at Vienna, whilst in Java the range is only between 1 and 1·24. In both places the light is less intense in the afternoon than in the morning. At Cairo with a perfectly clear sky a considerable reduction in the photographic intensity occurs near noon, the maximum being never at that period of the day.

Royal Photographic Society's Exhibition.—Our readers should note that during the Exhibition there will be demonstrations of X-ray photography given daily at 3.30 p.m. The Birt Acres Kinematoscope will be shown every evening that the Exhibition is open, at 8.45 p.m. This instrument enables lantern pictures to be projected upon the screen with all the movement of life. Exhibitions of slides by means of the optical lantern will be given every Monday, Wednesday, and Saturday evening, at 7.45 p.m. The Exhibition opens to the public on Monday, September 28, and closes on Thursday, November 12.

Utility in Radiography of Screens of Phosphorescent Zinc Sulphide; the Emission by Glowworms of Rays traversing the Needle Paper.—"I substitute for the simple fluorescent screens of barium platino-cyanide, calcium tungstate, &c., a screen of my phosphorescent zinc sulphide," says Mr. Charles Henry, "covered with a leaf of 'needle paper,' and I lay on the paper the object to be radiographed. After some minutes' exposure to the radiation of the Crookes' tube I remove the screen into the dark chamber; the depressions of the objects, opaque to the X rays, appear black, and the transparent parts appear light. I can study the minutest details of the image for a quarter of an hour at least. On gently heating the screen with a source of dark heat, I can continue this examination longer. This method, which allows of a great economy of electric energy and of tubes, may be recommended for exhibitions, lectures, and all cases where it is not required to preserve the radiographic specimen. Phosphorescent zinc sulphide is incomparably more sensitive to the X rays than is calcium sulphide. If we expose for five minutes to one and the same radiation from the tube, a plate enamelled with calcium sulphide and a screen of zinc sulphide, the former scarcely shines, whilst the latter is near its luminous saturation. During the last evenings I have had occasion to place, during times varying from half an hour to several hours, some glowworms upon photographic plates wrapped up in needle paper; on developing, we could distinguish on the plate black-and-white tracts which reproduced exactly the course pursued by the subventral lanterns of these capricious animals."

From recent researches by Captain Abney, it appears that the light energy obtained from the sun is about 13,000,000 times as much as that obtained from the stars in both hemispheres, and that the moon gives about forty-four times as much light as the stars.

To Remove Red Spots from Plate Glass Slides.—These are due to the oxide of iron polishing powder, left adhering to the bottom of the deeper pits, made in grinding the glass surface, and which have not been removed in the polishing operation. Sometimes they are too numerous and conspicuous to be tolerated. A short rubbing with whiting and water will clean out the red matter more quickly than acid treatment. The pits will be left, but they will not be so noticeable as before, and, in case a mounting medium is used having nearly the same refractive power as the glass, they might escape observation.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*November* 6, 1896.

THE LANTERN RECORD.

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LANTERN MEMS.

The number of societies has been reduced by one, for the Lantern Society has ceased to exist. In many respects this is a pity, for it should have found a useful place in the optical lantern world. Its failure was due, first of all, to coming into existence too late, when so many photographic societies had already formed lantern sections; and, second, the subscription being set too high for a distinctly technical society, where research in connexion with it was very limited. It is easy to be wise after an event, but it would probably have served a more useful purpose as a school for operators, where members in rotation would have the opportunity of manipulating biunial or triple lanterns, as well as making demonstrations with special apparatus under competent guidance. One thing is certain that if attention and enthusiasm on the part of the Chairman and Executive counted for what it was worth, it should have succeeded as a Society.

* * * * *

The calls on the time of most men in the scientific world, such as literary men, opticians, &c., is such that they cannot possibly attend all the societies' meetings they would like to, or desire, even in order to keep *au courant*, and so it comes about that, unless some distinctly marked demonstration is to take place, they do not attend. In the case of the Lantern Society, it was thought that, if certain members would guarantee to introduce a new member annually, or be responsible for another subscription, it might give the necessary vitality for its continuance, but only a small number (I think) acquiesced, and therefore nothing remained but to wind up the affair, the apparatus being sold by auction.

* * * * *

This result brings forcibly home to one the thought, often expressed, that there are too many societies for practically the same purpose, and I should like to see an amalgamation of some of the societies at a really convenient meeting house in a central position. This would obviate the necessity of the same paper being read at several societies, or new apparatus being taken to, and described at, several places to a certain percentage of men three or four times over because they belong to a club and those societies as well.

* * * * *

That colour photography is creating some interest in the pages of this Journal the editorial and Correspondence columns show; and, in order that my "Mems." may be up to date as far as Mr. Bennetto's process goes, I wrote to him at Newquay, asking if he had anything to add to the information he gave me personally when there in September, and I have the following notes, which I have no doubt he will not object to my publishing, for, although they set matters in a clearer light than anything hitherto made known, they do not give details that will enable any one to anticipate the publication of his method.

* * * * *

He says: "Regarding your query, I do not know there is much more information I can give you, except that the method described by Mr. Ives, and communicated in The British Journal of Photography, does not in any way resemble my own. I worked the same thing out in 1891, and have written and told the Editor so. It is useless, the images (three) produced by the bichromate alone making quite a strong positive, and producing a monochrome effect upon the colours, destroying the colours and their truth to the original, besides which, the image cannot be perfectly sharp."

* * * * *

Regarding the colour transparencies that I saw in the optical lantern and projected on the screen with really beautiful effect, he adds: "The perfect pictures by my improved method are less in thickness than an ordinary positive film on a lantern plate, and will not be on glass at all, but supplied or produced as fine films." Mr. Bennetto has also designed and produced a suitable support and frame for using them in the lantern, so that the heat does not affect them. I feel sure all lanternists and photographers are looking forward to the time when Mr. Bennetto can either supply some of these films or grant concessions for making them.

* * * * *

I said to a lantern-slide artist the other day, when telling him of these results, that his occupation, like Othello's, would soon be gone. However, from the class of work that finds its way into slide-painters' hands, there is not much fear of this happening, for numbers of subjects are still required that cannot be taken from nature, and these would keep them well occupied, besides which there would be the preparation of dissolving views and effect slides.

* * * * *

It was only natural that Mr. G. A. Storey, A.R.A., should at his lecture at the Camera Club on *Colour* speak in favour of his art; and, as I understand, the paper was listened to with great interest by a large number of members, I trust that a fair percentage of them reciprocated the feelings of the lecturer when he said he considered "colour as necessary to a picture as gold was to a guinea." If they did, it will produce a good effect, I trust, and remove some of the prejudice often expressed—something to this effect, "I would not have a coloured photograph on any account; colouring simply spoils it."

* * * * *

Some kinds of colouring may spoil photographic transparencies, but I contend that, when a good photograph is artistically painted

by an artist who knows the colours in nature, very beautiful results are obtained, but the floating on of colour indiscriminately over buildings and everything else is not at all likely to bring about a pleasing, much less an artistic, result, and this must happen if the so-called colouring has to be done for a few pence each slide.

* * * * *

THE animated photographs are not in any way losing their popularity, but I am sorry to see, in some instances, a disposition to unduly enlarge the tiny photographic representations of life. It would be far better to have a smaller and brighter picture, with better definition, than a large area covered with an indifferently lighted picture, notwithstanding a powerful arc light is employed. Then, again, the love for novelty is such that photographic monstrosities are projected on the screen in some of the street scenes, because the point of view was unsuitable and the perspective abnormally rapid.

* * * * *

TAKEN altogether, the animated pictures are giving satisfaction, and are likely to be popular for some time to come. I learn of at least one large-size film apparatus having been made and successfully employed for taking photographs of historical events, and I trust, by the time the photographic weather comes next spring, several instruments of this type will be available for professional and amateur photographers' use. It would be interesting if some one would read a paper or describe the technique of developing and printing these long-film photographs, and the steps to be taken to obviate frilling or stripping of the transparent films used for projection.

* * * * *

ACETYLENE gas seems to be "under a cloud just now. It will be interesting to have all the facts in its favour and its drawbacks put in a convenient book form, or as notes for reference. At present lanternists who were interested in the light are nervous about it, and are asking for information. G. B. BAKER.

RADIOGRAPHY.

Now that the excessive exacerbescence of the X-ray excitement has waxed somewhat extenuated—excuse me—and the ordinary average man and even woman is able to look upon his or her own skeleton excarnate or rather upon its X-raygraph with equanimity, those photographers who have been waiting until the first mad rush was over may be glad of a few practical particulars as to how to set about the production of those curious photographs.

I call them photographs because that word conveys a more definite idea of their real character than do any of the multitudinous names, fancy and scientific, which have been proposed by their well-meaning godmothers all the world over, and, while the rays by which they are produced are certainly not light of the kind that we can appreciate, and very probably are not light of any kind, still no one has actually proved that they are not, and, as they behave to the sensitive photographic plate precisely as if they were, the result may be fairly called photography until a better name is forthcoming. Seeing is no longer believing, but photographing is, and upon the testimony of our plates we may call this strange radiation light until we know it isn't.

This peculiar invisible light, then, is produced by an electrical discharge *in vacuo*, but under certain conditions, for in the first place it is necessary to have an electrical stress or *potential*, as it is called of very high tension, and, secondly, the vacuum through which this electricity has to force its way, and thereby give birth to the X rays, must also be very high—that is to say, it must be a very nearly perfect vacuum. Potential is that quality of electricity which gives it the power to overcome obstacles tending to hinder its passage. Air at ordinary pressures is an obstacle which, if its potential is high enough, it overcomes by piercing its way through, disruptively as a flash of lightning does. A glass globe containing nothing but air, and having an electrode at either end in connexion with a source of high-tension electric energy, such as an induction coil, may be the scene of a miniature thunderstorm. If the air be gradually drawn out of the globe, the thin streaks of lightning will grow thicker, until, with quite a moderate degree of exhaustion, they will broaden out into a violet glow which will fill the whole globe. As the residue of air is still further drawn from the vessel, the character of the discharge will change, until, at a certain point when a very high degree of exhaustion is reached, the actual light of the discharge will disappear altogether and a peculiar invisible radiation from the cathode will take its place. What this radiation consists of, nobody knows, but it has the power of making the glass vessel fluoresce with a pale green light wherever the rays strike it. Professor Crookes was the first to study the phenomena of electric discharge in such high vacuo, and this effect of green fluorescence in the glass is called after him, and the high vacuum tubes are known as Crookes' tubes.

The cathode is the technical term for the negative electrode, that is to say, the electrode by which the electric fluid leaves the tube. In a Crookes' tube it takes the form of a plate of aluminium, and from this plate the Crookes' radiations, or cathode rays, proceed in all directions. They have the power of making several other substances besides glass brilliantly fluorescent, but these substances must be enclosed within the tube, for the cathode rays cannot pass through the glass. X rays are not the same as cathode rays, and they are not necessarily produced with them. It would seem that, in order to give rise to the X rays of Röntgen, a higher vacuum is necessary than that which is required to produce the Crookes' effect. Moreover, the Röntgen rays do not appear to proceed directly from the cathode, but to be generated at the point where the cathode rays strike the glass.

Since the publication of Professor Röntgen's great discovery there has been no such important step made as that of Mr. Herbert Jackson of King's College, who introduced what he called the "focus tube." Reasoning that cathode rays appeared to be propagated in greatest profusion at right angles to the cathode plate, and that the X rays seemed only to make their appearance where the cathode rays met with some obstruction, he designed a tube in which the aluminium cathode was concave, and at the centre of its curvature he placed a small platinum reflector at an angle of 45° to its axis. By this means the cathode rays appear to be brought to a focus on the small reflector—which often gets red-hot under their action—and from this point the X rays are propagated in the direction in which the mirror faces. With this tube photographs may be made with ease which far surpass anything which could be done with a tube of the older pattern, and this is not to be wondered at when it is considered that the rays proceed from something near a mathematical point within the tube, instead of from every portion of its surface.

The character of the electrical supply to the tube is of the greatest importance; as has already been said, it must have sufficient pressure or power to enable it to force its way across the space between the electrodes—a space which contains as nearly as possible absolutely nothing. As a matter of fact, tubes for the production of X rays are exhausted to about the one-millionth of an atmosphere; that is to say, they would, if opened to the air, contain one million times as much of that substance as they do when they leave the glass-worker's hands; in other words, a Crookes' tube—say three inches long—when ready for X ray work, only contains a mere handful of billions of air molecules instead of about a million times as many.

To sufficiently overcome the resistance of such a tube as this requires very high electro-motive force, but not much of it. Imagine a small water motor, which is very stiff in its bearings; all the water of the Thames would be unable to make that motor work; but take a gallon of the water to the top of the Monument, and lead it from there by a small tube to the motor below, and it will turn merrily for hours. It is small quantity at high pressure that it wants, and so with the Crookes' tube. If you had all the electricity of a big supply station at your disposal, you could not take a single "new photograph," but it is possible to transform a small quantity of that electricity and transform it from its low pressure to one several thousand times as high, and, although the quantity will thereby be proportionately reduced, still there will be plenty for the purpose.

The instrument by which the transformation is accomplished is called an induction coil, from the fact that the high-tension current is *induced* in a coil of wire by the passage of the low-tension current in another and quite separate coil, so the effect is really not a transformation at all. The instrument consists of a coil or helix of thick, insulated copper wire—usually in two or three layers—through which flows the primary current—in comparatively large quantity but at low pressure it will be remembered. Surrounding this as closely as possible is a second coil of very fine copper wire, also insulated, in which the secondary current is induced. The *quantity* of current induced in this secondary coil depends upon the thickness of the wire and the *quality* or pressure upon its length. As it is very high pressure, but small quantity, that is required in this case, several miles of exceedingly fine wire are used. Through the centre of the thick wire or primary coil a bundle of soft iron wires is laid, which serves two purposes; in the first place, the magnetism induced in it by the primary current is an important factor in the production of the secondary or high-tension electricity, and in the second it serves to actuate a contact-breaker; for the induction effect in the secondary wire is only produced at the moment when the current in the primary either starts or stops flowing, and therefore a vibrating contact-breaker, like that on an ordinary electric bell, is necessary to continually interrupt the passage of the current in the primary coil, that the induced current in the secondary may be more or less continuous. The more frequent these interruptions are the better, therefore, the vibrating armature of the contact-breaker should be short and of light weight.

The apparatus and materials for taking an X-ray photograph may be said to consist of four principal items: The sensitive plate; the high vacuum tube wherein are produced the X rays which effect the sensitive plate; the induction coil for producing the high-tension electric disturbance wherewith to excite that tube, and the source of low-tension electrical supply to the induction coil. It is this last—which in the natural order of things should be first—that I want to speak about more particularly.

There are three principal sources of electrical energy which are suit-

able for the purpose: A primary battery; a battery of secondary cells—storage cells or accumulators they are often called, though neither name is good; and the electric lighting supply, which is now to be had at so much a unit at a number of places. Let us take these in the order named.

There are a large number of primary batteries, but only one or two are suitable for this work. What is required is a battery giving an electromotive force of about ten volts, and having low internal resistance, so that a large current may be able to flow around the circuit. A battery of five Grove or Bunsen cells answers these requirements, but the former is very expensive on account of the platinum foil, which is an important factor in its construction, while both have the disadvantage of requiring to be charged with fuming nitric acid, which is always an unpleasant neighbour. The single fluid bichromate of potash cell is better in this respect, but it quickly becomes polarised, and cannot therefore be used for more than two or three minutes at a time. If primary batteries must be used, the choice lies practically between these two, Grove and Bunsen cells are so much alike that they may be counted as one. For ordinary laboratory work, where it is feasible to keep the battery in a well-ventilated cupboard of easy access—for the solutions must be emptied away, and the cells kept clean when not in use—a Bunsen battery will be found the best. On the other hand, where portability and freedom from smell are important considerations, the bichromate battery is the one for the purpose. Five or six cells will be sufficient—such a battery will give about ten or twelve volts—and they should be of large size, that they may not tire too quickly, and may last some time without requiring fresh solution. Remember, however, the size of the cell does not affect its strength; but a large cell has less internal resistance, so that it will allow more current to pass through, and it will, with a given current, last longer, and work for longer periods at a time without getting temporarily exhausted.

It is hardly necessary to say that the cells must be coupled up in series, the zinc terminal of one being joined to the carbon of the other, wires from the two outermost cells only being connected with the primary wire of the coil.

In the case of secondary cells or accumulators, it must be remembered that, when they have done a certain amount of work, they will require recharging with electricity from a dynamo or other source of supply. This is practically their only drawback, for, as regards ease and simplicity of working, they have no rival, for they are always ready to give off their supply of current just as it is required, at the mere turning of a switch. As far as portability is concerned, they are heavy certainly, but if a suitably light form of battery be chosen, not excessively so, and they take up very little space.

In using secondary cells great care should be exercised to prevent them becoming short-circuited even for a moment. The internal resistance of an accumulator is practically nothing, so if the wires should be allowed to come into contact with one another, there would be a great rush of current around the circuit, and the battery would be drained in a very few minutes Even if the contact were only momentary, it would probably do harm to the battery, for secondary cells should never be allowed to exceed the rate of discharge for which they are designed. In order to prevent an accidental short circuit injuring the cells, they should be provided with a "fuse," that is to say, a piece of tin or lead wire should be included in the circuit, which, though large enough to pass the required current, would immediately melt and break connexion should the amount become seriously increased. A piece of number twenty wire gauge, pure tin wire, will fuse at about eleven ampères, which is far more than would be required for a coil of ordinary size.

When ordering a secondary battery for, say, a four or six-inch coil, the specification should be somewhat in this wise: Four or five cells, of about twenty ampère hours capacity, capable of being discharged at six to eight ampères for short periods intermittently. The cells to be as small and light as possible consistent with the high rate of discharge. As regards capacity, the consumer must be guided entirely by circumstances. If he be so placed that recharging at frequent intervals can be easily accomplished, he may choose cells of small capacity and correspondingly great portability; but, if not, he must be content with a heavier outfit. He cannot do better than tell the battery-maker his requirements and be guided by his advice.

The question as to the third source of electric energy for radiography—the ordinary house-lighting supply—resolves itself into a consideration of a suitable and convenient means of connexion with the electric mains, and of the controlling of the current to render it suitable for the purpose. For the pressure of 100 volts—which is the usual potential led into private houses and public buildings—having practically no resistance behind it, would burn up the coil in no time, were it allowed to work its own sweet will unchecked. The way to check it is to place an extra resistance in circuit, for the resistance of the circuit itself, being, practically merely that of the coil, is quite insufficient. A resistance is something which the electricity experiences difficulty in passing, some of its energy being therefore converted into a different form, such as heat or light. German silver wire offers great resistance to the passage of electric currents, much of whose energy therefore becomes converted into heat. Carbon is another substance of similar property and I have found that carbon in the form of incandescent lamps makes the most convenient resistance for this work. A single twenty-five-candle-power lamp will allow about one ampère of current to pass when placed across a 100-volt circuit, but in doing so it will consume all its energy, which takes the form of light and heat; but, if the lamp be connected in series with the coil so that the current must pass first through one and then through the other, the energy will be divided between the two, and, the total resistance being nearly double that of the coil alone, only about half an ampère will pass. So, in order to get our five ampères through the coil, a bunch of ten of these lamps will be required, arranged in *parallel* with one another, but in *series* with the coil, as shown in the diagram (fig. 1). Thus the current will have ten different paths through the resistance, half an ampère going through each path, and uniting, about five ampères in all, to traverse the primary coil.

The beauty of this arrangement is that the amount of current is variable to any required extent, for any number of lamp-holders can be connected up in this way, and it suffices to merely insert or take one out to increase or decrease the current passing through the coil by about half an ampère. In practice I find it best to use four or five fifty-candle-power lamps, each being responsible for about one ampère, and one or two smaller lamps may be used to give the power of finer adjustment when necessary.

Fig. 2 shows a convenient arrangement for a lamp resistance which I have used for some time with considerable success. It consists of a mahogany board 5 × 8 inches, to which are attached eight standard lamp-holders, four on each side. Lamp-holders are made to fit ordinary gas brackets, &c., to which end they are screwed internally with either ⅜, ½, or ⅝-inch standard (gas) threads. Mine were of ½-inch gauge, and, in order to attach them to the board, I used short pieces of ½-inch brass tube, tapped to fit, and these, screwed for half their length into centre-bit holes in the wood, made good, firm connexions. Another, and perhaps better, plan is to use "bottom plate" lamp-holders, which can be screwed direct to the board by means of ordinary wood screws. Down the centre of the board, on the face, run two omnibus bars of copper or brass, and, from four different points on each, spring two wires which go to the two lamps on the right and left side respectively. The arrangement can be easily understood by reference to the sketch (fig. 2), in which the dotted lines represent the paths of the wires at the back of the board,

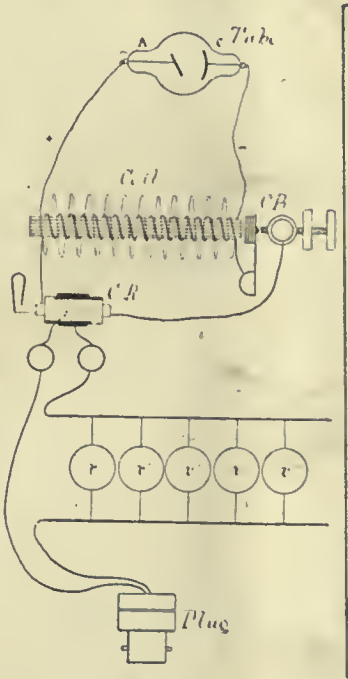


Fig. 1.

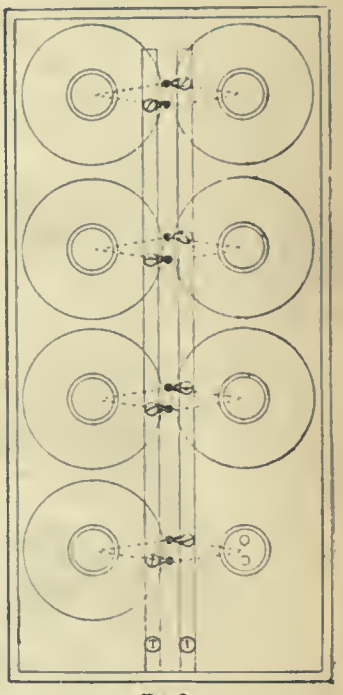


Fig. 2.

and from which it will be seen each lamp is fed independently of any other from the two omnibus bars. In other words, all lamps which are in the holders (in the sketch one is removed) are "in parallel" with one another, but the complete arrangement is connected "in series" with the coil, current reverser, &c., as shown in the connexion diagram (fig. 1).

A simple and convenient way of making electric connexion with the ordinary house mains is by means of a plug to fit the usual standard lamp-holder, when the lamp is removed. Such a plug can be procured from any large suppliers of electric-lighting accessories, and, when the wires to the coil, &c., are joined up, it is merely necessary to slip out the lamp from an adjacent bracket and insert the plug in its place. There is one point, however, which must be carefully attended to, and that is to see that the amount of current it is proposed to draw from the lamp-holder does not very seriously exceed the quantity which the fittings are required to carry. A single sixteen-candle-power lamp is only expected

to take about half an ampère, and, if from its fittings five ampères are taken, it is hardly surprising if a "fuse" gives out somewhere. As a rule, there is nothing to be feared from the wiring of such a fitting, for it is usually substantial enough to carry five ampères for the short, intermittent periods the current is required for coil work. Some fitting should be found, such as an electrolier, in which one fuse does duty for eight or nine lamps; it will then be quite safe to draw five ampères from one, provided the others are not burning at the same time.

In the connexion diagram (fig 1.) the two wires proceeding from the plug pass to o. R., the current reverser of the coil, one of them—it does not matter which—being broken, that the resistance *r r r r r*, may be inserted. Thence one wire goes direct to one end of the primary coil, and the other to the screw pillar of the contact-breaker, c B, the vibrating armature of which is in connexion with the other end of the primary, or thick wire coil. Thus, the primary circuit is complete in itself, and the current is free to travel round it. The two ends of the secondary or thin wire coil are connected to the terminals of the Crookes' tube, thus making the other circuit—the secondary—also complete in itself.

There merely remains one word to say, and that is as regards the direction in which the secondary current flows through the tube, for the cathode must be connected with the negative terminal of the coil. If the current is flowing in the wrong direction, the glass of the tube appears to be covered with a kind of fern like pattern in green, fluorescent light, while the metal work inside will probably rattle ominously. When rightly connected up, the glass should glow equally with a steady green light, all over, except where the anode—the inclined mirror—casts a distinct "shadow" upon it. A very little experience will enable one to tell at a glance whether the current-reverser requires reversing or not.

CECIL M. HEPWORTH.

ON THE REDUCTION AND INTENSIFICATION OF LANTERN SLIDES.

I.

IT is generally admitted that an operator has much greater latitude in working and control over the production of lantern slides, by means of wet collodion or one or other of the dry-collodion methods, than by means of a gelatine lantern plate. No doubt, the reason for this generally accepted opinion lies in the fact that with wet collodion any one who possesses a thorough knowledge of this old but invaluable process can reduce and intensify, and so ring the changes on a collodion picture as to turn out almost any class of image from any kind of negative, and, once possessed of experience in collodion-working, an operator looks down upon a gelatine lantern slide with more or less scorn as an inferior production in every respect. I am far from saying that I hold such a poor opinion of gelatine slides so universally produced by means of a lantern dry plate. Nevertheless, once an operator becomes possessed of the numerous "Kens" attending the production of lantern slides by means of collodion, it is just about ten to one he will be animated more or less with the feeling of preference for the latter, for, no matter how beautiful a gelatine slide may appear in the hand, and very often such have a charming appearance by daylight, it cannot compare on the screen with a carefully executed sample of collodion work. This has been argued over and over again, there is a cut or crispness about a wet or dry-collodion slide that does not exist, nor, in fact is, capable of being produced by means of a gelatine emulsion, and which must ever yield the palm to collodion productions.

On the other hand, there is no doubt that very beautiful results are obtained by means of the modern lantern dry plate, and not the least inducement towards the employment of such for this work lies in the perfection to which dry-plate makers have brought this kind of plate, as well as the low price they are sold at to the public. "It's only a penny, so let us try and get a better result by another one," is a remark not only universally made day after day, but such is carried into execution, to the benefit of the dry-plate maker, and there are thousands of workers who never grudge exposing dozens of lantern plates in the hope of being able to get "one" good slide only from a negative. The preparation of a dozen wet-collodion plates would be a different matter; but, on the other hand, there is no doubt a much greater delight is experienced in the preparation of such plates than can ever be derived from opening a box of dry plates. It is in this preparation that the charm of working collodion lies, and which an enthusiastic worker looks upon with so much pride once he has become proficient in collodion work.

I have sometimes been shown results obtained on gelatine plates, and asked if better results could have been obtained by means of my pet process, so pleased have been the parties with the excellence of their productions. "Yes, if you try both on the screen," is invariably my reply. Then the one that looks the best in the hand will have the worst appearance on the screen.

That lantern dry plates have, however, taken a strong root among advanced amateur workers no one can deny, and, although there does not exist the same latitude when working with such on inferior negatives as lies with collodion, still there *is* more or less latitude that can be utilised in reduction and intensification when an improvement is desired upon a result got by development alone.

The best gelatine slide I ever witnessed was produced by means of reduction and after intensification, and there is no doubt that a great power lies here when an operator knows how to set about improving a flat, over-exposed plate—an operation which in many respects is similar to reducing or clearing away the deposits on a collodion plate by means of iodine, and then finally strengthening the purified image by means of intensification.

Many workers stand aghast at the mere mention of intensifying a lantern slide. Yet such means improve wonderfully the appearance of the slide on the screen, and, when the operation is skilfully performed, there will not be the slightest discolouration or degradation of the high lights. There is always a right and wrong way of doing everything, and, if intensification of lantern slides be conducted properly, great improvements follow such treatment. It is not that intensification is a wrong treatment to submit such delicate work to, as many imagine. The error lies in applying intensification *to all and sundry* productions, without the exercise of discretion whether such should be applied or not. Any slide that is judged too weak or thin by reason of lack of vigour only, but which has all the elements of a good slide otherwise, viz., some portions absolutely free from any deposits, *i.e.*, the highest lights, good middle tints and shadows, will take no harm from intensification if properly conducted.

On the other hand, poor, flat productions which have not a single high light or bit of clear glass in them, and whose half-tones are as sickly as shadows, will certainly suffer if such treatment be applied.

Intensification and reduction of lantern slides is an operation that should always go hand in hand, and the one follow the other as a natural consequence; and, once a worker grasps the advantages such treatment affords in the production of lantern slides, he will have mastered the entire operation, and spoil fewer plates when conducting this work.

Every worker in lantern slides knows quite well that the best negatives will always yield the best slides, but it does not follow that good results cannot be obtained by ringing the changes on indifferent negatives, by such means as partially screening or shielding those portions during exposure, and then, by having recourse to reduction of density, either locally or as a whole after development, high lights of great purity are obtained, that otherwise would be quite muddy or veiled over.

These bright high lights are beauty spots in a slide, and, when they exist, they lend a charm upon the screen that is so delightful to see.

How are these beauty spots to be acquired, however, from negatives where the necessary high-light deposits do not exist to yield such? The answer is very easily given, viz., by strengthening the points of the negative, and a clever worker will do so in an incredibly short space of time, and in a manner surprisingly easy. Let any of my readers who wish to temporarily increase the high lights of a negative just try the effect of applying by means of the tip of a finger a very small modicum of crimson lake *oil* paint to the glass side of a negative at the parts that it is desired to yield greater opacity, and, then by gently dabbing or rubbing the oil paint, it will or can be made of any consistency, and lie perfectly flat and smooth. With such an addition print your lantern slide, and, when all is right, rub it off again, and a stranger's negative never shows the dodge that has been applied. And no judge at a show or any one else that called for the production of the negative could say any retouching or doctoring had been resorted to.

I often think that such strictures, as no retouching or doctoring allowed, so frequently found in some of the conditions attached to societies' Exhibitions, about the silliest of all rules to apply, and such only shows how ignorant the parties are who frame such strictures. Any experienced operator can doctor a negative to any extent, pull prints from same, and remove any of the working up, making it impossible for any one to say that the negative has been doctored. But why should such doctoring not be encouraged rather than prohibited? Any means that will tend to the improvement of results ought surely to be commended rather than condemned, and, were prizes offered for the cleverest system of doctoring negatives, such would tend to teach a lot to those who have but little practical experience in photography. I wonder if an absolutely perfect negative was really ever produced, or one that did not permit of some improvement being effected after the development stage. I have never met such a *beau idéal* in photography.

T. N. ARMSTRONG.

COLOURING LANTERN SLIDES.

WE have always maintained that a photographic lantern slide coloured was a lantern slide spoiled, but an exhibition given in the Auditorium by Major W. H. Coughlin, the well-known Brooklyn artist, of British and American scenery, the slides having been photographed and coloured by himself, changed our opinion. Some of them, says the *American Amateur Photographer*, were so beautiful and so different from anything that we had hitherto seen, that, although aware that the man, in such work, is more than the method, we asked him, for the benefit of our readers, to tell us all about it, and what he said was practically as follows:—

Lantern slides should be tinted rather than coloured, and preferably with certain liquid aniline colours because of their beautiful transparency. Suitable kinds are kept by dealers in artists' materials, and known as

"Egyptian colours," or "Acme colours," and sometimes by dealers in photographic materials under other names. The following list includes all that are necessary for first-class work :—

Sky blue,	Lemon yellow,
Dark blue,	Orange,
Light green,	Brown,
Dark green,	Lilac,
Light red,	Scarlet,

and the general method of employing them, including colour values, contrasts and colour study, is exactly the same as in ordinary water-colour painting.

The colours, excepting sky blue, faint green, brown and light red, are dyes rather than colours in the ordinary acceptation of the term, and, while the slides should be tinted darker than they are wanted to appear on the screen, they cannot, without streaking, be laid on deep enough by one operation, but by several successive applications of the brush, each being allowed to become *nearly* dry before the application of the other. But, although the tints must be darker than they should appear on the screen, they should only be deep enough to be effective, or give due effect to the natural colour of the subject.

The sky of the slide should be perfectly transparent before colouring, coloured a suitable blue, and clouds picked out in white, and cloud shadows made by the application of a grey tint of sky-blue, red and faint yellow. The colours of distant hills are given by an intenser shade of the same mixture.

In colouring trees the whole object should be tinted green, which as purchased will be found too intense, and must be reduced with lemon yellow, and while moist the shadows touched in with a reddish purple.

Before beginning to apply colour the slide should be moistened with a wet brush and allowed to become *nearly* dry, as this makes the application easier and prevents streaking.

As most of the colours are readily decomposed by ammonia, clouds may be put in and errors corrected by its application. In one of the slides shown an effective moon in a deep bluish-grey sky was produced by touching the spot with a wire dipped into the ammonia bottle.

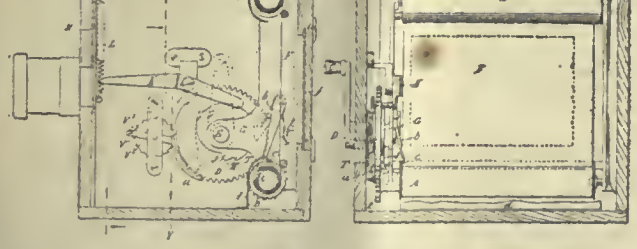
A favourite method of the Major's is to colour the cover instead of the slide itself. The slide is supported on a suitable easel, film side off, and a gelatine-coated cover laid on it, gelatine side out. A few drops of water may be placed between to produce optical contact. The cover is then treated just as if it were the slide, and when turned face to face the register is, of course, perfect.

Major Coughlin gets his gelatine-coated covers by soaking ordinary slide plates in a solution of hypo, but, of course, the economical amateur will make them much cheaper and equally good by coating ordinary thin glass with a filtered solution of gelatine.

FRIESE GREENE'S IMPROVEMENTS IN CAMERAS AND LANTERNS FOR ANIMATED PHOTOGRAPHS.

Mr. Friese Greene's invention relates to photographic cameras of the kind in which a series or number of photographs or pictures are produced successively upon a continuous film or strip made to travel intermittently in the camera. The invention is also applicable to magic lanterns of the kind in which a continuous slide, in the form of a strip or band of photographic or other transparencies, is employed for the purpose of producing panoramic, dissolving, or changing views, or for throwing a number of views in succession upon a screen.

The object of the invention is to simplify the means by which the film or strip is intermittently moved, and, in the case of cameras, to effect, as required, either a continuous or an instantaneous exposure whilst the film



is stationary. Means are also provided for indicating the number of films or sections of films used, and for finding or selecting the view.

The patentee says: "I will describe my invention as applied to a camera :—

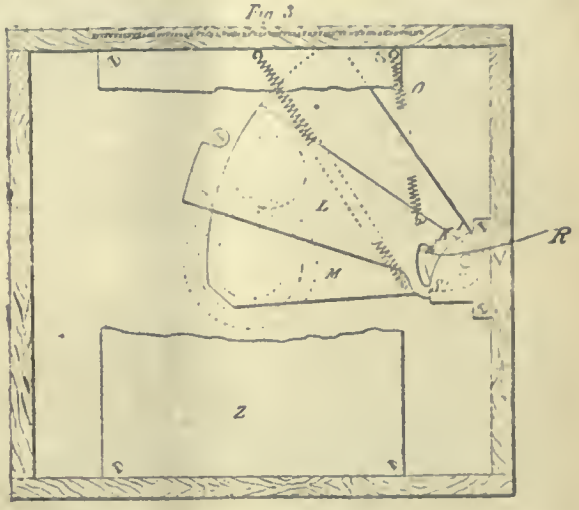
"Fig. 1 is a side elevation of the camera with the box or case in section.

"Fig. 2 is a section on the line, x—y, of fig. 1.

"Fig. 3 is a view of the shutter device, looking towards the lens with the plate, z, partially broken away.

"The camera may be fitted in the ordinary way with two rollers

Fig 3



carrying the film; its application to magic lanterns of the kind referred to will be understood without further explanation. The wind up roller, A, is fitted as usual with a toothed wheel, B, which is rotated by a handle, C, through the intermediation of another toothed wheel, D, mounted on the spindle, E. This last-mentioned toothed wheel, D, has the teeth for a certain portion of its periphery cut away, so that, during a certain part of the revolution of the handle, C, the film, F, is not moved. During this stationary period of the film, the exposure is effected by means of a cam or other arrangement, worked preferably off the handle spindle. This may be effected as follows :—

"On the handle spindle, E, I arrange a cam, O, having two steps, H J, which by a suitable lever or levers operate the shutter. I so arrange the cam which is to operate the shutter, that, by stopping the handle at a certain point, the shutter can be used as a time shutter; whereas, if the handle is continuously rotated, the shutter acts instantaneously.

"I prefer to use a double-shutter arrangement to give the necessary exposure. When one cam and one lever are used, I arrange them as follows:—The lever, K, is operated by the cam, O, and moves the two shutters, L M, which are so arranged that the inner shutter, L, covers the aperture, N, in the outer shutter, M. The two shutters travel together, and there is no exposure as they thus travel. Springs, O P, are attached to the shutters, L M, respectively, so that, when the lever, K, is released by the cam, O, the shutters are drawn quickly across the lens. A pin, K^1, on the end of the lever, K, is released from a notch, R, in the inner shutter, L, at a certain point by means of the projection, S, fixed to the side of the camera, and this shutter then flies back by forces of the spring, O, to its normal position. On the cam, O, being further rotated the lever, K, is released from the cam step, H, and comes upon the cam step, J, which is so adjusted that the aperture of the outer shutter, M, is brought exactly opposite the lens, and will remain in this position until the cam be further rotated. When the cam is further rotated, the lever is released from the cam step, J, and the spring acts on the shutter, M, and the exposure ceases.

"In lieu of the springs, the shutters can be worked by gravity.

"In order to indicate the number of films used, I place another cam, T, on the spindle, E, of the handle, C; this cam works a small dial by means of a suitable lever, V, pawl, V^1, and ratchet, V^2.

"In order to indicate the sections of films used so as to tell where to cut the film, I place a projection, *a*, on the toothed wheel, D. At a certain point of its revolution the projection, *a*, comes into contact with a lever, *b*, which, by means of the pin, *c*, makes a notch or prick on the film, F, thus indicating exactly which part of the film has been exposed. It is desirable that the film on the wind-up and wind-off rollers be protected by shields, *d d*.

"To adjust the focus or to select the view, I insert preferably in the top of the camera, in an aperture made for the purpose, a piece of ruby glass, *e*, so that it is possible to see the image on the film itself. This glass can be suitably protected by a metal or other cover to prevent its being damaged. I also provide at the back another piece of ruby glass, *f*, so as to facilitate the inspection of the image. In using this part of my invention, a piece of red glass or non-actinic film must be inserted in the front or back of the lens. By these means I am enabled to see the photograph on the film itself, thereby ensuring great accuracy.

"In order to use the camera above described as a magic lantern, the glass, *f*, should be removed, and a suitable light applied to the aperture."

The claims are :—

1. In photographic cameras and magic lanterns a toothed wheel in

combination with a wind-off roller, such toothed wheel having the teeth for a certain portion of the periphery cut away, whereby intermittent feed motion is imparted to the film by the continuous motion of a rotary spindle.

2. In photographic cameras the combination of a double stepped cam and a lever for operating the shutter, so that the shutter may act either as a time shutter or an instantaneous shutter at the will of the operator.

3. In photographic cameras the combination and arrangement on the same spindle of means for imparting an intermittent motion to the film of means for indicating the number of the film and means for indicating the parts of the film which have been exposed.

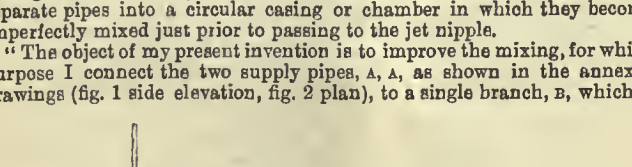
4. In photographic cameras, means substantially as described whereby the image can be focussed on the film itself.

5. The combination and arrangement of parts whereby the same rotating spindle imparts an intermittent motion to the film, operates the shutter either as a time shutter or an instaneous shutter, and operates devices for indicating the number of the film.

GWYER'S IMPROVED MEANS FOR THOROUGHLY MIXING GASES FOR LIME LIGHT.

Mr. George Wright Gwyer says: "According to the usual method of producing a mixture of oxygen and oxy-ether gas, the gases are forced through separate pipes into a circular casing or chamber in which they become imperfectly mixed just prior to passing to the jet nipple.

"The object of my present invention is to improve the mixing, for which purpose I connect the two supply pipes, A, A, as shown in the annexed drawings (fig. 1 side elevation, fig. 2 plan), to a single branch, B, which is





attached to a mixing chamber or vessel, C, of long rectangular, circular, or equivalent shape, and preferably coned at the juncture, from the opposite end of which vessel, C, a curved pipe, D, projects, with a nipple end in line with the lens.

"By this invention the gases from the two pipes, A, A, strike each other at the junction of the branch, and flow along the branch in a partially mixed condition, and then become thoroughly and completely mixed in the chamber or vessel, C, before passing through the curved pipe, D.

"The introduction of ether saturators has rendered necessary an improvement in the mixing of the ether gas with the oxygen. The specific gravity of the gas being more than the hydrogen formerly used, more thorough mixing is required to get good results. This is usually accomplished by increasing the size of the existing circular-shaped mixing chamber. There is, however, a limit to the size of the mixing chamber, because the nipple must not be above the middle of the lenses of the condenser.

"By placing the jet horizontally, it enables a great length of mixing chamber to be obtained.

"Instead of carrying oxygen and oxy-ether gas in separate pipes to the mixing chamber as formerly, the gases commingle as soon as they enter the branch before they come to the mixing chamber, and a cock, E, can be placed that both the oxygen and the oxy-ether gas, or either of them, can be cut off at once, or regulated, an important feature to a lanternist when he sees that the ether in his saturator is getting exhausted."

The claim is for connecting two supply pipes, A A, of a saturator of the kind described and shown to a single pipe, B, in which a partial mixing of the gases can take place prior to passing into the mixing chamber, C, for the more complete saturation, admixture, commingling in proportional quantities, for improving the action on the lime at the point of combustion.

THE AMERICAN LANTERN-SLIDE EXCHANGE.

The following notes on the operations of the American Lantern-Slide Exchange, for which we are indebted to a Transatlantic contemporary, form an interesting record of work done. It may be pointed out that such a scheme is one well within the capacity for British Photographic societies to undertake:—

"During the month of September the interchange of lantern slides among the several clubs and societies was resumed, and the season of 1896–97 begun.

"The season of 1895–96 may be said to have produced a very fair average of work, and to have been rich in collections of foreign slides, there being no less than five sets of these in circulation, giving amateurs and slide-makers a very good opportunity to observe how far ahead or behind the work of Americans is as compared with that of our foreign friends. The stimulating and elevating effect of examples of fine work, thus brought to the attention of American slide-makers, has been the means of raising their standard, both as regards the artistic and technical qualities. In the present season it is doubtful whether the foreign sets will be as numerous as heretofore. Of those on hand the slides of the Photographic Society of the North of France, at Douai, exhibit to the poorest advantage, the subjects being of ordinary interest, and the technical work not up to the average American quality. Of the clubs in the Interchange doing any special work, we are informed that the Buffalo Camera Club is engaged in preparing a new series of views, illustrating modern Niagara, to be accompanied by a consecutive brief description of the pictures, which promises to be interesting. The best slide-makers of the Club are at work in getting up the slides, and the members are enthusiastic over the idea. The Camera Club, of this city, we are advised, contemplates getting together a unique set of slides, which are to be arranged with suitable descriptive notes with reference to consecutive exhibition.

"Two sets of American slides are now in Japan, one of which illustrates the 1893 Chicago World's Fair, and it is expected the Photographic Society of Japan will forward for exhibition in the United States another set of their beautifully coloured work as a return compliment. The sets of English slides, now in circulation among the clubs of the Interchange, are of excellent quality. A new set from the London Lantern Society is promised for the coming season. There is also a prospect of additional new clubs entering the Interchange, especially from Canada, and some domestic clubs who have ceased for a time to contribute slides will begin anew. During the past year the St. Louis Camera Club gave up its membership, but was succeeded by the St. Louis Photographic Society, all of its best slide-workers joining that organization. Among the new clubs admitted was the New Britain Camera Club, of New Britain, Conn. The following are the active clubs at present in the Interchange: The Camera Club, New York, Photographic Society of Philadelphia, Newark Camera Club, Orange Camera Club, Frankford Camera Club, Bethlehem Photographic Society, Schuylkill Camera Club, Photographic Club of Baltimore City, St. Louis Photographic Society, Omaha Camera Club, California Camera Club, Oregon Camera Club, Portland, Oregon, Minneapolis Camera Club, Rockford (Ill.) Camera Club, Chicago Society of Amateur Photographers, Buffalo Camera Club, Toronto Camera Club, Syracuse Camera Club, Albany Camera Club, Portland (Me.) Camera Club, New Britain Camera Club.

"There are nine sets of domestic slides in circulation, from which, in October, 1896, a selection of 100 of the choicest slides will be made, to form a special set for circulation among the societies and clubs in England. In addition to the foregoing is the *American Amateur Photographer* revised prize set of slides, and five sets of foreign slides. During the month of September each club should elect a lantern-slide director, to represent it in the Interchange for the year beginning on November 15 next. In October the newly elected directors elect, by mail vote, a board of five managers, who meet November 15 to select from the numerous sets of slides only those of meritorious quality. The general plan of the working of the Interchange is for each club to set dates for exhibitions, and for the general manager to arrange for the shipment of sets of slides to them a week or ten days before wanted. Then, after exhibition, the slides are shipped to the next club on the list, until every set (about one or two per month) has been the rounds of the route. New clubs wishing to participate in the Interchange should address the General Manager, F. C. Beach, 361, Broadway, New York, for rules and particulars."

ANIMATED PHOTOGRAPHS: A NOTABLE EXHIBITION.

Thanks to the enterprise of the Council of the Liverpool Amateur Photographic Association, the members and their friends had an opportunity, on October 29, of hearing Mr. Birt Acres, of London, one of the leading pioneers of the latest departure in instantaneous photography, and of seeing some of his latest achievements. So great was the demand for tickets, although issued only to members of the Association, that it was necessary to engage the smaller St. George's Hall, and even this was barely large enough.

The chair was occupied by the President, (Mr. J. Sirrett Brown),

and he was supported by the Secretary and most of the other officers of the Association.

Mr. Acres, in the course of his introductory remarks, paid a handsome tribute to other workers who had contributed to the gradual development of the moving photographic picture from the root idea furnished by the zoetrope of a generation ago. The first of these, Mr. Friese Greene, never quite surmounted the initial difficulties, but Mr. Muybridge did, with the excellent results which are so well known. It was not, however, until the plan of a range of cameras, each taking one picture, was abandoned in favour of one camera with a succession of exposures, that further progress was made. The pictures shown on the sheet were each the result of from 800 to 2000 distinct pictures taken on rolls of sensitised film at the rate of fifty or sixty per second. Among these were some admirable examples of well-selected subjects, including scenes at the marriage of the Princess Maud, the visit of the Prince of Wales to Cardiff, the Prince's Derby, Henley Regatta, railway trains in motion, fishing boats leaving the harbour, human boxers, the boxing kangaroo, Lancers exercising on horseback, children playing, merry-go-rounds at a fair, the German Emperor at a review, and waves breaking on the shore at Dover. The exhibition of these fascinating selections from real life was received with continual applause, and at the close of the proceedings a vote of thanks, felicitously proposed by the President, seconded by Mr. E. Rimbault Dibdin, was carried by acclamation in the heartiest manner.

Speaking after a dinner at which he was entertained earlier in the evening by the Council of the Photographic Association, Mr. Birt Acres made the interesting announcement that he has now practically brought to completion improved mechanism by which perfect steadiness is secured in the exhibition of his series of pictures, a result hitherto found unattainable, and the conquest of which will be of the greatest value.

LEEDS PHOTOGRAPHIC SOCIETY.

At the bi-monthly meeting of the Leeds Photographic Society, held in the Society's rooms, Mechanics' Institute, Mr. S. A. Warburton gave a demonstration in lantern manipulation. In his opening remarks, he stated that, at the request of the Hon. Secretary, he intended preparing a short paper for the benefit of "beginners" in the art of lantern projection, but had been carried by his subject further than originally suggested. Producing three lanterns and two screens, he commenced with an Exhibition (by means of diagrams) of the construction and use of the lenses in the modern optical lantern. He then proceeded to show the various effects produced by the following illuminants, viz., paraffin oil, oxyhydrogen light, using various forms of burners, and finally applied the new gas, acetylene, as an experiment. In the latter he was very ably assisted by Mr. G. H. Rodwell, an ardent co-worker in this direction. During the course of the evening ninety-nine slides, kindly forwarded by Mr. J. T. Sandell, of South Norwood, were exhibited and treated by means of the various illuminants. Many of the transparencies were of especial interest, both as regards subject, and as specimens of photographic production, the most noticeable being *Interior of Milan Cathedral; The Choir, St. George's Chapel, Windsor; North Transept, Westminster Abbey; Sacrarium, Westminster; Still Room, Apothecaries' Hall; Entrance Hall, Ironmongers' Company;* also the Hall Marking-room, Drawing-room, and Staircase of the Goldsmiths' Company. Two specimens of memorial windows (the Caxton and Cranmer) in the Stationers' Hall were remarkable for their perfect freedom from halation. It need scarcely be added that the paper was an interesting one; in fact, Mr. Warburton so thoroughly engaged the attention of his audience that "closing" time came as a surprise, and the meeting dissolved with a brief but very hearty vote of thanks. Messrs Walter Beilby and Joseph Horner were elected members of the Society.

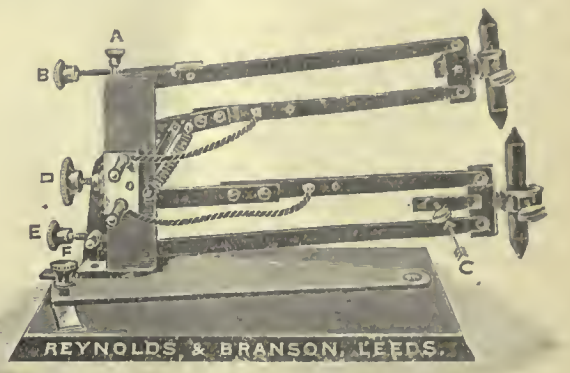
MANCHESTER PHOTOGRAPHIC SOCIETY.

The first Lantern Meeting of the season was held on October 28, at the new rooms of the Society, 44, Mosley-street. The evening was devoted to an exhibition of slides by the members, sent in for selection, to be shown at the Royal Photographic Society on November 7. Close upon 300 slides, made by the principal lantern-slide making members, were shown upon the screen, and the standard of excellence was very high. Mr. T. M. Brook showed his charming series of figure studies, also several landscapes; Mr. F. W. Burton, architecture and hand-camera shots; Mr. A. E. Casson's toned-cloud effects were very effective; Mr. W. G. Coote, bits of Cheshire scenery and rocks and breaking waves at Douglas; Mr. S. L. Coulthurst kept up to his usual standard with landscapes; Mr. Abel Heywood, scenes in Norway; Mr. Harry Wade, views from the Lake District, Shakespeare's country, Cheshire by-ways, and *genre* studies; Mr. W. B. Wood showed the possibilities of pictorial photography round about Urmston; and Mr. J. Whittaker had a series of flower studies. The descriptions were read by Mr. Harry Wade, and Mr. J. Whittaker manipulated the lantern.

REYNOLDS & BRANSON'S ARC LAMP FOR THE OPTICAL LANTERN.

Reynolds & Branson, Leeds.

This Arc Lamp, which we hope to have an early opportunity of trying, has all the usual movements, but differs from others of its kind in that it possesses a parallel feed, the carbons thus travelling in a straight line. In use, one carbon is set slightly in advance, so that the arc is thus arranged to give a maximum illumination in the direction of the condenser. We are informed that with a continuance current of fifty volts



very satisfactory results are obtained. Expert tests have also been applied to the lamp with satisfactory results. Messrs. Ross have the London agency of the lamp.

The Reynolds & Branson Arc Lamp is extremely well made and compact. The adjustments, lateral and vertical, work very smoothly, and have evidently been arrived at from great practical knowledge of what is required in a lamp of this description.

BEST'S IMPROVEMENTS RELATING TO GAS LAMPS FOR PHOTOGRAPHIC AND OTHER PURPOSES.

Mr. R. H. Best's invention consists of improvements relating to gas lamps for photographic and other purposes, his object being to arrange a cluster or combination of lamps within a reflector in such a manner that an intense light can be readily directed upon the required object.

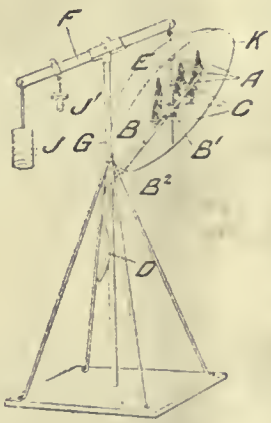


FIG. 1

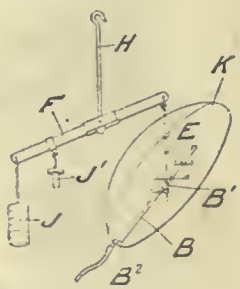


FIG. 2

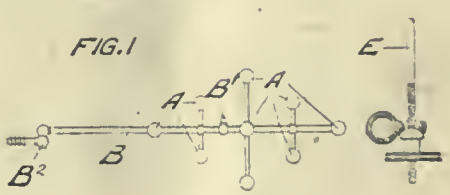


FIG. 3 FIG. 4

"Fig. 1 is a general view of my improved illuminating apparatus mounted upon a stand, and fig. 2 a similar view of the apparatus as arranged for suspension from a ceiling or other over-head support.

"Fig. 3 is a plan to a larger scale, showing the disposition of the burners, and fig. 4 a sectional view of the central joint of the tubular frame.

"The same reference letters in the different views indicate the same parts.

"In carrying my invention into effect, I attach a number of incandescent or other suitable gas lamps or burners such as A to a tubular framing consisting of one common base or delivery pipe, B, having connecting branches, C. To the end of the base or delivery pipe, B, is attached a flexible supply pipe, D, conveying the coal, acetylene, or other gas, to the burners.

"The base or delivery pipe, B, has a joint, B^1, at or about its centre, and a joint, B^2, at the supply-pipe end, the joint, B^1, permitting of movement in a horizontal plane and the joint, B^2, of movement in a vertical direction. The complete tubular framing is suspended by means of a rod, E, from a balanced crank arm or lever, F, such as described in my Specification No. 6907 of 1893, on which letters patent have been granted to me, which is mounted upon a stand such as, G, fig. 1, or is itself suspended by a rod, H, from the ceiling or other over-head support. The burner framing can be readily moved up or down the rod, E, and secured at an any desired position by a screw, nut, or other suitable means.

"The weight of the burners and frame suspended by the rod, E, is balanced by the fixed weight, J, and the smaller and moveable weight, J^1, which is so set that the lever will be in exact balance in any position to which it may be adjusted by raising or lowering the complete framing together with the enclosed reflector, K.

"The reflector, K, is attached to one end of the base or delivery pipe, B, as illustrated, and is held in position on the rod, E, by an adjustable collar or bearing permitting of its being turned in a horizontal plane. The reflector is of such dimensions, and is so arranged, as to cover the cluster of burners as illustrated. I preferably construct the reflector from a thin metallic plate or plates pressed or formed to a semispherical shape, and upon the inner surface I rivet or otherwise attach asbestos or other suitable sheeting painted white.

"The cluster or combination of burners, A, are so disposed in rows or files upon the base or delivery pipe, B, that the row or file of the greatest number of burners coincides approximately with the centre of the reflector when placed in position. The rows or files on each side of the central file contain a gradually diminishing number of burners to coincide with the diminishing space between the opposite sides of the reflector. I place one or any required number of burners in the reflector according to the intensity of light that is necessary.

"By thus arranging the lamps within a reflecting shade I am enabled to readily direct a powerful light on to the required object without loss from diffusion of the rays or other like causes."

The claims are for:—

1. The improved illuminating apparatus for photographical and other purposes consisting in the arrangement of gas burners such as A within an enclosing reflector such as K.

2. In illuminating apparatus the combination of a cluster of gas burners such as A, mounted upon the branches, C, of the base or delivery pipe, B, having the enclosing reflector, K, attached thereto, with a suspension rod, E, and balanced lever, F, mounted upon a stand, G, or suspended from the ceiling or other support by the rod, H.

3. The improved general construction and arrangement of an illuminating apparatus for photographical and other purposes.

LANTERN SLIDES MADE TO ORDER.

This article proposes to treat of lantern slides made from designs, engravings, prints, photographs &c. We will suppose, says the *Philadelphia Exhibitor*, that an engraving is received with order to make one lantern slide, no more definite directions; the engraving is six inches long by three inches wide; it is placed in front of the camera and a negative made by the usual process, from this negative, placed in like manner, a positive is made, now the lantern slide will be three inches long by one and a half inches high; it is made according to order and is sent to the customer. It is returned with the complaint that it is not of the standard size or shape; you answer that it cannot be made so unless both or one end of the engraving is cut off so as to make it as long as it is wide; the answer is, that the slide must contain the entire picture, you have done the best possible, the lantern slide will always be of the same shape and in the same proportion as the original.

If the design permits of a sky effect, then the picture can be dropped to the bottom and the sky carried up until the slide is of the standard shape. When there is both sky and water, and the slide is to be coloured, it may happen that the water line can be carried downward as well as the sky line upward, thus to balance the picture, and obtain the full-size opening; but, if it is to be a plain slide, this cannot be done, as the lower line will show across the slide; by colouring, this line may be hidden.

When the slide is to be coloured, directions should be given in regard to the grade of slide wanted.

Of course, there are all qualities of paintings; these depend on the ability of the artists, irrespective of the method by which the slides are made. There are two grades of coloured slides. The best grade is made by the sealed process; this process increases the transparency, adds to the durability, and tends to improve the sharpness of detail. This sealed slide is a water colour-slide over which Canada balsam is flowed, it must be made on plate glass so that the surface of the picture glass and covering glass will press closely together and not permit any air bubbles to work their way into the film of balsam. The other grade of coloured slide is not sealed, the colours are varnish colours; the glass need not be plate.

It is obvious that the sealed slide, by reason of the balsam, cannot have any mat, and that the slide glass and its covering should be held together until the balsam hardens; this, requiring an indefinitely long time, caused the makers of these slides to place them in wooden frames, that and the wire rings secured the glasses, the openings in these frames are round or square; tin frames round or square, as may be desired, are also furnished. The object sought by the tin frame is to furnish slides as near the size of plain slides as possible; this is attained except in thickness. Coloured slides vary in price according to their shape; if the picture is three inches in diameter, it costs less than one that is three inches square, because, being hand-painted there is less surface to paint, and this takes less time.

A square slide is more difficult to seal and also more difficult to mount in the wooden frames; for these reasons an extra twenty-five cents is charged for stock slides. Parties ordering from designs, &c., should state whether the slide is to be round or square.

In many cases a circle will include all of the subject that may be necessary; this can be determined by holding a ring over the design, then look through the ring and see that it includes what is needed; a convenient ring can be made by the thumb and fore finger, the hand is moved towards and from the design until the top and bottom lines of the design coincide with the thumb and finger, and then the portion of the picture circumscribed will be shown.

WARM TONED LANTERN SLIDES.—For bromide plates for a peculiar warm purple colour there is nothing to beat the plain washing-soda developer, composed of washing soda, 2 ounces; ammonium bromide, 20 grains; and water, 16 ounces, to every ounce of which just before use add 1 grain of dry pyro. For those who, objecting to pyro and its stain, prefer hydroquinone and yet want warm tones, we can advise the use of hydroquinone, 2 grains; ammonium carbonate, 24 grains; ammonium bromide, ½ grain; and distilled water, 1 ounce.—*Photographic Record.*

MR. HALL-EDWARDS'S fresh achievements with the Röntgen rays continue to surpass their predecessors. His most recent triumph has been the discovery by their means the location of a sovereign which was swallowed some two months ago by a boy living in the neighbourhood of Villa Cross. When the lad first swallowed the coin, it did not appear to incommode him much; but, later on, the foreign body caused inflammation and swelling, rendering breathing difficult. The efforts of Dr. Shillito to give relief by medical means proving unavailing, it was deemed advisable to resort to an operation. Before, however, an operation could be undertaken with a reasonable prospect of success, it was necessary to locate the swallowed sovereign, and for this purpose recourse was had to the skill of Mr. Hall-Edwards with the X rays. The impossibility of keeping the boy still preventing a photograph being taken of his gullet, Mr. Hall-Edwards brought into application a new fluorescent screen he had obtained, and an exceptionally fine Crookes' tube by Casson, of London, and on this screen the position of the coin was defined. We understand, however, that, in order to assist the operation, a Röntgen-ray photograph will be taken, so that the surgeon may have the object before him at his work. These fluorescent screens are most interesting. An *Argus* man called on Mr. Hall-Edwards yesterday, and was shown, clearly displayed on the fluorescent screen, the skeleton of his own hand and fore arm, those of Mr. Hall-Edwards, also the skeleton of his foot through the boot, with all the rivets in the sole sharply displayed, the shin bone and knee joint, and the operator's watch and metal buttons through his body. In about six months this amazing discovery has given us almost a surfeit of wonders.—*Birmingham Argus.* Since the above was written, a most successful radiograph has been taken, the child being placed under chloroform. The gullet was then opened, and the coin removed. The photograph shows quite plainly the position of the coin.

MR. T. T. WING, of Chatteris, Cambs, send us his catalogue of chromolitho slides, lanterns, &c., also his lists of new sets, some of which are of recent and very great interest.

FROM Mr. W. Hume, Lothian-street, Edinburgh, we have received his interim list of his well-known cantilever enlarging apparatus. This excellent lantern is made in many patterns, and, being a practical instrument, its popularity need not be wondered at.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*December* 4, 1896.

THE LANTERN RECORD.

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LANTERN MEMS.

The electric supply companies are seriously considering increasing the voltage of their currents where the "direct" currents are supplied, from 100 volts or thereabouts to 220 volts; in fact, some of the provincial corporations, and at least one London company, have already adopted this higher standard. The reason is that, as far as they are concerned, it is more economical, for with about the same amount of electricity double the number of incandescent electric lamps can be supplied. In order that the new voltage may be acceptable, the provincial supply offer, so I have heard, to replace any lamps now in use for others suitable for the higher voltage free of charge.

* * * * *

This is all very well for the incandescent form of lamp, but the arc-lamp users are handicapped somewhat, for there is a waste of power and the cost of the higher resistance which has to be employed. As regards the former, it need not be considered by those who use the arc lamp for optical projection, as the cost of the current for the few hours it is required is fractional; in respect to the resistance it is another matter, and means a much larger resistance or two of the size necessary for a 100-volt current for each arc light. All who have any interest in large halls should endeavour to get the proprietors to fit up a proper main wire and suitable resistance for their particular supply of electricity, so that the expense does not fall on the lanternist using the current at the hall. If this were done, the electric light would become more and more popular for projection purposes, as it has become in theatres and places of entertainment.

* * * * *

As it is now, every month sees additions to the ranks of those who use electricity in their lanterns, for not only is the light so convenient, brilliant, and clear, but it gives such splendid definition, even with objectives or front lenses of average quality. There are still a few things to be done by apparatus-makers or lanternists to get the very best results for dissolving-view apparatus; but, in the pros and cons, the preponderance of benefit is on the side of the arc light, as it confers on the user very great advantages, while the difficulties (they can hardly be called serious drawbacks) will sooner or later be surmounted.

* * * * *

One of these difficulties is dissolving, as we understand it, with limelight work, using gas dissolving taps, that is, the gradual dying away of the picture equally all over the disc, the switching on and off of the current not being quite all that can be desired for this purpose. The dying away of one picture can be well managed by gradually lengthening the arc of light until it ceases to illuminate; but the bringing on of the light has to be sudden, as the "striking" of the arc, as it is called, is a necessity, and therefore mechanical obscuration of the light has to be resorted to. The sharp definition of the arc light produces a curious effect on the screen if fans, iris diaphragms, or graduated shutters, are used in front of the objective.

* * * * *

Rolling curtain shutters between the condenser and the slide can be effectively used, or two Davenport carriers will give a pleasing effect, while solid flap shutters, worked together in a suitable manner, as nearly as possible approach the ideal dissolving of the lime light. A mechanical arrangement has to be attached to the front to save the operator the trouble of moving two shutters at once, and so engaging both his hands, and also to ensure the proper rate of travelling, to gradually expose one slide and shut out the other.

* * * * *

Since writing last month about cinematograph films, I have had submitted to me some excellent samples of large-size films having an area nearly double that of the regular size, which is the same as the visual kinetoscope. However, the apparatus to show these is naturally more expensive than the smaller size, and as I have, from personal knowledge and reports from those using the portable cinematograph sold at 36*l.*, every reason to say a good word for them. This being so private or professional lanternists who wish to add a novelty to their entertainments need not hesitate to invest at once, for by its means funds can be raised for charitable purposes, or to expend the amount necessary to purchase a machine for taking one's own animated photographs when the fine weather comes again in the spring.

* * * * *

What lovely transparencies some of the French lantern slides are, a new series of Pompeii being real gems in their way, while, for sunlight and shadow effect, a set of thirty-six views of Venice would be difficult to beat. These photographs, produced by the albumen process, give transparency in the darkest shadows, and for a certain class of work such as these subjects embrace, and for scenery with mountains and water, it is, in my opinion, the best method of production, also for copying prints, &c. For amateurs it may be too troublesome, and I understand, from the large producers of slides commercially, it would be difficult, with all their arrangements made as they are, to substitute this method for collodion; but I should certainly like, in the interest of the "home-grown industry," so to speak, to see it more used in England for slides to be sold by the trade. One house, I think, uses it for their special copyright slides, and are reaping the reward of their discernment in this matter.

* * * * *

There are several really clever mechanical slides for single lanterns introduced this season, which, by levers and springs, make excellent effects on the screen, and yet are simple to operate

Among them may be mentioned *Blondin Crossing Niagara;* the feet of the tight-rope walker moving, and the wheel of wheelbarrow revolving. Another is *Past and Present*, with cyclists and the inevitable Motor carriage passing along the road; also a good one of the Tower Bridge by day with mechanical movements to open bascules, the view to change to night, with cabs, omnibuses, &c., to cross the bridge.

* * * * *

I AM glad to learn that Professor Lewis is to give, as one of the series of the Cantor lectures, one on the acetylene gas light, when, no doubt, he will touch on the best methods of using the light with the minimum of risk. I trust also he will show how this light can be used to most advantage for projection purposes. At present it is about the same as a good oil lamp, in its practical results, although I was recently told it was capable of projecting a twelve-foot picture. When this size picture can be obtained commercially, without danger and without anything in the way of a disagreeable smell, the apparatus should have a good demand, especially in country places or those far removed from rail, and where compressed gas (oxygen and hydrogen) cannot be obtained. G. R. BAKER.

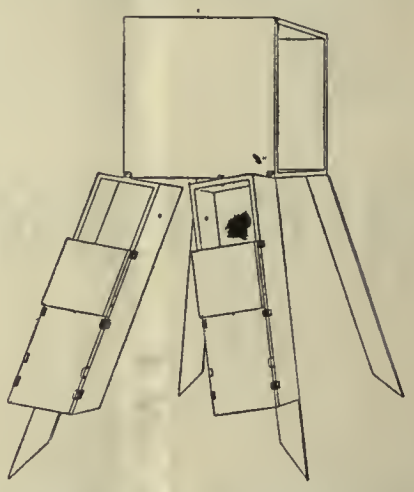
A CONVENIENT LANTERN STAND.

IT has often been said, and wisely, that cylinders containing compressed gases should always be worked in an upright position, so that, if there should be any fluid deposit in the nature of condensation from the gas, there should be no risk of it getting into the passages of the valve or regulator, and interfering with the even flow of the gas to the jet. There is no doubt that under certain conditions there is a deposit on the sides of the cylinder—in the case of the coal gas at all events; for, unlike wine, coal gas does not improve by being kept long in bottles; it deposits one or more of its constituents in a liquid form upon the sides of the containing cylinder, and, if this cylinder is being used in a recumbent attitude, so to speak, the sticky, dirty mess is pretty sure to find its way into the valves and inward parts of the regulator, with the unpleasant and disconcerting effect of untimely "dousing the glim." However, this is not likely to happen if the bottle be kept in an upright position while being used, and if, before commencing a lantern show, the operator turn the cylinder upon its nozzle end, and, having left it to drain for a few minutes, he suddenly opens the valve to blow off the collected liquid, he need have little fear of trouble from this cause.

Here is an idea for a kind of combination lantern stand in which the two heavy cylinders are supported in an upright position and their weight is made use of to give rigidity to the lantern. The advantages of such an arrangement as that shown in the sketch are that the complete apparatus for a limelight lantern show takes up but very little room in the hall, while everything is compact and ready to the lanternist's hand, and great rigidity is secured to the whole structure, at the same time that it is quickly and easily set up or taken to pieces. It packs up into very little space and there are not many separate pieces, which is a great advantage when there is much travelling to be done.

It consists of a strong box in which the lantern ordinarily travels, two light wooden legs to be affixed to the front of the box in any suitable manner, and two long wooden boxes in which the cylinders are placed, and which serve the purpose of the back legs. The question, whether the cylinder boxes will of themselves be sufficiently long to serve this purpose without any extension pieces, will depend entirely upon the size of the cylinders. Forty-foot bottles (long pattern) will be plenty long enough, for the regulators add a certain amount to the length; but, where bottles of less capacity are used, short extension pieces like those shown in the diagram will be necessary, and these may well take the form of sliding legs permanently attached to the back of the cylinder boxes in such a manner that they can be quickly drawn out to the required length, and clamped in that position by means of a screw and wing nut in the manner familiar to users of camera stands.

The method of fastening these hind legs, as it were, to the box whose function it is to support the lantern for the time being, may vary with the different tastes of the divers individuals who may construct the apparatus, and the one which I have adopted is, I think, open to improvement. To the bottom of each cylinder box, at the regulator end, and at that corner which will be outermost when the apparatus is set up for a lantern show, is screwed a hinge, one of whose flaps is drilled and countersunk in the usual way, while the other is provided with a slot, so that it may be quickly slipped behind a set screw and clamped in place without involving the removal of the screw. At the two extreme bottom corners of the back of the lantern box are two bolts fitted with wing nuts for the reception of these hinged flaps, and a similar arrangement at the front of the box provides for the attachment of the front legs. In those cases where the cylinder boxes are too long to be used in this



way, and make a stand of convenient height, boxes, say, for bottles holding fifty or sixty cubic feet of gas, the difficulty may be overcome by putting the bolts for holding the hinged flaps not at the bottom of the lantern box, but somewhere nearer the top, according to the length of the bottles.

The four legs should be prevented from spreading out to more than the required distance by bits of cord stretched between them, after the manner of the household pair of steps. But these cords ought not to be permanently attached, because that would necessitate that all four legs be packed up in one parcel for travelling, which is not desirable, for each of the bottles is quite heavy enough to travel by itself, and should do so without any additional *impedimenta.*

The method which I have adopted for attaching the lids to the boxes containing the bottles may be of interest. As will be seen from the sketch, each lid is fitted with a hinged flap, which folds back to a sufficient extent to allow of the valve of the cylinder being comfortably operated without removing the main portion of the lid. Three iron angle pieces on each side of either box hold the lid in such a manner that it is free to slide back to a certain extent until the cut-away gaps are reached, when the lid may be lifted off altogether. Just on the edge of each flap, where it is hinged to the main portion of the lid, is a screw projecting a little way from the surface of the wood in such a manner as to prevent the lid sliding at all, except when the flap is open, so that the box is closed beyond all chance of becoming accidentally opened, when this flap is shut down and held by the hook with which it is provided. A hole is drilled in the inner side of each box near the top, so that the tubes from the regulators may be passed through, and the boxes closed up if thought desirable. It is desirable occasionally; when the lantern is being operated at a boys' school, for example. CECIL M. HEPWORTH.

ON THE REDUCTION AND INTENSIFICATION OF LANTERN SLIDES.

II.

As an example of the advantages to be derived by having recourse, first to the reduction, and afterwards the strengthening, of the image on a lantern slide, mention may be made of such subjects as are included under the category of black and white.

This may mean intricate and delicate plans, where lines of varying breadths in the original have to be faithfully represented on the screen by means of clean slides, or even such every-day common examples as hymns and printed matter, &c.

In making the negatives from such originals, an experienced worker in collodion will know well the value of iodine as a reducing agent for the removal of any surface deposits that may have been thrown down by development on those parts that it is absolutely necessary should be represented by clear glass. I often think that in the use of iodine lies the great power and value of the collodion process, for an experienced worker can, with its aid, produce such beautifully clean results upon a wet-plate negative or positive with the greatest of ease, and, once having

removed all surface deposits from those parts of the plate that must be clean glass, the building up of the remaining image, or the intensification of the same, as some choose to term the operation, is easily performed by any of the well-known methods.

Many writers, no doubt, when referring to the utility of a gelatine plate for the production of black-and-white results, speak of the same as quite unsuitable for this kind of work, and hence the strong recommendations so often seen to use a collodion process in such cases.

In this respect I often think the value of gelatine is not sufficiently appreciated by those who have mastered the working of collodion.

I know the value of my wet bath as well as any one, and I have derived as much pleasure and benefit from the use of the same as any worker in the kingdom; but, at the same time, I don't decide gelatine in black-and-white working, for I know quite well that, once a worker conscientiously gives his attention to the use of gelatine on such subjects, although it takes a lot to remove the prejudice, he will alter his opinion, and find that equally good results can be obtained with gelatine in many instances as with collodion.

To obtain absolutely opaque blacks and clear glass (by which I mean the film, whether it be that of collodion or gelatine, must be free from any deposit or reduction of silver in such parts) requires the strict observance of certain well-recognised rules of working, no matter whether it be conducted by mean of collodion or gelatine.

With the former of these processes iodine is the sheet anchor, as I have already stated; with gelatine the operations are entirely different, but, when properly understood and executed, quite as clean and brilliant results are obtained as with collodion.

The first necessity is a suitable plate, and I have no hesitation in saying that such as Mawson's lantern or England's photo-mechanical, or any other good slow lantern plate, if used with suitable apparatus, will, at any time, turn out first-rate results.

Every different subject, as lighted, will require its own correct exposure, and if this be carefully attended to, and the plate developed by means of a well-restrained but strong hydroquinone developer, any amount of density in the opacities, without any deterioration of the clear glass portions, can be obtained by means of development alone, for an observant operator, who uses plenty of light—and with these very slow plates the most comfortable light is permissible in a dark room—will know the exact moment that the development should be arrested, so as to preserve the clear glass portions from being veiled over; but even, through failure in this respect, should it be found, on closely examining the plate after being fixed, that some reduction has taken place, it is very easy to remove the same—in fact, quite as easy as would be the case when treating a collodion plate by the application of iodine; and, even should there be no veiling over apparent, almost every production in black-and-white working is improved by the slight application of a suitable clearing or reducing bath.

With many workers, poor, thin images are obtained when they first try gelatine for this kind of work, and hence the opinion so freely expressed that gelatine is not suitable. I firmly believe these thin results are obtained by the use of a developer that is not suitable. Any ordinary formulæ, such as are frequently given out for the development of lantern slides, are far too weak for the production of a bold, vigorous black-and-white subject, no matter whether it be a positive or a negative. Plenty of hydroquinone and bromide should be used in conjunction with a saturated solution of carbonate of soda, by which means a surprisingly strong image is easily developed out, *when the exposure has been carefully timed to dovetail with the developer employed.* By using the carbonate of soda in a saturated condition, the hydroquinone solution is not weakened down to the same extent as when a slush of soda solution is employed, and if the saturated solution of carbonate of soda be added very cautiously in small quantities, and plenty of time given between each addition, the first appearance of the image is easily noticed, and, when seen, it will come along and build itself up in a beautifully vigorous manner, without acting upon those parts where no reduction is required. By this means results are obtained that very probably will require no after-intensification.

As an example of this kind of work, let it be supposed that it is desired to print by reduction through the camera a black-and-white negative, such as would represent some hymn or other black-and-white printed matter.

A good lantern plate is provided and used in conjunction with suitable apparatus, for let it be borne in mind that, when making reductions through the camera, faulty apparatus often yields curious results.

I well remember once having a clever young foreign gentleman as a pupil, who could make excellent slides with the apparatus he possessed from ordinary negatives, but could not get along without producing ghosts, as he termed it, when reducing black-and-white negatives.

I pointed out to him that what he termed ghosts were nothing more nor less than images produced by irregularities in his front diffusing screen. I found out he had been using a sheet of tissue paper, placed about three inches in front of the negative. The clear glass portions of the negatives permitted these spots in the tissue paper being represented in the slide. On adopting a different diffusing screen these ghosts disappeared entirely. Failures of this description are very liable to arise where negatives are used that have absolutely clear glass in some portions, and the greatest care is necessary to use clean screens, as well as placing them in a sufficiently distant position to be out of the focus of the lens, for it must be borne in mind that these clear glass portions yield the opacities in the slide, and, if they are irregular or spotty, the slide is sure to be faulty in such places.

Sometimes, when the sky is evenly overcast, such can be used with advantage, and often make an excellent source to direct the negative to in this kind of work.

Opal glass is to be preferred, where good illumination exists, to coarse examples of ground glass, if these irregularities put in an appearance in lantern-slide making when reducing by means of the camera and copying box. Such are often traceable to faulty screens in advance of the negative.

The plate being exposed and developed fully out by means of such a developer as I have indicated, it is quite possible a slight veiling over of the clear glass portions may be observable when such is fixed and examined with the aid of strong daylight. Should, however, such be present, it is easily got rid of by preparing a weak solution of ferricyanide of potassium, and, after the slide has been slightly washed, immersing the same in it for a few seconds, then taking it out and washing it well in clean cold water. This first application, provided any hypo be left in the film, will certainly have acted upon the veil apparent on the clear glass portions of the slide, and, if it is desired to continue the action further, a few more rapid immersions, all of which should be followed by copious washing, will soon remove the last trace of veiling or degradation of a high light. The use of ferricyanide of potassium with a gelatine plate at this stage almost exactly coincides with the application of iodine to a collodion film previous to intensification; and, in the case of gelatine, if the exposure has dovetailed with the developer, it will be found that plenty of density has been obtained without the necessity of having recourse to intensification. Should such, however, be deemed necessary, a gelatine image is easily strengthened by any of the well-known methods.

To a beginner the application of a solution of mercury to a film reduced or cleared in the manner I have stated must prove a good object lesson. If, on the application of the mercury, the slightest whitening be apparent on the clear glass portions, it is a certain sign that the reduction has not been carried sufficiently far, and errors made in this direction are easily avoided in future. If the plate has been properly cleaned for intensification, there will be no deposit of mercury on parts other than the blacks, and intensification in such cases does no injury.

In the above we have what may be termed an example of plain black-and-white working, which requires nothing in the way of expert or difficult manipulations. Although many look upon the production of an almost absolutely clear glass black-and-white slide as one of the most difficult feats in lantern-slide making, the production of such by the means I have described is simplicity itself, and should afford no trouble if conducted in the manner indicated.

It is not, however, in black-and-white examples only that reduction and intensification plays such an important part; there are other equally great advantages to be derived by such means when it is employed in the case of ordinary subjects.

T. N. Armstrong.

WARM TONES ON LANTERN SLIDES AND TRANSPARENCIES.

[St. Louis and Canadian Photographer.]

The following two methods of changing the tone of lantern slides and transparencies I have never seen published, and, as they are simple and in season, I hope they will prove acceptable. In my experiments I used Seed's lantern-slide plates, developed with their metol-hydroquinone developer, and fixed in a chrome alum hypo bath. After fixing, plates were washed and *dried.*

DARK PURPLE TO BROWN.

Hypo	4 ounce.
Water	32 ounces.

Heat nearly to boiling, and add powdered common alum, one ounce. Should be used cold. If used hot, it will deposit sulphur in the film. Bath works better if it is heated moderately hot several times, and allowed to cool. It should not be filtered, and improves with age. Place the dried slide in the bath until it is toned, which may take a number of hours. The longer it is in the bath, the browner it becomes. The tone is also dependent on the strength of the image. After toning, wash well and dry. The colour seems to be permanent; at least it has withstood the action of the sun for several days.

DARK BROWN TO BRICK RED.

Potassium bichromate	10 grains.
Common alum	150 ,,
Table salt	20 ,,
Water	4 ounces.
Nitric acid, c.p.	10 minims.
Sulphuric acid, c.p.	20 ,,

Bleach the image thoroughly in the above solution. This will take but a few minutes. Rinse well and tone in a strong solution of hydrogen sulphide. For the benefit of the uninitiated I will state that hydrogen sulphide is the compound that gives the eau-de-Cologne odour to aged eggs

and some mineral waters. It is used in all chemical laboratories, and can be very cheaply and easily made. The tone of the slide depends upon the original density of the image. The darker the slide the browner the image. After toning wash and dry. Slides lacking in density can be treated advantageously by this method, as it intensified them. The conversion of the chloride into the sulphide appears to be complete, for no perceptible change could be noticed when tested by placing them in fixing bath.

MILTON B PUNNETT.

LUCIUM.

THE following is the draft complete specification of Prosper Barrière, of Paris, in the Republic of France, for improvements in the preparation and production of bodies for use in what is known as incandescent gas lighting.

Incandescent gas lighting, which consists in suspending fireproof luminous substances within the flame of a Bunsen burner, has been carried out hitherto in several different ways.

The illuminating properties possessed by various metallic oxides, such as those of the zirconium, lanthanum, yttrium, thorium, and magnesium, have suggested the idea of making these oxides serviceable as luminous odies.

The distinctive features of the various metallic oxides hitherto employed have been precisely determined from the points of view of both hysical science and chemistry.

These oxides are derived from corresponding ores, such as thorite, erite, gadolinite, zircons, and the like.

The treatment of these ores is a question which has not as yet been fully cleared up, and I shall not attempt to deal with it, inasmuch as my own efforts have been directed to the study of other minerals.

But the numerous experiments which I have made have enabled me to discover and to satisfy myself of the presence of a novel illuminating body (I will refer to it under the letter A) in a special ore of a sandy nature, obtainable at different places, and known as monazited sand.

This body has properties different from those possessed by the substances used hitherto.

The ore, which possesses a sandy appearance, is really rich river loam, found in small ruby-like pebbles.

The following is an example of an analysis made on a sample of this substance:—

($Si O_2$) Silica	69·7	per cent.
(P_2O_5) Phosphoric acid	6	,,
Fe_2O_3) Iron	1·92	,,
(Al_2O_3) Alumina	15	,,
Cerium, lanthanum, didymium ..... about	2·13	,,
Moisture	2·05	,,
Lime, magnesia, and other miscellaneous matter ..... about	2	,,
A body	1 80	,,

This new body, A, enters into the composition of the ores named in the proportion of from 1·5 to 6 per cent., according to the sample dealt with.

Treatment.

The composition indicated above necessitates special methods of treatment, having for their object to eliminate any harmful substances which the body treated may contain.

The purity of this body is the main condition upon which a satisfactory yield depends.

The ore, on having been porphyrised, is slowly melted in suitable furnaces, with an addition of carbonate of sodium in the proportion of one part of ore for every two parts of carbonate. This operation, which takes about three hours to complete, is intended to convert the oxides into insoluble carbonates.

After cooling, the powdered mass is lixiviated; thus, by means of decantation, the elimination of the silicates and phosphates of sodium is proceeded with

When the carbonates are exhausted by the water, they are subjected to the action of the sulphuric acid, the surplus of which is eliminated by slow calcination; the sulphates are dissolved in cold water and precipitated by means of ammonia. The precipitate, on being washed, is dissolved in hydrochloric acid, care being taken to properly neutralise it.

The greater part of the iron and alumina is then removed by precipitating it by means of oxalic acid.

The insoluble oxalates are converted into sulphates, when partial calcination in a muffle furnace is proceeded with.

The calcination is interrupted at a certain period of the operation, which, however, can only be determined by taking into account the appearance of the material under treatment, the proper time for this being when the greater part of the acid has been eliminated. The sulphates obtained are then pulverised and put in cold water in small quantities, so that the saturation stage is, as nearly as possible, reached.

The solution obtained is then precipitated by means of ammonia, whereby magnesia and the salts of lime are eliminated. Then, by filtering, a gelatinous precipitate of oxides is obtained, which is dissolved in sulphuric acid.

The sulphuric solution obtained, having had sulphate of sodium in solution, saturated while cold, added to it, is used as a precipitating medium, there being crystals in suspension in the mass, and the saturated solutions being allowed to digest for from five to six hours, thus the group, cerium, lanthanum, didymium, is precipitated.

The double sulphates thus obtained are filtered and then thoroughly washed.

In order to remove thorium, the solution is made in sulphuric acid, and the precipitate obtained by means of sulphate of potassium.

Thus all the bodies mentioned above as being present with the A body may be eliminated.

Now the principal operation of the process has to be commenced. It consists in precipitating the solution by means of hyposulphite of sodium in the condition of a concentrated solution. This operation is started with a slight action of heat. When the boiling point is reached, the A body is precipitated first. The body obtained contains as impurities small quantities of ytterite earths, principally ytterbia.

It only remains after this to effect a most thorough washing of the hyposulphite thus obtained, using cold water for the purpose. After the washing, a solution is made in hydrochloric acid.

A reaction with sulphocyanide of ammonium will at that moment show whether there are any traces of iron left, and these, if present, may then be eliminated by the ordinary methods.

In the same way, traces of other metallic substances may be eliminated by means of a current of sulphuretted hydrogen sent into the solution of hydrochloric acid.

After precipitation by means of ammonia, the body is energetically washed with distilled cold water.

By such means a body is obtained which in itself is luminous, and which is made use of in the manner which I will now describe.

Generally speaking, the oxides employed for illuminating purposes, as well as the body to which I have referred just now, produce light which is illuminating and radiating only to a certain degree.

Radiation, which constitutes the illuminating power proper, and more particularly the brilliancy desirable in a luminous body, is obtained owing to the molecular conditions which I have found to be realisable with exceptional ease in a body which, after many trials, I have discovered to be oxide of zinc. Any other body fulfilling the same conditions may, however, be employed without departing from the principle of the inventions.

Oxide of zinc, which, upon being heated at an ordinary temperature, assumes a greenish-yellow hue, when subjected to the heat of a Bunsen burner, becomes phosphorescent as it were. It is sufficient to add a small percentage of it to the illuminating solution.

I employ a nitric solution of the oxide in question.

After a fabric, which should be as fibrous as possible, has been impregnated with the said solution, when the wick thus formed has been incinerated, the decomposition of the nitrates will take place under the most favourable conditions conceivable.

Part of the oxide of zinc, the surplus thereof, is volatilised, while the remainder will be in that molecular condition referred to just now.

It is not impossible to use other oxides, which, if employed under certain conditions, and mixed or combined in a certain definite manner, and either combined or not with the body A, may form novel bodies.

The fabric which I employ is made of special thread or filament, such as the fibres of flax, china grass, or the like, and it should have about ninety meshes per square centimetre. It is washed in a one-tenth solution of hydrochloric acid, and then with water having a slight amount of ammonia incorporated in it.

The fabric, after drying, is cut into strips of, say, twenty centimetres, and strengthened at their upper part with a strip of muslin or tulle.

Impregnation may be advantageously substituted by aspersion, by means of a special injector, which process offers the advantage of not necessitating protracted handling of the fabric, whereby certain impurities might find their way into it.

The bath employed is a nitric aqueous solution, containing as much as ten per cent. of the luminous body. Each wick should absorb at least six cubic centimetres.

After the wick has been placed on a special form of mould, it is secured to a hanger of nickel by means of an asbestos thread.

A Bunsen flame is rapidly and circularly passed round the upper portion of the said wick, while another burner is worked from below. Incineration will then take place, and the earths will form gradually. By such means a skeleton is obtained, which is placed over a burner for about half an hour in order to secure complete calcination; the wick is then in readiness for being supplied in a marketable form, and may be fitted to any burner.

The novel illuminating body which I have referred to as A I have named "Lucium."

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare what I claim is:—

1. For incandescent gas lighting, a new body derived from monazite sands.

2. For incandescent gas lighting, the body A referred to in the preceding claim, in combination with a small percentage of oxide of zinc, or

other body capable of imparting the necessary intensity and power of radiation.

3. The purification of the A body referred to in the first claim by treating monazite sands by oxalic acid, sulphate of sodium, sulphate of potassium, and hyposulphite of sodium.

4. For incandescent gas lighting, the combination of the aforesaid body A (either alone or in combination with other bodies, as indicated in the second claim) with fibres or filaments.

THE LIVING PICTURES—THE SKELETON.

[Written for the ALMANAC, but received too late.]

Such a bustle and a hurry
O'er the "living picture" craze,
Rivals rushing, full of worry
In these advertising days.

Each the first, and each the only
Each the others wildly chaff
All of them proclaiming boldly
There's the first A-kind-o-graph,

But it is a wonder really
How the constant flood of life
O'er the screen keeps moving freely,
Full of action—stir and strife.

There the waves are wildly breaking
There the swimmer stems the tide.
The cyclist his record making,
With countless varied scenes beside.

'Tis far from perfect in its movements,
'Tis very hard upon the eyes;
The jolty wobble no improvements,
Smooth running films a surprise.

Still successful beyond reason,
Spite of all its erring ways,
Holding first place in the season
Is the "Living picture craze."

We pass the out-door show and come
To the "Interior Views" we'd say—
X-ray exposures—held by some
The greatest wonder of the day.

In this the Crookes' tube plays its part,
Producing pictures—gruesome things—
Skeleton hand and beating heart
Bony fingers adorned with rings.

The products are not pleasant; still
They've proved the means of great advance
New powers, before unknown, that will
The scientist's results enhance

The "Cinemato" runs along,
Giving pleasure by its pace,
The X rays' function being strong
To benefit the human race.

Each plays its part in the season,
Each fills a niche of its own.
To place them together's no treason,
For side by side have they grown.

MARK OUTE.

PORTRAITURE BY THE ELECTRIC LIGHT.

AT a recent meeting of the New York Camera Club, Mr. G. G. Rockwood gave a lecture on this subject. The lecturer, whose prompt adoption of new ideas and appliances has been a characteristic of his long photographic career, was peculiarly qualified to speak on the subject of artificial light in the studio, both from his experience with the arc light and his present labours to introduce an incandescent form of gas light for the same purpose. This latter novelty he promised to demonstrate before the Club when perfected. In his introduction he drew attention to the fact that artificial light, though possessing many advantages in convenience, was necessarily inferior to diffused daylight for the purpose of portraiture, Sunlight, consisting of rays virtually parallel, is transmitted in a homogeneous medium, as the atmosphere, through long distances without sensible diminution in intensity; but artificial light, on the contrary, advancing from its source in divergent rays, diminishes according to the square of the distance. It is very essential, therefore, in employing an artificial light in portraiture, even one as powerful and rich in actinic quality as the arc light, to have the object very near the source of light. This is especially the case with the Club's studio, where the electric light is first thrown on a white screen so as to use the softer light diffused by the reflector. Now, this nearness, while it sufficiently illuminates the side toward the light, introduces a new trouble, hardness of shadows, from the great intensity of the light near its source. To remedy this evil, Mr. Rockwood recommends the use of a head screen, generally made in the form of a hoop covered with thin tissue paper or cheese cloth, and mounted on the usual adjustable stand. The greater part of Mr. Rockwood's lecture was a practical exposition of the proper way to utilise the arc light, using the Club's duplex lamp and Secretary Canfield's head and shoulders as a model. He explained what is called a normal lighting, or where the light comes at an angle of forty-five degrees from the front and side of the subject. It was at once evident that the screen, as rearranged in the present disposition of the Club rooms, was too low to give the best modelling; also, in changing the studio from the east to the west side of the hall so as to leave the windows unobstructed, they had made another error, for the wrong side of the face is thereby presented to the light. Mr. Rockwood contended that in nearly all instances the left side of the human face presents the greatest number of characteristic features, and hence should be generally presented to the light in making a portrait. He proved this by various presentations of his own features and those of Mr. Canfield, and also cited cases of well-known public characters who had been his sitters. It was noticed that Mr. Rockwood obtained the desired lighting, and composed his picture by giving his entire attention to the arrangement of the light and the model, and did not once resort to the camera or study the ground glass. One cause of the failure of tyros in picture-making is their anxiety to keep their heads continually under the focussing cloth. This is a poor way to take a portrait, and the sitter is nearly always tired out before a single exposure is made. With these photographers the lens and the wonderful electric light are expected to do the work and supply all the deficiencies in the operator. Mr. Rockwood extemporised a head screen with a sheet of tracing paper, and showed how the shadows were softened and yet lightened by its use. He said that, while the high lights were reduced in intensity, the exposure did not have to be prolonged, the increased illumination of the shadows more than compensating for the loss. It was recommended to so arrange the head screen that, while the shadows on the face are mellowed, a stronger light may be thrown on the draperies around the shoulders and bust. This produces a remarkably brilliant effect. What is termed a slant light, which is now frequently used as a substitute for the old combination of side and top lights, was shown by Mr. Rockwood to be actually an easy and more economical way of obtaining the same results; for, in effect, most photographers, by screening the side light from the bottom and the over-head light from the top, have all along been producing this same slant light, which is now hailed as a novelty in studio construction. Mr. Rockwood kindly answered the numerous questions put to him by the members of the club, and invited all to visit his son's establishment on the Boulevard, which has been fitted out with all the latest studio requirements.

FLASHLIGHT PHOTOGRAPHY.*

[From the Australian Photographic Journal.]

A PHOTOGRAPH illustrating a scene in *The Sleeping Beauty* extravaganza was taken in the largest building in Hobart—the Theatre Royal. So a brief account of the *modus operandi* may not be out of place. The camera was placed and carefully levelled on a strong kitchen table in the centre of the stalls, which, in the above building, occupy the sloping floor from the orchestra back to the level of the dress circle. The lamps (pipes) were erected as far to the left as possible without throwing a shadow from the wings across the stage. As the floor is so much below the level of the latter, a third length of rod was inserted between uprights one and two to raise the lamps above the camera, and to prevent the shadows of the front ranks of performers from falling upon those in the rear. To throw the light forward, my lantern sheet was suspended from the front of the dress circle to act as a reflector. It is well to have an assistant to light and extinguish the lamps, while you occupy the table and blow off the flash, &c.

There is no special difficulty in taking photographs of theatrical scenes, although I believe several attempts had been previously made without success. All preparations may be made, and the camera focussed, without interfering with a "full-dress" rehearsal, any special scene being rearranged at the close of an act. By this means very little delay indeed is occasioned. On one occasion I took four flashlight pictures of scenes in the *Bohemian Girl* without delaying the rehearsal more than ten or twelve minutes altogether. The scenes from the *Sleeping Beauty* were taken at the close of a performance as soon as the audience had left; but this is not advisable if it can be prevented, as the performers are tired and may wish to get home, and it necessitates the extra trouble and delay of rearranging both scenery and the scenes. When the scene to be photographed includes a few characters only, it is better to have both camera and lamps quite close to, or even on, the stage, or to use a lens having a much longer focus.

And now as to the development of the negative. I have read a good deal about "special" developers for flashlight photographs, but there is no need to trouble about any of these. The Ilford pyro-soda developer will bring out all the detail and density one can desire, if used with

* Concluded from page 77.

intelligence and care. Should the subject photographed contain great contrasts, such as white dresses and dark surroundings, use less pyro and dilute with water according to requirements. Develop for detail rather than density, but continue development until the negative looks somewhat dense by transmitted light, or on fixing it will be too thin. There should be no need to force development by using more than a normal quantity of the soda. "Let patience have her perfect work," and you will not be disappointed.

A word of warning with regard to the light used. As the plates are very sensitive, work some distance from the lamp, or keep the flame low until development is nearly completed, and cover the dish, which is all the better if it has a glass bottom and well for the developer to run into when tilted up for examination. Do not be tempted to use an extra ruby glass before the lamp when developing instantaneous plates, as you will be deceived as to the density of the negative, and find it miserably thin after fixing. Use the light you have been accustomed to, hut, if possible, turn it up and down as required.

I have also read a great deal about "doctoring" flashlight negatives, such as reducing density locally or entirely; "bringing a great amount of skill upon the back of the negative" in the form of "raw sienna moistened and rubbed into matt varnish with the finger over the thin portions," to bring out "the detail" in printing; scraping off the varnish over the too dense portions, &c.—in short, "using all the dodges known to retouchers to complete a successful negative for printing." Those, and suchlike, "little details" are far more apt to *discourage* than *encourage* one about to take up flashlight work, as one is apt to imagine that every negative requires an awful amount of such messing to make it at all serviceable. Personally, I can assure my readers that only one of my negatives has really required any "doctoring" whatever; and all that was needed was the scraping away of a portion of the fan and pink vase which ran into the features of the lady at the piano, and which gave no indication to the eye of blending with the face in any way. The intensity of the light did the mischief.

It is, of course, open to any one to expend any amount of skill upon doctoring his negatives if he so desire; but it is not always, nor often, necessary to the production of good pictures. CHARLES GRUNCELL.

STRAY THOUGHTS ON LANTERN-SLIDE MAKING.

IN the course of his remarks upon the above subject, before the Edinburgh Photographic Society recently, Mr. Patrick said that no branch of photographic art was more full of promise of practical utility and pleasure than the making and exhibition of lantern slides. It is the one method above all others which affords the greatest pleasure to the greatest number.

The excellence of the slide will depend, of course, upon the quality, pictorially and technically, of the negative from which it is made, the negative being (so to speak) the backbone of the transparency. A good plucky negative, with a full range of gradation, will be found to give the best results.

Mr. Patrick then pointed out that at the present time there seems to be a tendency to produce thin weak negatives, brought about, no doubt, by the extensive use of gelatino-chloride papers. Such a character of negative was not well adapted for the best transparency work, although a great deal could be done in the way of obtaining passable results from such negatives by skilful manipulation. From a fully exposed negative, for instance, a crisp result can be obtained by under-exposing the transparency slightly; or, from an under-exposed negative, the harsh feeling caused by too strong contrasts can be rectified by fully exposing the transparency, but by doing so you lower the keynote, as it were, of the whole picture.

In order to produce good results in negative-making, the exposure and developer must go hand in hand, and both must be suited to the subject. There is no such thing as one correct developer, or that the constituents of the developer must be mixed in certain fixed proportions for all negatives.

We will sometimes find aid to picture-making in under and over-exposure, and even fog sometimes, in careful hands, will help to create pictures.

By over-exposure and a well-restrained developer, or by the reverse, delicate atmospheric effects or strong contrasts may result at the will of the photographer. He can so render his interpretation of the scene either as a hard, matter-of-fact picture, or suggest in the finished transparency the impression nature conveyed to him; he can, in fact, cause his mind to pass into the finished picture.

One of the essential qualities of a good lantern picture is, undoubtedly, artistic composition. What I mean by artistic composition is the arranging of the subject in such a manner that, as the eye wanders over the picture, it is focussed (so to speak) on the principal object. The object of composition is really to secure unity, to concentrate the eye on a point, and keep all accessories subordinate to that object.

Speaking of the wet and dry-plate processes, Mr. Patrick said: "After all, it is not so much the process as the worker that has a great deal to do with the question. More depends on the man and his method of working than upon the process employed."

The gelatine dry plate as manufactured at the present time is an article of great perfection and capable of yielding the very best results. Of the various brands in the market there is not very much to choose among them, each brand has some special feature which requires a little practice to understand. Take up a certain brand, work at it, get into its little ways, stick to it, and you will be rewarded.

Much has been said and written on the colouring of lantern slides. The daubing of more or less transparent colour on a lantern slide was in Mr. Patrick's opinion an insult to nature. A monochrome slide, if otherwise good, is without doubt the most attractive, and the range of tone at our disposal is quite sufficient (without overstretching one's imagination) to suggest colour values. Another important matter in lantern-slide making is the shape and opening the picture is permitted to have. The shape of the mask of a lantern picture will either make or mar it. The great thing is to suit the mask to the subject, and not the subject to the mask.

OPTICAL ILLUSIONS.

BEFORE the Midland Institute Scientific Society, Newcastle-on-Tyne, Mr. P. L. Gray recently lectured on *Optical Illusions as distinct from Delusions*. They had, he said, some sort of real, outside basis, from which a non-existent appearance was deduced by the observer, either from physiological causes in the eye itself or from errors of judgment due to a variety of causes in translating the actual impression on the retina into a mental impression. Delusions, on the other hand, required no real object to excite them, or, in other words, were entirely subjective. On the whole, he thought that of all senses that of sight was the most, and that of smell the least, easily deceived. This was due to the enormous extent to which the interpretation of the phenomena presented to the eye was dependent upon experience. One did not in ordinary cases actually see what would be seen by a blind man suddenly restored to sight. In the latter case persons had described their impressions as that of all surrounding objects suddenly crowding upon them. If a fly came suddenly between the eye and the page of a book, the first impression was that of a large eagle flying across. Atmospheric absorption also played an important part in one's visual impressions. The fact that the figure of an ordinary man suddenly looming upon one out of a fog appeared like that of a giant was due to one's experience of perspective; the man, being dimly seen, appeared to be at a distance, but without any diminution of his height. Some of the commonest illusions depended on contrasts of geometrical forms. For instance, as the lecturer demonstrated, straight lines in association with curves appeared to be curved, and straight lines might be so associated that those which were parallel appeared to be not parallel, and *vice versâ*. A space broken up by cross lines appeared wider than it actually was. This had an important bearing on such matters as dress. A short person wearing a dress with horizontal stripes would appear stouter; vertical stripes would increase one's apparent height. Other illusions depended upon pseudo-perspective effects. An arrangement of straight lines might be looked at as representing a solid—a truncated pyramid, for instance, with the small end towards one, or a cooking tin with the open side nearest. These two impressions could be alternated by a conscious mental effort. Another linear drawing would become at will a picture of a flight of steps, or of a cornice in which the steps were inverted. A considerable number of illusions owed their origin to irradiation, a luminous body appearing larger than a dark body of the same area. The most familiar example was that of "the old moon in the new moon's arms." A row of spaces illuminated in graduated degrees of brightness, but each in itself of uniform intensity of illumination, appeared to represent a fluted surface, the edge nearest the darker shade appearing lighter than it really was, and the edge of the lighter space correspondingly darker. The voluntary choice of interpretation in the case of a drawing which might represent either a relief or an intaglio gave many curious results. Another class of illusion depended upon the retention of an impression by the retina for a short time after the stimulus had ceased. A stick held between the lantern and a patch of red light appeared to give a green shadow; with green light the shadow was red; with yellow light it was blue or violet; with blue it was orange. Even if perfect colour photography became an actual fact, the untouched photograph would not reproduce the actual visual impression of a scene. In a golden sunset the photograph would show the distant mountains not purple, but probably an inky black, because the photographic plate would not give the same contrast of colours which the eye saw. The work of the artist was to make the best artistic effect out of illusions, whether in form or in colour. The born artist in colours was the man who saw distinctly all colours, such as had been seen in the experiments. The ordinary observer did not see them, because the brain unconsciously corrected the visual impression; the artist saw the colour shadows clearly, and by slightly exaggerating them in his picture recalled the actual contrasts of colour as seen to the eye. Ordinarily one knew that grass was green, and, in spite of the impression on the retina, one declined to admit, what the artist clearly saw, that the shadows had a distinctly reddish tinge. An artist had described how he alone of a party saw the sails of a boat look a vivid green against a red sky. One theory of colour vision was that we were capable of three double sensations of colour—the white-black, the red-green, and the blue-yellow sensations; so that, while one part of the retina was affected by light of a certain colour, the other parts experienced a reaction, resulting in a

sensation made up of complementary colours. The other theory postulated only three simple colour sensations, but the lecturer preferred the former, as accounting better for the colour shadows or "after-images." The "optical top," which on rotation made black lines on white appear to be of colours, varying as they approached the centre and changing their order on the rotation being reversed, was shown with excellent effect. The explanation suggested was that the colour sensations varied in quickness, the red being the nimblest both in beginning and in ceasing. The lecturer, however, as on all other points, cautioned his hearers against accepting any theory as a complete explanation. For the most part, the theory was to be taken either as little better than a restatement of the facts or as a provisional hypothesis.

"PRIMUS" DRAWING-ROOM LANTERN AND SCREEN.

Butcher & Son, Blackheath.

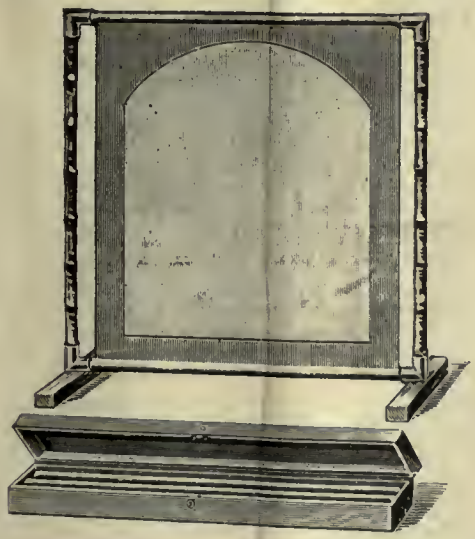
Messrs. W. Butcher & Son, of Blackheath, send us an excellent little catalogue of lanterns, accessories, and slides, which includes references to all their well-known specialities, of which we select two for illustration:—

The "Primus" P-K Lantern is specially constructed for the exhibition



of lantern slides made from negatives taken with the Pocket Kodak Camera and is designed for use, on the table, in the drawing or dining-room.

The second illustration depicts the "Primus" P-K or Drawing-room Table Lantern Screen. It gives a picture three feet square, and stands



on the ordinary dining-room table. The screen is hung on a portable bamboo frame, which takes to pieces in a minute or two, and packs up into a neat box. It is very compact, and the total weight is only 3 lbs.

WRIGHT AND ANDERTON'S IMPROVED SCREEN FOR OPTICAL PROJECTION PURPOSES.

Messrs. Lewis Wright and John Anderton say:—

"Hitherto, metallic-faced screens for optical projection purposes have been made with a plain surface, and, as a result, the superior brightness possessed by them over screens of other kinds has been apparent only within a somewhat limited angle of view; also portable screens used for optical projection that are faced with paper, metallic foil or other material, are liable to buckle and curl at the edges, and by so doing destroy the evenness of the surface.

"By our present invention we overcome these defects in the screens for use with magic or optical lanterns, lantern microscopes, and all other optical projection and reflecting apparatus, and our improved method of arrangement consists, firstly, in applying to calico, linen, canvas, or other suitable material or substance forming the screens, or covering of the same, or to wall surfaces or other situations as required, a facing or surface composed of silver or other metal or metallic sheets, films, or leaves, or powdered bronze, or any other metallic surface, which surface is covered all over with indentations, corrugations, or irregularities of any suitable form or kind, or with fine grooves or striations, arranged perpendicularly or otherwise if desired upon the said surface, for the purpose when in use of causing the rays of light to be scattered laterally, and thus increasing the lateral reflection of the light, and thereby causing the projected image or images to be seen with equal brightness from any point of view within reasonable limits. To remedy the defect of buckling when the screens are faced with paper, metallic foil, or other substance, before referred to, we paste, or otherwise apply, a coating or lining of paper or other suitable material to the back of the screen of sufficient strength or substance to counteract the strain of the front surface, and thus obtain a flat and even hang of the screen.

"By these means much better results are obtained in all cases than by the present arrangements.

"We do not necessarily limit ourselves to the more precise details herein set forth, as we may sometimes deem it expedient to vary the same, without departing from the essential features comprising the principle of our improvements; but the claims are, firstly, an improved screen for optical projection purposes; secondly, in screens composed of any suitable material or substance for use with magic lanterns, lantern microscopes, and all other optical projection and reflecting apparatus we claim the combination with the calico, linen, or canvas covering of said screen, or, upon walls or other situations, of a surface composed of silver or other metal or metallic sheets, of films, leaves, or powdered bronze, or any other suitable surface of metal, and the formation and arrangement in or upon the said metallic surface of a series of fine grooves or striations, arranged perpendicularly or otherwise, or indentations, corrugations, or other irregularities of any kind upon said metallic surface; thirdly, in screens the means for remedying the defects caused by possible liability of the surfaces buckling when faced with paper, metallic foil, or other substance likely to buckle when strained."

PROJECTING APPARATUS FOR SHOWING MOTION ON THE SCREEN.

[Anthony's International Annual.]

It is now about twelve years since Anschütz announced his first Schnellseher, with which he succeeded in a very complete way in uniting a series of views so that the object—for instance, a running horse—could be seen in its natural motions. For the production of his views Anschütz uses as many cameras standing close together as he intends to make views, generally twenty-four. The instantaneous shutters of these cameras are released by electricity within one to two seconds. This arrangement gives, therefore, but a limited time for all the motions to be taken. For motions occupying a minute or so at least one thousand cameras would be required.

The Schnellseher, as known, is so arranged that for the observation of the picture you have to look through a small opening in the body of the apparatus. At first Anschütz did not attempt to project the moving pictures enlarged upon a white screen, as considerable difficulties were connected herewith.

The American, Muybridge, occupied himself likewise with the production of such views, and constructed an apparatus for their projection. He exhibited it at the Urania Club in Berlin, but many defects were apparent.

In 1894, Anschütz took up the idea again, to introduce his pictures by way of projection, and it was reported in 1895 that he had mastered all technical difficulties. The chief drawback was that, on account of the limited number of cameras, the series of pictures was too short. To make a change in this direction was Edison's effort. The introduction of films, which could be had in almost any length, facilitated his endeavours considerably. He constructed an apparatus which, provided with only one objective, has as picture-carrier a roll of film. That sounds very simple, but in reality the difficulties are great. During exposure the film is not permitted to move, because no sharp pictures, even at shortest time of exposure, could thus be obtained. But, as in order to have in the picture uniform motions, uninterrupted by stoppage, *at least* fifteen views per second have to be taken, it can be imagined that the solution is not an easy one. Fifteen times in a second the film has to pass forward and stop again. Edison solved this problem in a magnificent manner. With his apparatus he was enabled to take a long series of pictures. To unite these pictures in the Schnellseher, he printed the negative film upon a second one, which shows as a positive. The latter he fastened in an apparatus (kinetoscope).

Edison's pictures are about 2 cm. wide and 1¾ cm. high; each strip of film carries from 600 to 700 views. These series of pictures represent the motions made within twenty-five to thirty seconds. The pictures are looked at through a lens which enlarges them a little. Edison did not attempt to project his pictures, as an enlargement by projection would show the pictures without sharpness upon the white screen, and only with great difficulty could the succeeding picture be put in the exact position of the preceding one. Anschütz, in 1894, called attention to these difficulties. The very small pictures, as contained in the kinetoscope, hardly show this trembling motion to the eye of the observer, owing to their size.

To offer something new upon this field, efforts had to be made to introduce series of views with a considerable number of pictures in good projection. More than one scientist has worked in this direction during the last years. Lately the efforts of some have indeed not been without partial success, and progress can be seen. At present two instruments have been introduced to the public in Europe. One is the Kinematograph of Lumière, in Lyons, the other the Kinematograph after the French Irola patent. The inner arrangements, I have to remark, are not shown to visitors, but the arrangement of the Lumière apparatus is described in Eder's *Year-Book*, 1896, pp. 391–400. Both apparatuses have an electric incandescent lamp as light source for the projection. In both the pictures are on film rolls. The size of the pictures is about the same as Edison's (1½ to 2 cm.). The size of the projected picture is about 1½ to 2 metres. Regarding the arrangement of Lumière's apparatus, the German patent gives the following description:—

"The film strip is pushed forward by uniform turning of the roll, so that a fork with its prongs catches the holes at the edge of the strip, carrying the latter periodically along, but by a motion in opposite directions liberating the same again. Between objective and film is a window upon a rotating disc, which admits the taking of the picture or the projection of the same."

We would mention here that in December, 1893, a patent was granted on an arrangement corresponding to that of Lumière.

Lumière Bros. say that they make fifteen views in a second, and project the same. That is almost too little to obtain a smooth, not trembling, motion in the projected picture; but, as the motions are smooth, certain authorities are of the opinion that Lumière prints the pictures perhaps twice upon the positive film, so that in the projection apparatus thirty pictures pass the objective in every second. That by such a process the trembling of the pictures can be essentially relieved is demonstrated by practical experience.

Lumière speaks of nine hundred pictures upon one strip in his circulars. A personal test with the second clock has proven that the time for running off a series of pictures deviates between thirty and forty-five seconds. Therefore on one roll would be only from $15 \times 30 = 450$ to $15 \times 45 = 675$ pictures.

Complaint has repeatedly been made that at the exhibitions the handle which sets the roller in motion was turned too quickly, and that the motions appeared too hasty. At all the exhibitions seen by the writer the apparatus worked with normal rapidity, and the motion left a natural impression.

How is it, now, with the solution of the most difficult problem—the exact fitting of the several pictures? We have pointed already to the fact that, if a picture does not fill *exactly* the place of its predecessor, the total picture will move in all directions.

The Lumière Bros. solved this problem in a satisfactory manner. Still even Lumière's apparatus is open yet to improvement. Regarding total effect and rigidity of the pictures, they surpass the Edison kinetoscope that I have seen. To produce his series of pictures, Edison constructed a stage-like place, on which the brilliantly illuminated figures set off from the dark background. This arrangement is wrong. If we have light pictures upon a dark ground in projection, the eye will catch much quicker the interrupted passages from one picture to the other than if the picture was light upon a light ground. Edison's arrangement was therefore discarded, and in preference sunny street scenes, with application of a shady background, were selected.

The trembling of the picture is also observable in the Lumière apparatus, particularly where houses and other immovable objects form the background. We see a fine picture, a fisherman in his boat upon the high seas, the boat passing proudly through the rolling waves, everything faithful to nature; but the house that can be seen at the side moves to and fro as if shaken by an earthquake. Still more painful to look at is the wall of the Exchange at Marseilles, looking as if it was to tumble down every minute.

These defects can never be removed entirely. The producers of series views should therefore be careful in the selection of their objects.

Some of Lumière's pictures are extremely beautiful, for instance, their Aquarium, playing children, &c. The Irola apparatus has no such meritorious properties. The trembling of the pictures is much stronger, and the motions are not so rounded and smooth.

The opinion that the kinematograph will soon take the place of the ordinary projection apparatus we cannot agree with. The above-mentioned very considerable defects, which are tiresome to the eye of the observer, can hardly be removed, but we should not forget that only under great difficulties can such pictures be taken. DR. R. NEUHAUSS.

MR. ALFRED UNDERHILL, of 32, Clarendon-road, West Croydon, Surrey, sends us his supplementary and clearance sale list of optical lanterns, slides, and photographic apparatus, which includes many bargains.

FROM Mr. E. G. Wood, of 74, Cheapside, we have received the fifty-third issue of his catalogue. About 150 pages are devoted to classified lists of slides, and the remainder of the book to lantern apparatus.

NEWTON'S CATALOGUE.—We have received the catalogue of Messrs. Newton & Co., of 3, Fleet-street, E.C., which is devoted to particulars of the firm's many varieties of optical-lantern apparatus, slides, &c. With it is a supplementary list of lantern slides for the season 1896-97, from which we gather that among the new sets are series dealing with *Queen Victoria's Reign; Life of the Duke of Wellington; Egypt and the Nile; Italy; Turkey and Ephesus; Astronomy; Poultry-rearing; Wood-carving.* Most of the sets are made from photographs taken during the present year.

"I WAS THERE!"—A few weeks ago, when Mr. Mathieson, of Invercargill, N.Z., was giving his limelight entertainment, a youth attempted to show his wit and disturb the proceedings by remarking every now and again, as scenes from Ireland were being put through the slide, "I was there." Without showing the least symptom of annoyance, Mr. Mathieson threw an imposing-looking building upon the screen, and paused for his tormentor's remark. It came right enough. "I was there," said the now familiar voice. "Ladies and gentlemen," said Mr. M., "this picture represents Kilmainham Gaol, Dublin." The funny man dropped out of sight like a shot, while the audience fairly screamed with laughter. That young man will be more cautious in future before making audible remarks on similar occasions.

A MINISTER IMPROVING THE OCCASION.—There is a church in London whose rector brightens his Sunday evening services with magic-lantern slides, and who himself plays a silver trombone in the pulpit. This is the church of St. Mary-on-the-Hill, and the rector is the Rev. Wilson Carlisle. Last Sunday evening the "sheet" turned to account the inauguration of the new carriage, and entertained a vast congregation with scenes from the motor-car procession on the road to Brighton. It is a topical service, and the magic lantern utilises every passing fancy of the day before. The rector turned the point thus: "We are all oil motors. The Holy Spirit is the oil, religious enthusiasm the electric spark." Obvious comparisons were also drawn by the reverend gentleman between the faint-hearted ones, who, through mud, the gibes of the multitude, or the quality of their oil, abandoned their motors and travelled to Brighton by train, and those who are moved to abandon their spiritual path at an early stage by the sarcasm of former boon companions.

"I LIKE Alfred Maskell as I like the 'Merry Andrews' of my younger days. Not that he means to be funny, but he is so, all the same. In an article in THE BRITISH JOURNAL OF PHOTOGRAPHY, in which," says "Watchman," in the *American Amateur Photographer*, "he advances some curious reasons why painters should not be Judges at photographic exhibitions, he almost outdoes himself. Speaking of lantern slides, he says: 'It is difficult to be serious in applying the term art to those very mechanical and easily made transparencies.' It is easy—to those who know how—to make a bust in marble from the clay model furnished by the sculptor, or to print from an engraved plate of, say, the Sistine Madonna, but the results are generally regarded as works of art, for all that. Equally ludicrous, and, of course, equally amusing, are his notions of marine work. One of his proofs of the unfitness of the painters to be judges is the fact that they, or at least he thinks it must have been them, awarded prizes at a certain exhibition to 'snap-shots of smoking steamers which the rawest practitioner with a Kodak could accomplish.' What will the Wests or Adamsons say to this? It is very evident that Alfred Maskell has yet much to learn of art, slides, and snap-shotting."

MAGIC pictures, which only become visible by gradual development on the lantern screen, are made as follows: Upon a glass of the desired size, perfectly clean, we pour a solution of indiarubber in benzine, working as we should do with collodion, of a strength analogous to that of collodion. This must be allowed to dry, after which it is placed upon the design that we desire to reproduce. (There is nothing to prevent this from being a photograph.) Then, with a very fine brush, dipped in a solution of bromide of copper, we trace the design. If the lines made are very heavy, the image will be visible, and the effect will be wanting; it must therefore be done very delicately. After having outlined the image, we carefully paint the trees, foliage, grass, in a word, all the verdure, with bromide of cobalt; the sky and water must be done with a solution of acetate of cobalt, with the aid of a very soft and fine brush. We mount this as we should do an ordinary lantern slide. If the work is well done, the image ought to be entirely invisible, but, when placed in the lantern, it will gradually appear to perfection under the influence of heat. By these means may be depicted winter scenes, which under the action of the heat of the fire are transformed into scenes of summer; these return to their primitive appearance on cooling. With a little care and ordinary skill it is possible to obtain this pleasing and novel transformation with photographs.—*Post Express, Rochester, N.Y.*

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British journal of
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